

**PLANT McDONOUGH-ATKINSON**  
**CCR SURFACE IMPOUNDMENT**  
**(CCR UNIT AP-1)**  
**COBB COUNTY, GEORGIA**  
**PART B SECTION 1 – HYDROGEOLOGICAL**  
**ASSESSMENT REPORT**

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FOR



**Revision 06 – December 2023**



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## Certification

This *Hydrogeologic Assessment Report* for Georgia Power Company's (Georgia Power) Plant McDonough-Atkinson (Plant McDonough) CCR Surface Impoundment (CCR Unit AP-1) was prepared by WSP USA Inc. (WSP).

I certify that this *Hydrogeologic Assessment Report* was prepared in accordance with the Georgia Environmental Protection Division Rule (391-3-4-.10(9)(c)(6)) "Rules for Solid Waste Management, Coal Combustion Residuals."

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## 1.0 INTRODUCTION

Georgia Environmental Protection Division (GA EPD) Rule 391-3-4-.10 of the Georgia Solid Waste Management Regulations establishes a permitting program that regulates the storage and disposal of coal combustion residuals (CCR), providing requirements for operation, closure, and post closure care of CCR units in Georgia. Georgia Power Company (Georgia Power) is presenting this *Hydrogeologic Assessment Report* (HAR) to meet the requirements as specified in GA EPD Rule 391-3-4-.10(9)(c)(6) for the ash ponds at Plant McDonough-Atkinson (Plant McDonough, Site) Surface Impoundments must submit a technical report of geological and hydrogeological units within the disposal site and potentiometric map of the water table as specified in GA EPD Rule 391-3-4-.10(9)(c)(6). This report describes geologic and hydrogeologic information of Ash Pond 1 (AP-1) at Plant McDonough. AP-3 and AP-4 were historically operated together and are being closed as a Combined Unit AP-3/4, as required by 391-3-4-.10(7)(a). Ash Ponds 2 and 3/4 (AP-2 and 3/4) are located east of AP-1 and are referenced here as they relate to site conditions. Information included specific to AP-2 and 3/4 should not be considered for permitting. This report and the facility's *Groundwater Monitoring Plan* supports compliance with the CCR Rule by demonstrating that the groundwater monitoring system at Plant McDonough meets the requirements outlined in 391-3-4-.10(6) and 40 CFR § 257.91.

### 1.1 AP-1 Pond Closure

The *Closure Plan* (Golder, 2019) was prepared in accordance with 40 CFR 257, Subpart D and meets the requirements of 40 CFR 257.102(b).

The surface impoundment referred to as AP-1 at Plant McDonough has been closed in place. The closure process included placement of a permanent cover system designed to minimize infiltration and erosion and to meet or exceed the requirements of 257.102(d)(3)(ii). Maintenance will be provided on the final cover system for the required post-closure care period so that the integrity and effectiveness of the final cover system is maintained. Maintenance activities will include, as needed, repairs to the final cover to correct any effects related to settlement, subsidence, erosion or other events, and will be performed to prevent run-on or run-off from eroding or otherwise damaging the final cover.

To further enhance the in-place closure of AP-1, a subsurface perimeter barrier wall (barrier wall) is included in the *Closure Plan* as an Advanced Engineering Measure (AEM). The term AEM refers to engineering controls that are technologies or measures designed to enhance the protection of groundwater and closure effectiveness, and/or further minimize future maintenance of the unit. The proposed barrier wall will fully encircle the AP-1 footprint (as a laterally continuous feature); however, the target installation depth is under review. WSP performed a geotechnical and hydrogeological study during Spring 2023, which included five borings in the approximate footprint of the proposed barrier wall. The investigation results are presented in Appendix A and relevant text, tables, and figures of this HAR were updated to incorporate the new information.

## 2.0 BACKGROUND INFORMATION

### 2.1 Site Description and Physiography

Plant McDonough is located in southeast Cobb County, Georgia and is owned and operated by the Georgia Power Company. The property occupies approximately 390 acres and is bounded on the southeast by the Chattahoochee River. A detailed site map is included as Sheet GW-1.



The Site is located within the Piedmont Physiographic Province of central Georgia, which is characterized by gently rolling hills and narrow valleys, with locally pronounced linear ridges. Overall, the property slopes gently south towards the Chattahoochee River.

AP-1 is located in the western limits of the Site on ground topographically sloped downward to the southwest, creating an impoundment via side hill embankments constructed along the southern portions of the unit that tie into higher natural ground in the northeast quadrant of the Unit. A small unnamed creek originally flowed through the footprint of the current AP-1 area and was rerouted into an engineered stream channel that now flows to the south, parallel and adjacent to the western and southern boundary of AP-1.

AP-2 is located east of AP-1 and south of AP-3 in the center of the eastern half of the Site. The majority of CCR removal from AP-2 was completed in 2016 and remnant CCR removal from AP-2 was completed in 2019. Additional over excavation into the underlying soils creates a topographic low point.

AP-3/4 is located in a topographically high area on the property, that created a generally radial groundwater drainage downslope of AP-3/4 during impoundment operations. A small creek flows south under Plant Atkinson Road into a corrugated metal pipe (CMP) slip lined with a fiberglass reinforced plastic (FRP) stream diversion culvert, which inlets north of AP-3/4 and outlets southeast of AP-3/4.

Topographic relief near Plant McDonough ranges from less than 750 feet North American Vertical Datum 1988 (ft NAVD88) near the tributaries and river to greater than 840 ft NAVD88 near the center of the property.

## **2.2 Regional Geologic and Hydrogeologic Setting**

The following section and subsections include a general description of regional geologic and hydrogeologic characteristics of formations that occur beneath the Site. Information presented in this section is based on published literature, and discussion with local geologic experts as cited, as well as experience working in this geologic terrain. This information is intended to serve as a framework for the description of site-specific conditions presented in Section 3.0.

The Site is located within the Northwest Atlanta, GA United States Geological Survey (USGS) 7.5-minute topographic quadrangle. The Piedmont geologic province contains some of the oldest rocks in the Southeastern United States. Since their origin, approximately 276 to 1100 million years ago (Ma), these late Precambrian (Neoproterozoic) to late Paleozoic (Permian) rocks have undergone repeated cycles of igneous intrusions and extrusions, metamorphism, folding, faulting, shearing, and silicification. The latest regional metamorphism and associated deformation has been attributed to the collision of the North America plate with the Eurasian plate approximately 200 to 230 Ma. More recent deformation and emplacement of mafic dikes is associated with the rifting of the North American craton during the Mesozoic and Cenozoic Eras.

The metamorphic and igneous rocks that underlie the area have been subjected to physical and chemical weathering, which has created a landscape dissected by creeks and streams forming a dendritic drainage pattern. These rocks are deeply weathered due to the humid climate and bedrock is typically overlain by a variably thick blanket of residual soils and saprolite. The overall depth of weathering in the Piedmont geologic province is variable (Miller 1990, LeGrand 2004), with saprolite thickness reaching up to 150 feet. Because of variations in rock types and structure, the depth of weathering can vary significantly over short horizontal distances.

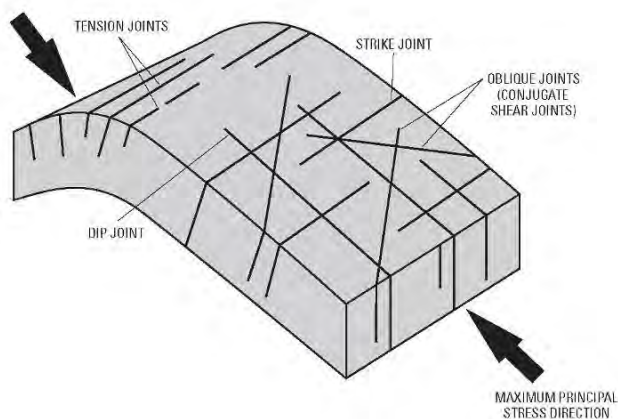


### 2.2.1 Regional Geology

The Site lies in a regional zone of deformation, referred to as the Brevard Zone, which extends from Alabama to Virginia. Lithologic contacts and major structural features in the Brevard Zone generally trend northeast-southwest. In addition to strike-slip and thrust faults, structural features within this shear zone consist of northwest-verging, doubly plunging folds that have been overprinted by a shear-induced foliation. The Centralhatchee Synclinorium is a regional fold-system that occurs within the Brevard Zone. Discrete zones of intense shearing occur within the Brevard Zone that have locally reduced the grain size of the parent rocks forming a variety of tectonic rock types, including phyllonite, button schist, and mylonitic rocks. Generally, the Brevard Zone and associated shear foliation are subparallel to compositional layering and lithologic unit contacts, with discordance of less than 10 degrees. Discordance significantly increases between the shear foliation and regional foliation in areas of fold noses and hinges.

The Brevard Fault Zone is inactive with no displacement since the Holocene. Several regionally extensive faults have been mapped near and within the Site associated with the inactive Brevard Fault Zone. An unnamed, faulted, intrusive contact traverses northeast-southwest across the Site and is observed throughout most of the metro-Atlanta area. Regionally, this appears to be a normal fault contact; however, where it is exposed and observed in core holes drilled adjacent to the contact at Plant McDonough, the fault has endured substantial movement as indicated by porphyroclastic-feldspars with sigmoidal-tails. Other regional faults characterized by near-vertical, strike-slip movement, occur north and south of the Site: the Long Island Creek Fault is located approximately one mile north of the Site; and a series of strike-slip faults that define a zone of intense shearing within the Brevard Zone occur just south of the Site. These faults were formed at significant depth within the crust, enduring intense ductile deformation while forming in a high pressure, low temperature environment.

Four main joint orientations are commonly found in folded and faulted rocks in the Piedmont Physiographic Province (see inset below). Strike joints develop parallel to the strike of bedding, foliation, and fold axes, typically forming from tension along fold hinges or due to shearing. The dip direction and angle of these joints is orthogonal to the dip direction and angle of bedding. Dip joints form parallel to bedding dip direction and are typically perpendicular to the strike of bedding and fold axes, representing extension in the maximum principal stress direction or direction of compression. These joints are commonly near vertical. Oblique joints develop diagonal ( $\pm 30^\circ$ ) to the principal stress direction and represent conjugate sets formed from shearing.



Schematic Diagram showing typical joint patterns  
(Davis, 2012)



## 2.2.2 Regional Hydrogeology

Groundwater in the Piedmont Physiographic Province (Piedmont) can occur as perched water within residual soils, as an unconfined regional aquifer within residual soils and transitionally weathered materials, and as a series of confined to semi-confined, discrete, but locally interconnected aquifer systems within the bedrock. Perched groundwater occurs above the local or regional groundwater potentiometric surface and is locally developed above lithologies with relatively lower permeability, which temporarily retard the natural downward infiltration of groundwater. This groundwater is unconfined, recharged by precipitation, and is laterally discontinuous and temporally transient.

The regional groundwater potentiometric surface is laterally consistent and generally occurs within overburden overlying less-weathered bedrock. In general, this overburden consists of residual soils and a transitionally weathered zone typical of Piedmont settings. Due to chemical weathering, saprolitic-soil retains relict structural features of the parent rock such as foliation and compositional layering while having the texture of a soil. Saprolitic rock is similar to the saprolitic soil but is less decomposed. This saprolitic material is generally more permeable than the overlying residuum, and the underlying bedrock, and serves to concentrate groundwater along a tabular zone of enhanced permeability. Although weathering generally increases porosity and permeability within this zone, some processes taking place in this zone, such as the growth of clay minerals, mineral deposition in fractures, and development of iron oxide 'hardpan,' can significantly decrease the permeability. This tabular zone of enhanced permeability is referred to as the transitionally weathered zone, which is characterized by heterogeneously interlayered, fresh to completely weathered (saprolitic) rock.

Groundwater within the overburden, which is comprised of residual soils, saprolite, and transitionally weathered rock (TWR), is generally unconfined and the surface is generally a subdued reflection of topography. In areas where bedrock is relatively shallow and when water levels are seasonally depressed, the regional groundwater potentiometric surface also occurs within the upper zones of weathered bedrock.

Bedrock aquifer systems are recharged by groundwater that is stored in the overburden. This groundwater slowly infiltrates underlying bedrock aquifer systems by moving through preferentially weathered discontinuities in the bedrock mass, such as foliation/compositional layering, joints, and faults. The occurrence and characteristics of discontinuities (size, orientation, dilation, infilling, spacing, and persistence) are dependent on the lithology of the rock and the type of stresses applied to these rocks. These discontinuities are locally enlarged along individual planes as well as at the intersection of planes due to physical and chemical weathering, providing preferential pathways for enhanced groundwater flow. Groundwater can move readily, both vertically and horizontally, through these isolated areas of enhanced porosity and permeability, and depending upon the size, concentration, and interconnection of these secondary openings, the bedrock can either be dry or host to high-yield wells (Heath, 1984).

## 3.0 SITE GEOLOGIC CONDITIONS

Site geologic conditions were evaluated through a detailed geologic mapping performed onsite and a series of subsurface boring and well data that were collected over several years. Subsurface conditions were evaluated from available boring and monitoring well installation logs. Interpretations were made, primarily related to depth to bedrock and the material that constitutes bedrock (e.g., mineralogy), considering the overall rock mass quality [e.g., rock quality designation (RQD)]. These data were used as the basis of a top of rock contour map, presented as Sheet GW-2, and for geologic cross sections, presented as Sheet GW-3a through GW-3j.



### 3.1 Geologic Mapping Methodology

Geologic mapping was performed in 2016 by Petrologic Solutions, Inc. (Petrologic) within and around the Site using the Northwest Atlanta, GA USGS 7.5-minute topographic quadrangle as a base map. Sheets GW-4 and GW-5 present interpretations of structural and lithologic features encountered during mapping of the area. Information recorded at each map station included: lithology and mineralogy; orientation and characteristics of structural discontinuities including, shearing, faulting, jointing, cleavage, and compositional bedding; and depth and type of weathering characteristics of the rock. Map station locations were chosen based on outcrop availability and recorded using a hand-held, Wide Area Augmentation System (WAAS)-enabled Global Positioning System (GPS).

### 3.2 Residual Soil and Saprolite

Boring logs indicate that residual soils, primarily clayey/sandy silt, sandy silt with clay, and silty sand (increasing with depth), occur as a variably thick deposit overlying bedrock across most of the Site, as illustrated on geologic cross sections presented as Sheets GW-3a through GW-3j oriented to the nine profile lines depicted on Sheets GW-1 and GW-1A. **Sheet GW-1B shows the wells and soil borings specific to AP-1.** Saprolitic soils range in thickness from approximately 4 to 55 feet across the Site and were generally encountered at or near ground surface. Saprolitic rock is also considered to be partially weathered rock (PWR), which is defined by Standard Penetration Test (SPT) blow counts that exceed 100 blows/twelve inches. Material overlying the top of rock surface, including residual soils, saprolite, and TWR (i.e., generalized term, not quantified through SPT), is collectively referred to as overburden or regolith in this report. The thickness of the overburden encountered in the borings is variable, ranging from a minimum of approximately 9 feet to as much as **74** feet, with an average thickness of approximately 43 feet. Thickness of TWR varied from 0.30 to 30 feet.

The criterion used for identifying top of bedrock was generally the depth at which a significant thickness of fresh, relatively competent (i.e., good overall rock mass quality) bedrock was encountered. This depth determined using professional judgement and a combination of visual observations of core, auger refusal, and drill rig response. These elevations were used to develop the top of rock contour map presented on Sheet GW-2, which shows the top of rock surface has been largely uniformly weathered and generally follows topography. The cross sections (Sheets GW-3a through GW-3j) were also used to bolster three-dimensional interpretation of the surface.

### 3.3 Lithologic Units

Based on the detailed geologic mapping, graphically represented on Sheet GW-4, the plant property is underlain by two lithological units separated by a faulted intrusive contact, which trends northeast to southwest through the Site.

The plant property northwest of the faulted contact is underlain by the following unit:

Long Island Creek Gneiss (OZli): a medium- to coarse- grained; very felsic rock that yields light-colored soil. Foliation is moderately well-developed; near faults and shear zones, the gneiss has an augen texture; locally intruded by granitic pegmatites that are commonly unsheared.

The plant property southeast of the faulted contact is underlain by the following unit:

Phyllonite, Button Schist, Mylonite, and Mylonitic Biotite Gneiss (OZbs): rocks all interlayered on a scale of inches, feet, and tens of feet. The phyllonite consists of fine recrystallized muscovite along schistosity surfaces, formed by dislocation (shearing) metamorphism. The mylonite button schist is composed primarily of fine sericite, muscovite, quartz, and feldspar; with medium- to coarse-grained muscovite forming distinctive 'eyes;' there is a well-



developed shear foliation. The mylonite is composed of sericite, quartz, and feldspar, extremely fine-grained, with a poorly developed foliation. The mylonitic biotite gneiss is composed primarily of biotite, quartz, and feldspar, very fine-grained, with a well-developed shear foliation.

### **3.4 Geologic Structure**

#### **3.4.1 Foliation and Faults**

One of the most pervasive structural features of the Brevard Zone is the presence of a well-developed shear foliation. Regional foliation is also observed at the Site; the intersection of regional and shear foliation locally creates shear fabrics such as button-shaped mica in schists. Bedrock discontinuity orientations were analyzed using lower hemisphere equal area stereonet, presented as Sheet GW-5, to determine dominant orientations for each discontinuity type (i.e., joints, foliation, and layering). One domain of foliation was observed on site during geologic mapping, the property is characterized by foliation that strikes generally northeast-southwest. Equal-area, lower-hemisphere stereonet analyses of the foliation measurements for this domain has an average pole concentration representing a foliation of N44°E, dipping 42° to the southeast.

At Plant McDonough, the measured geologic strike of foliation, formation contacts, and mapped faults and fold axes observed in the rock outcrops of biotite gneiss and mica schist mapped at the Site ranges from N42°-57°E. Dip joints should be perpendicular to local geologic strike and oblique conjugate joint sets should be +/- 30° from the dip joint direction.

#### **3.4.2 Joints**

Because the evaluation of joints is visual and judgmental, an effort is made for consistency in describing the relative frequency of occurrence using the following designations: Abundant (A); Common (C); and Scarce (S). These designations are relative to one another but are used consistently in descriptions made throughout the study area. An effort is made to record all of the different joint sets and, if an exposure is large, several same (or similar) joints may be recorded at the same map station. This deliberate method of visual evaluation in the field is more scientifically relevant and efficient than saturation-measurement of joints.

Joints within the Brevard Zone are common and persistent in most of the rock types. The joints are generally spaced on the order of a few inches to a few feet; however, there are more massive parts of various rock units which have a wider joint spacing. Joint sets in units outside of the Brevard Zone are variably developed, largely dependent upon the lithologic character of the unit.

The dominant joint set observed on site is oriented northwest-southeast and represents the strike joint. As shown on Sheet GW-5, the average strike and dip of this joint set (Jmax) is N41°W, 63°SW (azimuth 221°/63°). Four other joint sets were recorded during the detailed geologic mapping. Equal area stereonet analysis of all joints measured in all lithologies is presented in Sheet GW-5.

- 1) N34°E 75°NW (214°/75°) – strike joint (J1)
- 2) N68°W 77°NE (292°/77°) – dip joint (J2)
- 3) N29°W 78°NE (331°/78°) – dip joint (J3)
- 4) N54°W 70°SE (126°/70°) – dip joint (R1)

Locally, some of the joints contain clay infilling; however, most of the joints do not contain any infilling in surface exposures. The plane-surface morphology of each joint was noted in the field descriptions. Most of the joints are planar and smooth with little to no evidence of high fluid flow except in the mylonitic biotite gneiss units.

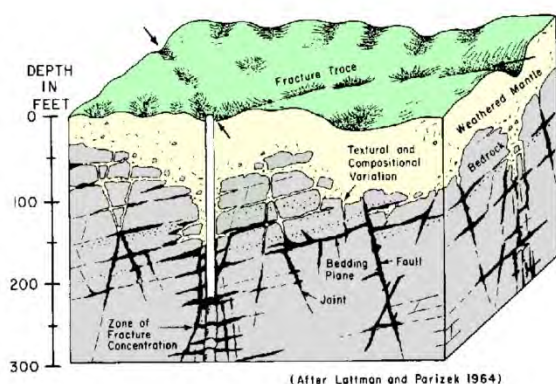


## 3.5 Lineament Analysis

### 3.5.1 Methodology

Subsurface geologic discontinuities such as lithologic contacts between resistant or non-resistant units, fracture zones, jointing, shear planes, and faults often have ground surface expressions that can be identified through analysis of photographic and topographic images. The discontinuities expressed as lineaments at ground surface commonly have enhanced porosity and permeability in the rock mass due to differential weathering. Groundwater in igneous and metamorphic rocks generally moves along discontinuities in the bedrock, enhancing the differential weathering processes.

Because discontinuity zones are typically less resistant to weathering, they are often expressed as natural topographic lows, such as straight stream valley segments, swales, aligned depressions and gaps in ridges or as linear tonal or vegetative alignments due to variations in soil thickness and moisture (see inset). These surface manifestations are referred to as fracture traces or lineaments and were identified for this project by remote-sensing techniques using topographic maps, aerial photographs, and shaded relief maps generated from 10-meter Digital Elevation Model (DEM) data.



Inset - Block diagram shows how lineament/fracture trace is a surface manifestation of an underlying bedrock fracture zone. (Lattman and Parizek, 1964)

Lineament analyses were conducted on USGS topographic maps, USGS DEMs, and USGS low-altitude aerial photographs (verified with National High-Altitude Photography Program (NHAP) high-altitude aerial photographs). Linear features or linear groups of features were identified and traced on digital overlays of the maps, presented as Sheet GW-6. Lineaments arise from a number of sources. Many lineaments observed on the small-scale imagery or maps are related to fence, property, and section lines. However, many lineaments are related to local and regional geologic anomalies. Rectilinear segments of streams may be associated with local weakness in the underlying bedrock related to persistent joint sets. Faults tend to be long linear features that are often difficult to detect at ground surface, but generally form photographic and topographic lineaments.

### 3.5.2 Discussion of Lineaments

Based on a total of 296 lineaments identified on the topographic maps, low and high-altitude aerial photographs, and DEM, two major groups of lineament orientations were identified within and around the Site by the lineament analyses and both are consistent in orientation with measured discontinuities in the bedrock (Sheet GW-6):

- L<sub>1</sub>: N40° to 60°W – perpendicular to foliation strike
- L<sub>2</sub>: N30° to 60°E – parallel to foliation strike



Lineament orientations appear to correlate with mapped regional and local tectonic fabrics suggesting that they originate as bedrock fracture concentrations and are likely actual manifestations of subsurface fracture zones or possibly low-resistant stratigraphic layers or shear zones within the rock formations underlying the study site. Such structural weaknesses in rocks are reflected by the fractures formed, which subsequently can be weathered to form lineaments.

### 3.5.3 Discontinuity Mapping and Lineament Analysis Correlation

Lineaments identified are considered to be the ground-surface expression of preferential weathering related to discontinuities in rock. Sheet GW-6 shows a comparison of measured discontinuities and lineaments for this study. Based on this evaluation, the project area appears to be characterized by two persistent lineament sets whose orientations are consistent with the structural stresses experienced in this area. It appears that  $L_1$  is related in orientation to the dip joints and dip direction of the northeast-trending foliation;  $L_2$  is related in orientation to the strike joint and strike direction of the northeast-trending foliation as well as the orientation of the fault intrusive contact. Although counterintuitive to predicted patterns of  $L_1$  being strike parallel as is common in the Brevard Zone and throughout the Piedmont, it is possible that given the study area is highly developed, remaining exposures may bias the count in the dip direction.

The orientation of these discontinuities forms a classic joint pattern that develops in rock formations in the Piedmont due to compressional stress (Heath, 1984; Jennings, 2010). Because lineament orientations correlate with known regional tectonic fabrics, it is likely that most are true manifestations of subsurface fracture zones or low-resistance stratigraphic layers within the rock formations underlying the Site.

## 4.0 CONCEPTUAL SITE HYDROGEOLOGIC MODEL

### 4.1 Uppermost Groundwater Aquifer

Boring logs and monitoring well/piezometer installation logs were used to evaluate hydrostratigraphy of the Site. Piezometers at the Site have been used for water level measurements and enhance the understanding of site hydrogeology. Material types identified included residual soils, saprolitic soils, saprolitic rock (or PWR if blow counts were provided), TWR, and competent bedrock. Based on review of the logs, the screen/filter pack interval for most of the piezometers and monitoring wells installed on site provides connection to the overburden, indicating that the Site is underlain by a regional groundwater aquifer that occurs within the overburden and upper bedrock depending on topographic location.

According to water level measurements recorded between August 2016 and January 2023 from wells and piezometers screened in the overburden and upper bedrock, the water table elevation ranges between approximately 834 ft NAVD88 at upgradient well DGWA-71 to approximately 745 ft NAVD88 at downgradient piezometer B-62. These data are summarized in Table GW-1. The depth to saturation varies from approximately -1.6 to 46.4 feet below ground surface (ft bgs) across the Site and is variable with lithology (Table GW-1). Depth to saturation ranged from approximately 2.5 to 42.6 ft bgs and 0.9 to 46.4 ft bgs in the OZli and OZbs formations, respectively. The geometric mean of depth to saturation data was similar in both formations.

Localized groundwater flow directions within this aquifer are influenced by topographic and top of rock variations on site. As illustrated on the Geologic Cross-Section Schematics shown on Sheets GW-3a through GW-3j and the January 31, 2023, Potentiometric Surface shown on Sheet GW-7, the water table surface is a subdued reflection of topography at the Site, with groundwater generally flowing towards the south and west of the ash ponds. As discussed in Section 3.2, the top of rock surface also generally follows topography and likely controls groundwater flow direction in the uppermost aquifer. Local complexities in groundwater flow within this aquifer are influenced



by topographic and related top of rock variations on site. AP-3/4 is on a topographic high, creating radial flow around the ponds, with the exception of the one upland high upgradient northwest of AP-3/4. As a result of localized dewatering activities, groundwater flow in the northeast portion of AP-3/4 is inward toward the ash pond. AP-2 has a side-hill embankment, 16 feet high with an original pond area of 7 acres. Regionally groundwater is interpreted to flow south-southeast from the topographic high northwest of AP-3/4 towards AP-2. The groundwater flow pattern interpreted using the January 2023 elevation data is consistent with previous observations.

## 4.2 Groundwater Flow

Relatively thick silt/clay-rich overburden is present across most of the Site which may retard recharge from the uppermost aquifer into the underlying bedrock aquifer systems. Additionally, boring logs indicate that some areas, particularly topographic highs, correlate with bedrock that is resistant to weathering and massive (i.e., few discontinuities); consequently, bedrock aquifer systems are likely not well-developed and/or interconnected in these areas. Preferential groundwater flow in bedrock is anticipated along lineaments and discontinuities. The faulted intrusive contacts in and around the Site may also be preferential flow pathways; however, no evidence obtained to date indicates preferential flow along the faulted intrusive contact onsite.

The Long Island Creek Gneiss that occurs north of the fault generally does not transmit groundwater to water supply wells in the region. This unit may locally function as an aquitard (i.e., hydrogeologic barrier) that limits groundwater flow in the bedrock aquifer. Regionally, it is understood that this unit generally does not form productive bedrock aquifer systems and rate of infiltration is relatively slow (Miller, 1990).

It is expected that a significant amount of groundwater flow occurs in the residual soils, saprolite, and TWR/PWR - i.e., overburden. This is typical of the Piedmont, as discussed in Fetter (1988). The significance of groundwater flow between the overburden and upper fractured bedrock is dependent on the degree of hydraulic connectivity between the units. Generally, the majority of groundwater flow across the Site occurs laterally in the overburden. Based on site-specific hydrogeologic characteristics, groundwater is expected to move laterally more than vertically within the TWR/PWR unit.

Based on available boring logs for wells screened in the upper bedrock, the upper 30 feet of bedrock are fractured and appear to conduct groundwater horizontally on the same order of magnitude as the overburden. The upper bedrock appears to be connected hydraulically with the overburden. Groundwater elevations in these wells reflect topographic and weathering effects (e.g., depth to bedrock variations), and groundwater flow that is predominately lateral rather than vertically through the aquifer. The vertical hydraulic gradient is dependent on topographic location (e.g., a downward vertical gradient is generally observed in topographically high areas).

Based on drilling at the Site, borings completed deeper in the bedrock aquifer (i.e., greater than 30 feet into the bedrock unit) exhibit minimal and likely isolated fractures. The occurrence and water production of fractures generally decreases with depth as is typical of Piedmont hydrogeologic settings. Therefore, it is anticipated that there is minimal connectivity between the overburden and the deeper bedrock hydrogeologic unit.

Data from several borings drilled into deeper bedrock during delineation activities at the Site confirm that fractures within the bedrock are limited and decrease in number and groundwater production with depth, supporting the above statement. Specifically, site borings B-103D, B-122D and B-123D were installed to vertically delineate constituents in areas where bedrock was approximately 70 feet below ground surface (bgs) and therefore were installed to capture groundwater flow from bedrock fractures. Groundwater monitoring wells were screened across available fractures and do not produce sufficient water for proper development or sampling.



Site geophysical logs and groundwater monitoring data at B-123D confirm that the deeper fractures produce less than 0.025 milliliters per minute. This flow rate does not constitute groundwater in an “aquifer” but rather limited groundwater movement within the deeper bedrock unit.

Based on these site-specific examples and supporting data, fractures within the bedrock at the Site are not well connected and the predominant groundwater flow at the Site occurs in the overburden and upper bedrock at the Site. Several references to published work within the Groundwater Monitoring Plan (GWMP) were reviewed and confirm these observations made at the Site are consistent with Piedmont geology.

Based on these interpretations, groundwater located on the upland high west of the engineered stream channel located on the west boundary of AP-1 is considered upgradient of the plant property. This upland area and the upland high northwest of AP-2 and AP-3/4 represent the only upgradient locations on the property near the units with the current pond configuration. It is anticipated that as water continues to be pumped from AP-3/4, portions of the northern and northeastern corner of the property will become upgradient over time, returning to the historical regional groundwater flow pattern, corresponding to historical pre-ash pond construction regional topography.

Based on review of the potentiometric contours (Sheet GW-7), horizontal hydraulic gradient is also variable and reflects topography at the Site. The horizontal gradient appears steeper around the downgradient perimeter of the ash ponds, particularly along embankments where groundwater flow lines are influenced by the constructed slopes for the impoundment dams. Hydraulic gradient is calculated as the difference in groundwater elevation (in feet) divided by the distance between two piezometers or wells (in feet).

January 2023 groundwater elevation data from six piezometer and/or monitoring well pairings located along the groundwater flow path and perpendicular to the potentiometric contours were used to calculate horizontal hydraulic gradients for AP-1 and AP-2, 3/4. As shown on Table GW-2, hydraulic gradients in January 2023 were calculated as follows; B-29/DGWC-68A (0.037 ft/ft), B-28/DWGC-37 (0.019 ft/ft), and B-50/DGWC-39 (0.024 ft/ft) for AP-1 and DGWA-53/DGWC-13 [0.029 feet/feet (ft/ft)], and B-26/DGWC-48 (0.026 ft/ft) for AP-2, 3/4. Overall average hydraulic gradients for AP-1 and AP-2 and 3/4 derived using these horizontal gradients are 0.027 ft/ft and 0.028 ft/ft, respectively.

Field hydraulic conductivity tests (i.e., slug tests) performed in a variety of geologic materials indicate an average hydraulic conductivity for the uppermost aquifer of  $3.45 \times 10^{-4}$  centimeters per second (cm/s);  $4.9 \times 10^{-4}$  cm/s in the overburden and  $2.0 \times 10^{-4}$  cm/s in the upper bedrock, respectively (Table GW-3). Plotting site gradation data (SCS, 2013) on a soil classification-specific yield triangle (Johnson, 1967) indicates that a majority of the soil samples plot in the silty sand classification with effective porosities ranging from 15% to 25%. Assumed effective porosity of 20% for overburden was used based on the default values for effective porosity recommended by USEPA for a silty sand-type soil (USEPA, 1996). An assumed effective porosity of 9% was used for bedrock (Daniel and Dahlen, 2002; Dowd and Marshall, 1995).

A horizontal flow velocity range was calculated for the overburden and upper bedrock using several hydraulic gradients throughout the Site and average site hydraulic conductivity values from field hydraulic conductivity tests.

Horizontal flow velocity was calculated using the common derivative of Darcy's Law:



$$V = \frac{K * i}{n_e} \quad \text{Where:}$$

$V$  = Groundwater flow velocity  $\left( \frac{\text{feet}}{\text{day}} \right)$   
 $K$  = Average hydraulic conductivity of the aquifer  $\left( \frac{\text{feet}}{\text{day}} \right)$   
 $i$  = Horizontal hydraulic gradient  $\left( \frac{\text{feet}}{\text{feet}} \right)$   
 $n_e$  = Effective porosity

Using this equation, groundwater flow velocities were calculated for AP-1 and AP-2, 3/4 using January 2023 groundwater elevation data. Table GW-2 presents the velocities calculated using groundwater elevation data from the January 2023 sampling event.

Calculated (horizontal) flow velocities range from approximately 77 feet per year (ft/yr) to 145 ft/yr in January 2023. These estimated flow velocities are consistent with past results and are also generally consistent with other published velocities for regolith-upper bedrock aquifers of the Piedmont (Heath, R.C., 1984).

### Vertical Hydraulic Conductivity

Hydraulic Conductivity zone values used for groundwater modeling at Plant McDonough are summarized below in Table 4.2.1.

**Table 4.2.1: Model Hydraulic Conductivity**

Zone	Layer	Hydraulic Conductivity (ft/day)	Source
Ash	1	0.55 (horizontal) 0.037 (vertical)	AP-3/4 CPT dissipation and aquifer testing data (Golder, 2020)
Overburden	1&2	0.70 (horizontal) 0.14 (vertical)	Historical Slug testing (Golder, 2020)
PWR	3	0.2 (horizontal) 0.02 (vertical)	Model Calibration
Bedrock	4	0.16 (horizontal) 0.016 (vertical)	Model Calibration

Notes:

1. ft/day – feet per day
2. Assumed hydraulic conductivity vertical anisotropy ratios ( $K_{xy}/K_z$ ) varied between 5 and 15, which is typical for unconsolidated residuum and alluvial aquifers (Bendient et al., 1994).

The layer 1 areal zone extent varies between models. Conductivity zones include:

- Ash: Limited to within footprint of ash ponds
- Overburden: Includes northern portion of AP-1 and fringes of AP-1 and AP-3/4 in Layer 1 and all of Layer 2.
- PWR: Includes all of model layer 3.
- Bedrock: Includes all of model layer 4.

No site specific vertical hydraulic conductivity measurements have been completed. Vertical hydraulic conductivities in the groundwater model are defined based on typical ratios with measured horizontal hydraulic conductivities for the Site.

## 4.3 Conceptual Site Hydrogeologic Model Summary

A regional, unconfined aquifer system is present at the Site, which consists of residual soils and TWR – i.e., overburden. Interconnected fractures in the transition zone transmit groundwater stored in the overburden soils to



underlying bedrock, following the conceptual model for groundwater flow in the Piedmont (LeGrand, 2004). The water level trends noted at the Site are comparable to similar hydrogeologic settings in the Piedmont region of southeastern US (e.g., Chapman et al., 2007). Additionally, the relationship between groundwater levels and the Site topography is consistent with the slope-aquifer conceptual model for groundwater flow in the Piedmont (Robinson et al., 1996; LeGrand, 2004). Other attributes of the site-specific hydrogeologic model include:

- 1) The Site is directly underlain by a variably thick blanket of overburden (approximately 9 to 65-feet thick), which is comprised of residual and saprolitic soils, saprolitic rock, PWR, and TWR. Based on field hydraulic conductivity tests, the overburden is estimated to have an average horizontal hydraulic conductivity of  $10^{-4}$  cm/sec.
- 2) Bedrock north of the faulted intrusive contact is primarily characterized as Ordovician age Long Island Creek Gneiss (Ozli), which is described as felsic sphene-epidote-biotite-quartz-feldspar gneiss with well-developed foliation and an augen texture reflecting historical movement/deformation near fault and shear zones of the inactive Brevard fault zone. South of the faulted intrusive contact is primarily characterized by interlayered Ordovician age phyllonite, button schist (OZbs) with well-developed shear foliation, fine-grained mylonite with poorly developed foliation, and very fine-grained mylonitic biotite gneiss with well-developed shear foliation.
- 3) Two lineament sets (i.e., L<sub>1</sub> and L<sub>2</sub>) were identified onsite that orientations are consistent with the structural stresses experienced in this area.
- 4) The top of rock surface and water table generally mimic site topography.
- 5) The uppermost aquifer occurs within the overburden and upper bedrock at the Site. According to water levels measured from August 2016 to January 2023 from wells and piezometers screened in the overburden and upper bedrock, the depth to saturation varies from approximately -1.6 to 46.4 ft bgs across the Site and is variable with topography (Table GW-1). Calculated geometric means for depth to saturation were similar in both formations. The deeper (i.e., greater than 30 feet) in the bedrock aquifer is generally massive in nature with few, low-yield and isolated fractures, with both the occurrence and water production decreasing with depth. Consequently, groundwater flow within the uppermost aquifer is anticipated to occur primarily along the TWR zone, which is located at the interface between the overburden residual soils and massive bedrock, and upper bedrock. It is anticipated that there is minimal connectivity between the overburden and the deeper bedrock hydrogeologic unit.
- 6) The potentiometric surface for the uppermost aquifer indicates groundwater flows generally west south-west across AP-1.
- 7) Across the Site, vertical gradients are expected to occur downward in topographically highs and upwards near topographic lows.

## 5.0 THREE-DIMENSIONAL NUMERICAL GROUNDWATER MODEL

A three-dimensional (3-D) numerical groundwater model was developed to compare closure conditions to Pre-Closure-August 2016 conditions. Model input files were created using a combination of Environmental System Research Institute ArcMap 10.4.1 and the Environmental Simulations Inc. Groundwater Vistas 7 (GV) graphical user interface. A steady state groundwater flow model was developed using the MODFLOW-NWT finite difference model code (Niswonger, Panday, & Ibaraki, 2011), which is an enhanced version of the MODFLOW code (McDonald & Harbaugh, 1988). Model construction, calibration, and results are described in the Three-



Dimensional Numerical Groundwater Modeling Summary Report (WSP, 2023a; Appendix B) and the Three-Dimensional Numerical Groundwater Modeling Summary Report Addendum (Golder, 2021a; Appendix B).

At the time of model development, groundwater data only includes data measured up to August 2016. As such, calibration and development of this model utilizes the August 2016 dataset. The model simulates groundwater flow from the northwest corner to the south and southeast across the plant property with groundwater discharging at modelled boundary conditions. Modelled simulated groundwater flow patterns are consistent with the conceptual model of groundwater flow for the Site. The model summary addendum (Golder, 2021a) presents an update to the steady state numerical groundwater flow model. Specifically, the addendum documents revised post-closure groundwater flow model predictions based on updates to the AP-1 closure-by-removal area grading and subsurface barrier wall alignment.

The perimeter barrier wall proposed for Plant McDonough CCR Unit AP-1 as part of the advanced engineering methods will create a flow path barrier for lateral flow at AP-1. Per the groundwater modeling conducted comprehensively, while the water levels may fluctuate temporarily as a result of the installation of the AP-1 barrier wall, water levels at Combined CCR Unit AP-3/4 are not expected to be affected. Groundwater modeling results included in Appendix A of the HAR reflect closure scenarios for CCR Unit AP-3/4 including the installation of a perimeter barrier wall at AP-1, and ultimately reflect steady state post-closure groundwater levels below CCR at AP-3/4.

## 6.0 WELL NETWORK DESIGN

Two groundwater monitoring systems at the Site were designed and installed to accurately represent the quality of background groundwater and groundwater passing the waste boundaries of the AP-1 and AP-2, 3/4 CCR units. For the purpose of this HAR, AP-2, 3/4 CCR units network information is presented for informational purposes only and should not be considered for permitting. Georgia Power follows the recommendations as stated in Chapter 2 of the Manual for Groundwater Monitoring (GA EPD, 1991) to establish well spacings based on site-specific conditions. The monitoring wells are located and installed near the approximate pre-closure ash limits to yield groundwater samples representative of conditions in the uppermost aquifer that:

- Accurately represent the quality of background groundwater not affected by the waste management units (CCR units) and
- Accurately represent the quality of groundwater passing the limits of the CCR units. The downgradient monitoring systems installed at the waste boundary provide early detection of potential releases from the waste units to the uppermost aquifer.

The number, spacing, and depths of the groundwater monitoring systems were determined in accordance with 40 CFR 257.91(b) and based upon site-specific technical information that included a thorough characterization of:

- 1) Aquifer thickness, groundwater flow rate, groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow and
- 2) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the lower boundary of the uppermost aquifer, including, but not limited to, thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.



Site-specific well siting factors that were considered when developing the proposed groundwater monitoring networks include:

- 1) Groundwater conditions within saprolite and the TWR zone are comparable to conditions within the residual soil and are therefore included in the hydrostratigraphy identified for the uppermost aquifer, collectively referred to as overburden.
- 2) The uppermost aquifer generally occurs within the overburden and is connected with more fractured portions of the upper bedrock beneath the Site depending on topographic location; such that the upper 30 feet of bedrock is appears to transmit groundwater horizontally on the same order of magnitude as the overburden.
- 3) Significant amount of groundwater flow is expected to occur in the overburden, which is typical of the Piedmont as discussed in Fetter (1988), with the majority of groundwater flow occurring laterally in the TWR zone. The significance of groundwater flow between the overburden and fractured bedrock is dependent on the degree of hydraulic connectivity between the units.
- 4) Based on site-specific hydrogeologic characteristics, groundwater is expected to move laterally more than vertically within the upper aquifer, it is likely that there is limited amount of aquifer recharge occurring into deeper bedrock in and around the Site.
- 5) Consistent with regional gradients, the potentiometric surface of the uppermost aquifer is generally south-southeast to southwest from AP-3/4 towards AP-2. Localized groundwater flow directions within this aquifer are influenced by topography and top of rock variations on site.
- 6) Lithologic variations in bedrock are anticipated to have variable geochemistry and different weathering characteristics. Overburden material is likely to represent variable geochemistry of the underlying parent rock.
- 7) Careful consideration was given in defining areas that represent upgradient and downgradient conditions at the Site with regard to the anticipated potentiometric surface, site geology, and the structures that will require monitoring, with some local mounding anticipated to occur near the ponds. Groundwater flow patterns are expected to change with diminishing water levels in AP-3/4; eventually returning to a pattern that generally reflects original site topography (southward).

In summary, well locations are based on a robust dataset and the Site conceptual model for groundwater flow at the Site. Well locations were selected based on subsurface conditions and localized geologic and hydrogeologic conditions.

Based on these considerations, a monitoring well network was developed for each of the CCR units at the Site. Groundwater monitoring wells have screens positioned in the upper portion of the uppermost water-bearing zone, as well as in the underlying and hydraulically connected bedrock zone. The monitoring well networks for each of the CCR units are described in more detail below. Driller's surety bonds can also be viewed in Appendix C and well logs for each of the Site borings, monitoring wells and piezometers can be viewed in Appendix D.

## 6.1 AP-1 Network

The AP-1 detection monitoring well network consists of eleven groundwater monitoring wells (Table GW-4). Three (3) background wells (DGWA-53, DGWA-70A, and DGWA-71) are positioned on topographic highs and are considered to represent an upgradient (i.e., uninfluenced) position relative to AP-1. DGWA-53 and DGWA-71 are



located north of AP-1 and provide background data for the OZli unit. DGWA-70A is located on a topographic high west of AP-1 and provides background data for the OZbs unit.

The general direction of groundwater flow across AP-1 is to the west-southwest. Eight monitoring wells are positioned downgradient of AP-1 (DGWC-37, DGWC-38, DGWC-39, DGWC-40, DGWC-67, DGWC-68A, DGWC-69, and DGWC-121). The downgradient wells are placed as close to the approximate pre-closure ash limits as was practical and, based on groundwater contours, and at a point where a release would be detected.

The static groundwater level measured across the Site was between approximately -1.6 and 46 ft bgs between August 2016 and **January 2023**. As described above, the uppermost aquifer generally occurs within the overburden and is connected with more fractured portions of the upper bedrock beneath the Site depending on topographic location. The AP-1 groundwater monitoring wells have a total depth ranging from 21.2 to 59.3 ft bgs and were constructed with 10-foot screened intervals so that the top of the screen is located beneath the seasonal low water table to ensure adequate monitoring of the upper aquifer. Well construction details are provided in Table GW-4.

## 6.2 AP-2, and Combined Unit AP-3/4 Network

For the purpose of this HAR, AP-2, 3/4 network information is presented for informational purposes only and should not be considered for permitting. The AP-2, 3/4 detection and assessment monitoring well networks are presented because data are relevant to the site hydrogeology. AP-2, 3/4 monitoring network consists of twenty-three (23) groundwater monitoring wells (Table GW-4). The three (3) background wells described above (DGWA-53, DGWA-70A, and DGWA-71) were integrated into the AP-2, and AP-3/4 network based on the following rationale: DGWA-53 and DGWA-71 are located north-northwest of AP-2, 3/4 and hydraulically upgradient of AP-3/4 towards AP-2, based on the interpreted groundwater flow direction to the south-southeast across the Site; and, DGWA-70A is located on the topographic high southwest of AP-2, 3/4 and hydraulically upgradient at the topographic high west of the engineered stream channel situated southwest of AP-2, AP-3/4.

Twenty (20) wells (DGWC-2, DGWC-4, DGWC-5, DGWC-8 through DGWC-15, DGWC-17, DGWC-19 through DGWC-23, DGWC-42, DGWC-47, and DGWC-48) were positioned in each direction (north, south, east, and west) downgradient of AP-2, 3/4 in both geologic units. AP-3 and AP-4 were historically operated together and are being closed as a Combined Unit AP-3/4. A multi-unit monitoring network was installed along the boundary of the farthest downgradient unit to monitor AP-2 and Combined Unit AP-3/4. The downgradient wells were placed as close to the approximate pre-closure ash limits as was practical.

The AP-2, 3/4 groundwater monitoring wells have a total depth ranging from 25.1 to 69.0 ft bgs and were constructed with 10-foot screened intervals so that the top of the screen is located beneath the seasonal low water table to ensure adequate monitoring of the upper aquifer. Well construction details are provided in Table GW-4.

## 7.0 GROUNDWATER MONITORING STATUS

Groundwater monitoring has been initiated for AP-1 CCR Units to meet USEPA and GA EPD requirements and in accordance with the *Groundwater Monitoring Plan* (WSP, 2023b). Activities for background monitoring and the initial detection monitoring were performed at Plant McDonough from August 2016 through June 2019.

Groundwater monitoring and reporting for Plant McDonough were performed in accordance with the requirements of 40 CFR § 257.90 through 257.91 and § 257.93 through 257.98 of the USEPA CCR rule. Statistical evaluation of the groundwater monitoring data for AP-1 and AP-2, 3/4 identified statistically significant increases (SSIs) and



statistically significant levels (SSLs) of Appendix III and IV groundwater monitoring parameters, respectively. An Assessment of Corrective Measures has been initiated for the Site and a *Draft Remedy Selection Report* has been submitted to GA EPD (WSP, 2023c). Monitoring results have been documented in Semi-Annual and Annual Groundwater Monitoring and Corrective Action Reports, prepared for AP-1, and AP-2, AP-3/4 (recent reports submitted to GA EPD, WSP, 2023d). These reports have been submitted to EPD and posted to the Site's CCR compliance website.

## 8.0 REFERENCES

References listed below may not be directly cited in the above text if used indirectly for report development.

Bendient, P.B., Rifai, H.S., and Newell, C.J. (1994) *Ground Water Contamination*. Prentice-Hall, Englewood Cliffs, New Jersey.

Chapman, M., M. Schlegel, B. A. Huffman, and K. B. McSwain, 2007, Hydraulic Gradients in Recharge and Discharge Areas and Apparent Ground-Water Age Dates from the Characterization of Multiple Regolith-fractured bedrock ground-water research stations in North Carolina, *Proceedings of the 2007 Georgia Water Resources Institute Proceedings held March 27-29, 2007, at The University of Georgia, Athens*.

Davis, G.H., S.J. Reynolds, and C. Kluth, *Structural Geology of Rocks and Regions* (3rd Ed.); John Wiley and Sons, Inc., New York, New York. 864 pp. 2012.

Daniel, C.C., P.R Dahlen, *Preliminary Hydrogeologic Assessment and Study Plan for a Regional Ground-Water Resource Investigation of the Blue Ridge and Piedmont Provinces of North Carolina*, U.S. Geological Survey Water-Resource Investigation Report 02-4105, July 1, 2002.

Dowd, J.F. and Marshall, J.E., Recharge to High Yield Wells in the Piedmont. *Proceeding of the 1995 Georgia Water Resources Conference held April 11-12, 1995, at The University of Georgia, Athens*.

Fractured Bedrock Ground-Water Research Stations in North Carolina. *Proceedings of the 2007 Georgia Water Resources Conference* held March 27–29, 2007, at The University of Georgia, Athens, Georgia.

Fetter, C. W., 1988, *Applied Hydrogeology*.

Georgia EPD (GA EPD), 1991. Georgia Environmental Protection Division, Georgia Department of Natural Resources, *Manual for Groundwater Monitoring*, July 1991.

Golder, 2017a, *Installation Report for Surface Impoundment Groundwater Piezometers – Georgia Power Plant McDonough, Smyrna, Georgia, B-Series Wells and Piezometers (B-47 through B-51) – December 2017*

Golder, 2017b, *Installation Report for Surface Impoundment Groundwater Piezometers – Georgia Power Plant McDonough, Smyrna, Georgia, B-Series Wells and Piezometers (B-52 through B-63) – December 2017*

Golder, 2018a, *Installation Report for Surface Impoundment Groundwater Piezometers – Georgia Power Plant McDonough, Smyrna, Georgia, B-Series Wells and Piezometers (B-67 through B-71) – January 2018*

Georgia Power, 2019. *Amended Written Closure Plan 40 CFR 257.102, Plant McDonough Ash Pond 1*, April 2019.

Golder, 2018b. *Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-2, Combined CCR Unit AP-3/4), Cobb County, Georgia Part A Section 6- Groundwater Monitoring Plan*. November 2018



Golder, 2018c. Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-1) Cobb County, Georgia Part A Section 6- Groundwater Monitoring Plan. -November 2018

Golder, 2020a. Three-Dimensional Numerical Groundwater Modeling Summary Report, Georgia Power- Plant McDonough, Cobb County, Georgia, Golder Associates Inc., Rev 05, October 2020.

Golder, 2020b. Well Installation and Design Report – Addendum, Georgia Power Company-Plant McDonough-Atkinson, Ash Pond 2 and 3/4, Golder Associates Inc., Revised September 2020

Golder 2021a. Three-Dimensional Numerical Groundwater Modeling Summary Report Addendum, Georgia Power – Plant McDonough, Cobb County, Georgia, Golder Associates Inc., November 22, 2021.

Golder, 2022a. Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-2, Combined Unit AP-3/4) Cobb County, Georgia, Part A Section 8 – Post Closure Plan, July 2022.

Heath, R.C., 1984., Ground-Water Regions of the United States: U.S. Geological Survey Water-Supply Paper 2242, 78 p.

Jennings, S. P., 2010, Assessment of the Hydrogeology of the Piedmont, Alabama, Area, Geological Survey of Alabama.

Johnson, A. A., 1967, Specific Yield – Compilation of Specific Yields for Various Materials, Geologic Survey Water Supply Paper 1662-D.

Lattmon, L.H. and R.R. Parizek. 1964. Relationship Between Fracture Traces and the Occurrence of Groundwater in Carbonate Rocks. *Journal of Hydrology* 2:73-91

LeGrand, Sr., H. E., 2004, Master Conceptual Model for Hydrogeological Site Characterization in the Piedmont and Mountain Region of North Carolina: A Guidance Manual.

McDonald, M. G., & Harbaugh, A. W., Chapter A1, 1988, A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model. In *Techniques of Water-Resources Investigations of the United States Geological Survey* (p. 586). Washington: United States Geological Survey Printing Office.

Miller J. A., 1990, Ground Water Atlas of the United States: Alabama, Florida, Georgia, and South Carolina. US Geological Survey Hydrologic Investigations Atlas 730-G.

Niswonger, R. G., Panday, S., & Ibaraki, M., MODFLOW-NWT, 2011, A Newton Formulation for MODFLOW 2005: U.S. Geological Survey Techniques and Methods 6-A37. Reston, Virginia: United States Geological Survey.

Northwest Atlanta, GA USGS 7.5-minute topographic quadrangle – 2014

Robinson, J. L., Journey, C. A., Atkins, J B, 1996, Ground-Water Resources of the Coosa River Basin in Georgia and Alabama - Subarea 6 of the Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa River Basins, USGS Report 96-177.

Southern Company Services (SCS), 2013, Plant McDonough – Historical Site Borings

US EPA, 1996, *Soil Guidance Manual*.

**WSP, 2023a.** Three-Dimensional Numerical Groundwater Modeling Summary Report, Georgia Power- Plant McDonough, Cobb County, Georgia, Golder Associates Inc., **Rev 06, November 2023.**



WSP, 2023b. Groundwater Monitoring Plan, Plant McDonough-Atkinson Ash Pond 2 and 3/4, WSP USA Inc., November 2023.

WSP 2023c. Draft Remedy Selection Report, Georgia Power Company - Plant McDonough-Atkinson Ash Pond 2 and 3/4, WSP USA Inc., August 31, 2023

WSP 2023d. 2022 Annual Groundwater Monitoring & Corrective Action Report, Georgia Power Company – Plant McDonough-Atkinson Ash Pond 2 and 3/4, WSP USA Inc., July 28, 2023.

WSP 2023e. Perimeter Barrier Wall Design Support – Drilling and Testing Summary Report, Georgia Power Company Plant McDonough-Atkinson, Ash Pond 1, WSP USA Inc., December 15, 2023.



## Tables



TABLE GW-1  
SUMMARY OF GROUNDWATER ELEVATIONS  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well ID	Top of Casing Elevation (feet NAVD 88) <sup>1</sup>	Groundwater Elevation (feet NAVD)																				
		8/29/2016	12/5/2016	3/27/2017	7/10/2017	10/23/2017	2/26/2018	7/9/2018	11/5/2018	3/11/2019	8/26/2019	10/14/2019	1/14/2020	8/10/2020	9/21/2020	11/3/2020	2/25/2021	10/27/2021	1/18/2022	9/6/2022	1/31/2023	9/5/2023
ASH POND 1 (AP-1) DETECTION MONITORING WELL NETWORK																						
DGWA-53	844.26	--	840.16	841.21	844.59	840.73	842.64	842.00	828.02	831.04	834.88	835.51	830.74	829.41	830.68	830.87	830.64	829.75	833.41	830.21	833.17	831.05
DGWA-70A	808.52	--	--	--	767.37	766.93	767.76	768.62	767.73	771.92	768.16	765.92	767.41	768.95	762.11	768.37	769.85	766.90	767.00	765.56	766.50	767.17
DGWA-71	863.84	--	--	834.8	835.84	835.32	835.56	835.70	834.78	837.74	835.40	834.53	835.49	835.74	835.26	835.91	836.52	835.19	835.49	834.48	834.26	832.52
DGWC-37	766.21	753.01	753.21	752.87	753.27	753.43	753.26	752.83	752.66	753.60	752.34	752.20	753.51	752.13	752.92	752.91	752.94	752.28	752.81	752.23	753.16	752.22
DGWC-38	757.43	751.24	751.24	750.99	751.00	751.60	751.09	750.74	750.60	753.11	750.73	750.53	751.57	750.97	751.54	751.70	751.50	751.08	751.38	750.93	751.50	750.85
DGWC-39	759.89	751.82	752.52	752.67	752.78	752.33	752.78	752.55	752.06	754.92	750.54	749.90	753.24	751.21	752.88	753.63	753.22	752.00	753.11	752.24	753.48	752.34
DGWC-40	779.06	760.98	760.74	761.80	762.95	760.69	762.45	762.90	761.06	764.26	759.01	757.60	761.44	760.12	761.56	762.55	762.56	760.54	761.83	760.17	762.10	761.21
DGWC-67	766.70	--	--	758.36	758.37	758.09	757.93	757.56	757.30	757.86	756.64	756.54	757.78	756.40	757.31	757.35	757.18	756.39	757.03	756.15	757.23	756.28
DGWC-68A	765.33	--	--	--	756.30	756.46	755.73	755.81	755.69	756.02	755.35	755.32	756.82	755.00	755.53	755.42	755.45	754.97	755.45	754.83	756.14	754.88
DGWC-69	763.75	--	--	758.22	758.15	758.48	758.50	758.03	757.99	758.57	757.77	757.63	758.88	757.37	758.01	758.10	758.26	757.55	758.17	757.45	758.53	757.68
DGWC-121	764.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	754.49	755.88	754.93
ASH POND 1 (AP-1) ASSESSMENT MONITORING WELL NETWORK																						
B-62	760.08	--	745.89	745.33	745.89	751.03	749.15	748.04	745.82	754.34	746.21	745.32	747.91	742.48	743.11	749.24	745.66	744.95	745.58	743.73	745.57	744.20
B-100	777.95	--	--	--	--	--	--	--	--	--	--	--	--	742.31	742.78	749.14	744.87	744.70	744.44	743.66	745.05	743.98
B-105D	779.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	762.82	760.75	762.19	760.68	762.42	761.57
B-112D	765.58	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	757.86	758.48	757.70	758.89	758.02





TABLE GW-1  
SUMMARY OF GROUNDWATER ELEVATIONS  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well ID	Top of Casing Elevation (feet NAVD 88) <sup>1</sup>	Groundwater Elevation (feet NAVD)																				
		8/29/2016	12/5/2016	3/27/2017	7/10/2017	10/23/2017	2/26/2018	7/9/2018	11/5/2018	3/11/2019	8/26/2019	10/14/2019	1/14/2020	8/10/2020	9/21/2020	11/3/2020	2/25/2021	10/27/2021	1/18/2022	9/6/2022	1/31/2023	9/5/2023
ASH POND 2 and ASH PONDS 3/4 (AP-2, 3/4) DETECTION MONITORING WELL NETWORK																						
DGWA-53	844.26	--	840.16	841.21	844.59	840.73	842.64	842.00	828.02	831.04	834.88	835.51	830.74	829.41	830.68	830.87	830.64	829.75	833.41	830.21	833.17	831.05
DGWA-70A	808.52	--	--	--	767.37	766.93	767.76	768.62	767.73	771.92	768.16	765.92	767.41	768.95	762.11	768.37	769.85	766.90	767.00	765.56	766.50	767.17
DGWA-71	863.84	--	--	834.80	835.84	835.32	835.56	835.70	834.78	837.74	835.40	834.53	835.49	835.74	835.26	835.91	836.52	835.19	835.49	834.48	834.26	832.52
DGWC-2	850.88	822.66	821.27	820.00	822.53	821.22	820.39	820.73	819.05	822.11	820.06	819.89	819.84	820.86	820.53	820.83	820.80	820.66	821.71	820.72	821.79	821.65
DGWC-4	814.85	797.89	797.37	798.47	798.95	796.24	795.91	794.37	793.07	794.83	791.98	791.36	792.98	791.48	791.43	792.04	791.90	790.13	790.75	789.10	790.66	789.40
DGWC-5	791.75	785.98	786.33	785.90	786.18	785.74	785.48	784.54	784.02	784.89	782.57	782.13	783.95	782.15	782.85	782.85	779.74	781.04	782.25	780.26	782.20	777.38
DGWC-8	826.38	812.00	808.38	807.69	811.43	805.36	799.81	797.87	795.21	798.35	794.48	793.75	794.72	793.33	793.57	793.85	792.07	787.64	786.94	786.86	788.20	790.92
DGWC-9	824.35	810.40	808.16	807.19	812.39	805.03	802.88	801.13	799.61	802.55	799.25	797.57	802.32	799.07	800.14	801.59	795.21	798.22	BTOP	795.82	798.86	791.35
DGWC-10	823.55	802.79	802.30	800.80	806.57	800.33	797.50	796.22	794.05	796.58	792.55	793.59	800.22	791.09	793.53	795.37	796.18	794.64	796.63	791.80	796.78	793.86
DGWC-11	800.57	791.49	792.56	791.44	795.26	791.15	790.61	789.86	787.57	789.89	786.81	787.22	792.92	783.81	786.33	788.68	789.25	785.55	790.14	784.41	791.01	787.69
DGWC-12	773.86	765.72	766.17	766.27	767.20	765.64	767.13	765.54	765.14	766.40	764.43	764.79	767.05	763.51	765.13	765.11	765.16	762.68	766.10	763.28	766.45	764.24
DGWC-13	794.10	760.19	760.30	760.39	761.49	--	768.46	760.44	759.55	760.10	760.69	759.94	761.06	760.55	761.87	760.77	759.96	760.25	759.56	760.03	759.88	760.08
DGWC-14	792.40	770.41	769.77	770.44	771.56	771.69	771.31	771.67	771.46	773.96	771.29	770.91	772.15	771.30	771.31	772.97	772.54	771.99	771.32	770.85	772.78	772.43
DGWC-15	824.50	786.06	785.21	785.13	786.08	786.06	785.28	785.79	785.38	786.89	784.94	784.52	784.74	785.05	784.94	785.33	785.02	784.44	783.82	783.46	783.36	784.64
DGWC-17	837.05	809.35	808.83	809.08	810.77	809.75	809.19	808.34	807.56	809.02	806.61	806.17	806.40	804.92	804.51	804.59	804.28	802.35	802.91	800.32	800.02	799.09
DGWC-19	825.46	804.25	803.58	803.81	806.11	804.73	805.36	804.70	804.16	805.05	803.21	802.51	802.61	801.16	801.20	801.51	801.18	800.23	800.23	799.23	798.83	798.81
DGWC-20	822.14	802.21	801.24	801.05	802.43	801.30	801.72	800.68	800.20	801.71	798.98	798.56	799.95	798.00	799.24	800.39	800.57	799.51	799.35	797.91	798.78	797.55
DGWC-21	816.28	802.74	801.41	800.77	800.50	799.79	799.85	799.03	798.47	799.09	798.22	796.96	797.51	796.96	798.78	800.10	800.73	799.93	799.38	797.85	797.98	797.24
DGWC-22	816.59	805.02	803.20	802.84	801.71	799.88	800.84	799.69	798.25	800.74	797.05	796.36	798.09	796.03	796.29	797.34	797.81	795.57	795.80	794.02	795.31	794.04
DGWC-23	818.37	804.61	804.84	804.88	803.89	802.66	804.02	801.83	800.61	803.75	798.64	797.77	802.29	797.89	798.92	799.67	800.82	795.74	799.31	795.43	800.18	796.20
DGWC-42	804.68	778.08	775.93	775.01	775.21	774.13	774.24	773.80	773.28	774.84	772.36	771.96	773.58	772.46	769.51	774.54	775.11	775.13	774.95	774.48	774.88	774.32
DGWC-47	797.45	776.88	776.70	778.54	780.25	778.16	779.78	780.70	779.15	782.01	774.51	773.79	780.84	777.61	780.49	781.06	781.11	777.86	780.54	780.54	781.70	780.90
DGWC-48	788.33	771.45	770.67	771.66	773.33	771.63	772.84	772.88	771.60	774.90	769.69	768.34	774.12	771.83	772.89	774.29	774.58	773.68	774.25	773.65	774.25	773.28





TABLE GW-1  
SUMMARY OF GROUNDWATER ELEVATIONS  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well ID	Top of Casing Elevation (feet NAVD 88) <sup>1</sup>	Groundwater Elevation (feet NAVD)																				
		8/29/2016	12/5/2016	3/27/2017	7/10/2017	10/23/2017	2/26/2018	7/9/2018	11/5/2018	3/11/2019	8/26/2019	10/14/2019	1/14/2020	8/10/2020	9/21/2020	11/3/2020	2/25/2021	10/27/2021	1/18/2022	9/6/2022	1/31/2023	9/5/2023
ASH POND 2 and ASH PONDS 3/4 (AP-2, 3/4) ASSESSMENT MONITORING WELL NETWORK																						
B-56	823.59	--	805.57	804.87	810.59	802.42	799.29	797.00	795.42	798.40	794.91	794.27	797.93	794.43	795.39	796.80	796.43	795.43	795.91	793.37	796.24	793.23
B-62	760.08	--	745.89	745.33	745.89	751.03	749.15	748.04	745.82	754.34	746.21	745.32	747.91	742.48	743.11	749.24	745.66	744.95	745.58	743.73	745.57	744.20
B-63	777.10	--	745.02	745.46	746.75	746.75	746.95	747.38	746.55	753.35	746.85	746.64	748.55	747.56	749.12	751.65	749.80	748.75	748.95	746.63	748.67	747.47
B-66	815.90	--	801.50	799.86	804.66	799.91	798.36	797.80	796.43	798.14	794.79	796.11	801.39	793.69	796.72	797.58	798.33	796.40	799.00	794.45	799.50	796.75
B-77	776.86	--	--	--	--	--	--	--	--	--	--	745.23	748.36	746.42	748.68	750.96	748.96	747.48	748.13	745.99	748.44	747.11
B-82	810.07	--	--	--	--	--	--	--	--	--	--	797.42	801.17	790.70	794.12	796.22	796.22	793.97	798.12	792.13	799.75	795.53
B-83	776.98	--	--	--	--	--	--	--	--	--	--	744.01	748.23	744.88	745.99	747.35	747.35	746.58	746.75	745.44	747.04	746.03
B-88	820.07	--	--	--	--	--	--	--	--	--	--	--	788.60	787.50	786.77	782.04	782.04	783.58	783.78	782.33	782.56	781.31
B-92	785.08	--	--	--	--	--	--	--	--	--	--	--	781.20	779.78	780.32	780.40	777.95	779.36	780.13	779.00	780.11	777.13
B-93	789.07	--	--	--	--	--	--	--	--	--	--	--	784.21	781.35	782.55	782.67	779.89	780.57	782.04	779.87	782.19	778.86
B-97	786.29	--	--	--	--	--	--	--	--	--	--	--	--	780.26	781.29	780.99	781.03	779.84	781.36	779.27	781.48	780.88
B-98	789.67	--	--	--	--	--	--	--	--	--	--	--	--	780.52	782.01	782.15	782.39	780.15	782.45	779.46	783.16	777.85
B-100	777.95	--	--	--	--	--	--	--	--	--	--	--	--	742.31	742.78	749.14	744.87	744.70	744.44	743.66	745.05	743.98
B-101D	824.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	793.26	793.84	793.97	792.29	794.78	786.09
B-102D	823.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	792.80	791.56	792.20	789.27	791.92	789.32
B-104D	787.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	781.64	780.44	780.77	780.82	781.88	781.03
B-106D	826.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	790.54	787.01	786.33	785.96	786.82	787.25
B-107D	823.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	801.98	800.95	800.67	799.55	799.95	798.90
B-108D	821.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	801.03	800.27	799.68	798.40	798.70	797.68
B-111D	791.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	781.12	780.07	781.56	779.43	781.72	779.50
B-120D	836.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	801.72	801.34	801.03	801.14	801.27
B-122D	777.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	746.21	747.93	746.75
B-125D	821.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	798.30
PIEZOMETERS																						
B-3	837.78	811.85	810.09	811.86	811.36	808.91	807.28	806.10	804.82	805.58	803.77	803.22	803.49	803.08	802.55	802.66	802.64	801.63	801.27	800.94	801.05	801.19
B-6	789.47	787.40	786.35	786.98	787.04	786.72	786.18	785.43	785.19	785.89	784.15	783.89	784.87	783.87	784.14	784.17	780.84	783.05	783.74	782.06	783.45	777.14
B-7	809.16	799.54	797.50	796.76	797.04	795.51	792.92	791.26	791.04	792.20	788.36	787.60	788.31	787.35	786.75	786.46	24.66	784.50	784.72	782.92	783.38	781.29
B-16	826.47	802.60	802.25	802.61	804.41	800.02	800.71	799.59	798.25	800.45	796.05	795.20	797.07	795.42	795.25	795.82	795.53	792.85	791.85	790.16	789.93	789.49
B-18	826.56	809.19	808.33	808.53	811.84	810.19	810.71	809.21	808.21	810.41	807.50	806.93	807.45	804.91	804.71	805.23	805.28	803.08	803.71	802.04	803.29	801.57
B-24	822.11	806.65	804.87	807.18	808.10	804.72	806.23	805.47	803.00	809.86	803.09	801.61	804.56	803.11	802.87	803.49	805.30	804.48	803.92	799.68	802.02	800.08
B-25	836.54	821.63	822.51	823.42	823.85	822.68	824.06	822.50	821.06	824.12	819.20	817.71	824.24	818.43	821.53	822.84	823.32	818.52	822.26	816.07	823.35	820.42
B-26	853.60	829.13	827.14	829.97	831.02	827.90	829.45	828.59	826.26	833.30	826.25	824.82	827.27	826.64	825.55	827.05	829.40	825.71	826.72	824.89	826.78	831.44
B-28	816.08	793.30	792.40	792.42	792.12	789.56	791.14	790.07	787.90	791.89	786.52	785.52	788.99	786.05	786.95	787.92	788.96	785.73	786.64	784.54	786.24	785.49
B-29	816.43	790.87	790.42	792.15	792.30	789.57	791.80	790.69	788.83	793.96	787.99	786.97	790.46	788.57	788.90	790.08	791.34	787.34	788.92	786.02	789.01	787.04
B-31	797.47	764.17	764.31	764.68	766.38	763.81	765.11	765.23	763.62	766.88	763.61	763.07	764.73	763.94	764.01	764.21	764.60	763.41	763.85	763.12	764.06	763.45
B-41	795.20	774.74	773.24	772.28	772.46	770.97	771.32	771.01	770.28	771.76	768.70	767.98	770.50	768.70	769.91	770.89	770.92	770.17	770.93	769.93	770.80	770.09
B-50	809.67	783.18	781.78	781.93	782.49	781.16	782.32	782.04	781.00	783.83	780.34	780.17	782.75	781.58	784.77	786.78	788.27	787.79	787.64	786.10	787.20	786.55
B-51	765.92	753.69	753.90	753.57	753.89	754.08	753.86	753.44	753.26	754.15	753.00	752.80	754.07	752.66	753.37	753.42	753.46	752.76	753.29	752.64	753.60	752.70
B-52	822.89	--	796.52	799.44	800.17	797.09	798.56	798.66	795.73	803.49	796.58	794.51	795.78	796.63	795.34	795.87	797.86	797.81	797.23	793.02	793.47	792.80
B-54	785.46	--	781.24	780.81	780.91	781.23	780.67	780.09	780.28	780.44	779.46	779.47	780.33	779.52	779.86	779.96	777.08	779.36	779.74	779.07	779.77	776.53
B-55	825.12	--	812.13	810.46	815.77	807.47	805.77	804.55	803.08	805.21	802.68	803.89	806.37	802.40	804.99	805.72	802.49	798.84	799.41	797.89	801.63	798.00





TABLE GW-1  
SUMMARY OF GROUNDWATER ELEVATIONS  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well ID	Top of Casing Elevation (feet NAVD 88) <sup>1</sup>	Groundwater Elevation (feet NAVD)																				
		8/29/2016	12/5/2016	3/27/2017	7/10/2017	10/23/2017	2/26/2018	7/9/2018	11/5/2018	3/11/2019	8/26/2019	10/14/2019	1/14/2020	8/10/2020	9/21/2020	11/3/2020	2/25/2021	10/27/2021	1/18/2022	9/6/2022	1/31/2023	9/5/2023
PIEZOMETERS																						
B-57	789.04	--	766.42	767.55	769.46	768.51	768.52	770.71	768.67	773.56	767.91	766.19	768.14	769.93	770.02	771.62	771.66	770.89	770.19	769.63	770.22	770.46
B-58	788.17	--	764.20	765.36	767.61	766.40	766.63	768.59	766.37	771.75	765.57	763.75	766.02	767.77	767.76	769.52	769.72	769.31	768.75	768.27	768.81	768.88
B-59	788.00	--	782.84	782.46	782.58	782.62	782.22	781.46	781.51	781.83	780.40	780.31	781.42	780.39	780.72	780.85	775.67	779.88	780.60	779.44	780.51	775.08
B-60	782.13	--	748.58	748.44	749.87	749.49	749.48	751.13	749.78	755.46	749.91	748.89	750.33	750.42	751.22	753.80	752.32	751.61	751.29	750.08	751.28	750.98
B-61	782.09	--	758.46	759.12	761.86	760.30	760.82	762.98	760.50	766.59	759.78	758.06	760.58	761.75	762.24	764.58	764.34	763.66	763.24	762.50	765.41	763.33
B-64	785.83	--	781.29	781.40	781.50	781.67	781.20	780.54	780.67	781.01	779.69	779.66	780.89	779.70	780.14	780.27	776.49	779.28	780.03	779.03	779.97	776.01
B-65	821.95	--	811.62	811.38	814.82	811.24	806.45	805.56	803.98	807.77	803.79	803.22	804.63	803.50	803.40	804.50	821.95	801.83	801.53	804.03	809.90	807.43
B-68	758.68	--	--	755.45	--	--	--	--	--	--	754.84	754.81	756.20	754.72	755.19	755.09	755.14	754.70	755.12	754.58	755.68	754.61
B-72	758.46	--	--	--	--	--	--	--	--	--	--	--	--	755.04	754.83	755.35	755.35	754.96	755.33	754.86	755.63	754.86
B-73	759.21	--	--	--	--	--	--	--	--	--	--	--	--	754.72	755.26	755.12	755.21	754.71	755.29	754.48	756.06	754.58
B-74	759.06	--	--	--	--	--	--	--	--	--	--	--	--	754.90	754.68	754.59	755.39	754.90	755.31	754.61	755.71	754.82
B-76	760.53	--	--	--	--	--	--	--	--	--	--	743.20	746.62	745.42	745.11	750.04	746.06	745.71	746.10	744.63	746.19	745.16
B-78	790.75	--	--	--	--	--	--	--	--	--	--	779.94	781.70	780.25	780.84	780.90	778.67	779.65	780.47	779.19	780.56	777.51
B-79	788.66	--	--	--	--	--	--	--	--	--	--	781.71	782.74	781.84	782.14	782.21	780.49	781.58	781.97	781.01	781.92	778.65
B-80	804.47	--	--	--	--	--	--	--	--	--	--	786.97	787.99	787.10	786.62	786.37	786.13	784.84	785.16	783.21	784.07	781.09
B-81	820.56	--	--	--	--	--	--	--	--	--	--	788.80	789.17	788.63	787.86	782.41	782.41	784.31	784.29	782.91	783.05	782.57
B-85	782.54	--	--	--	--	--	--	--	--	--	--	--	780.27	779.54	775.63	777.76	777.76	779.14	779.69	779.10	779.78	777.16
B-86	784.29	--	--	--	--	--	--	--	--	--	--	--	783.38	782.34	777.24	781.22	781.22	782.10	782.65	781.56	782.57	779.45
B-87	803.37	--	--	--	--	--	--	--	--	--	--	--	787.81	786.87	786.57	785.95	785.95	784.94	785.35	783.35	784.43	781.12
B-89	822.36	--	--	--	--	--	--	--	--	--	--	--	800.58	799.35	799.26	800.36	822.36	796.56	795.86	797.69	801.06	798.44
B-90	784.00	--	--	--	--	--	--	--	--	--	--	--	783.12	781.14	782.44	782.50	781.36	781.97	782.48	781.48	782.30	779.83
B-91	782.98	--	--	--	--	--	--	--	--	--	--	--	780.08	779.29	779.60	779.67	778.00	779.18	779.58	778.93	779.40	777.87
B-94	801.74	--	--	--	--	--	--	--	--	--	--	--	--	786.71	786.49	786.26	785.79	784.86	785.30	783.27	784.40	780.81
B-95	784.00	--	--	--	--	--	--	--	--	--	--	--	--	781.58	781.89	781.92	781.45	781.90	782.15	781.30	782.15	780.25
B-96	784.92	--	--	--	--	--	--	--	--	--	--	--	--	779.37	779.82	779.85	778.30	778.88	779.66	778.77	779.61	777.67
B-99	782.39	--	--	--	--	--	--	--	--	--	--	--	--	778.57	778.97	778.99	779.06	778.63	779.44	778.27	779.37	777.86
B-103D	795.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	783.50	782.28	783.34	782.74	783.57	782.46
B-109D	850.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	812.13	811.87	811.95	811.56	811.83	811.84
B-110D	764.61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	756.55	755.69	756.09	755.43	756.49	755.40
B-113D	758.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	756.21	756.79	756.18	757.2	756.25
B-115D	789.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	768.96	768.28	767.79	768.34	768.58
B-116D	807.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	764.80	765.35	763.52	765.43	764.50
B-117D	863.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	834.63	834.67	833.87	834.35	831.99
B-118	807.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	756.15	756.6	755.79	756.73	755.74
B-119D	807.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	759.14	759.76	759.05	760.26	759.24
B-123D	781.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	769.00	768.02	769.56

- Notes:
1. Elevation data recorded in feet referenced to the North American Vertical Datum 1988 (NAVD 88)
  2. Survey data for monitoring wells and piezometers provided by Metro Engineering.
  3. "--" Data were not recorded or well was not in place at the time of measurement.
  4. Data presented for AP-1 are included for reference only as data are used to support the conceptual site model. These data should not be considered for permitting of AP-2 and 3/4.





**TABLE GW-2**  
**GROUNDWATER VELOCITY CALCULATIONS - JANUARY 2023**

Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Flow Paths	Groundwater Elevation (feet)	$\Delta h$ (feet) <sup>1</sup>	$\Delta l$ (feet) <sup>2</sup>	Hydraulic Gradient ( $\Delta h/\Delta l$ ) <sup>3</sup>	Average Hydraulic Conductivity, K (centimeter per second) <sup>5</sup>	Assumed Effective Porosity ( $n_e$ ) <sup>6</sup>	Average Linear Groundwater Velocity	
							(feet per day) <sup>4</sup>	(feet per year) <sup>4</sup>
ASH POND 1 (AP-1)								
B-29/DGWC-68A	789.01	32.87	900	0.037	0.00077	0.2	0.40	145
	756.14							
B-28/DGWC-37	786.24	33.08	1700	0.019	0.00077	0.2	0.21	77
	753.16							
B-50/DGWC-39	787.20	33.72	1400	0.024	0.00077	0.2	0.26	96
	753.48							
ASH POND 2 AND ASH PONDS 3/4 (AP-2, 3/4)								
DGWA-53/DGWC-13	833.17	73.29	2550	0.029	0.00077	0.2	0.31	114
	759.88							
B-26/DGWC-48	826.78	52.53	2000	0.026	0.00077	0.2	0.29	105
	774.25							

**Notes:**

1.  $\Delta h$  = Change in groundwater elevation
2.  $\Delta l$  = Distance along flow path
3.  $I = \Delta h / \Delta l$
4. Velocity =  $(I * K)/n_e$
5. Hydraulic conductivity based on historic aquifer performance tests
6. Assumed effective porosities for overburden was based on the default values recommended by USEPA for a silty sand-type soil (1996). Assumed effective porosity for bedrock was derived from Daniel and Dahlen (2002) and Dowd and Marshall (1995).



TABLE GW-3  
SUMMARY OF AQUIFER TEST DATA  
Georgia Power Company - Plant McDonough  
Atlanta, GA

SCREENED LITHOLOGY	PIEZOMETER IDENTIFICATION	SATURATED AQUIFER THICKNESS VALUE (feet)	SCREEN LENGTH (feet)	PIEZOMETER DIAMETER (inches)	AQUIFER ANALYSIS METHOD	AQUIFER TEST TYPE	HYDRAULIC CONDUCTIVITY (cm/sec)
OVERBURDEN	DGWC-9	63	10	2	Bouwer-Rice	Falling	5.0E-04
	DGWC-13	15	10	2	Bouwer-Rice	Falling	5.8E-04
						Rising	9.1E-04
	DGWC-19	25	10	2	Bouwer-Rice	Falling	7.2E-04
						Rising	8.6E-04
	DGWA-70A	20	10	2	Bouwer-Rice	Falling	2.50E-04
						Rising	1.54E-04
	DGWA-71	19	10	2	Bouwer-Rice	Falling	4.26E-04
						Rising	3.50E-04
	DGWC-67	47	10	2	Bouwer-Rice	Falling	2.13E-04
						Rising	3.02E-04
	DGWC-68A	20	10	2	Bouwer-Rice	Falling	4.48E-04
						Rising	4.09E-04
	DGWC-69	18	10	2	Bouwer-Rice	Falling	9.84E-05
						Rising	1.93E-04
	B-40	23	10	2	Bouwer-Rice	Falling	3.4E-03
						Rising	2.8E-03
	B-41	45	10	2	Bouwer-Rice	Falling	6.2E-04
	B-50	20	10	2	Bouwer-Rice	Falling	7.2E-04
						Rising	6.4E-04
	B-51	60	10	2	Bouwer-Rice	Falling	5.7E-04
						Rising	5.1E-04





TABLE GW-3  
SUMMARY OF AQUIFER TEST DATA  
Georgia Power Company - Plant McDonough  
Atlanta, GA

SCREENED LITHOLOGY	PIEZOMETER IDENTIFICATION	SATURATED AQUIFER THICKNESS VALUE (feet)	SCREEN LENGTH (feet)	PIEZOMETER DIAMETER (inches)	AQUIFER ANALYSIS METHOD	AQUIFER TEST TYPE	HYDRAULIC CONDUCTIVITY (cm/sec)
UPPER BEDROCK	DGWC-14	18	10	2	Bouwer-Rice	Falling	1.4E-03
						Rising	1.3E-03
	B-24	75	10	2	Bouwer-Rice	Falling	4.8E-05
	B-26	35	10	2	Bouwer-Rice	Falling	7.1E-06
	B-27	25	10	2	Bouwer-Rice	Falling	1.8E-03
						Rising	1.3E-03
	DGWC-47	100	10	2	Bouwer-Rice	Falling	3.5E-05
						Rising	2.7E-05
	DGWC-48	20	10	2	Bouwer-Rice	Falling	8.1E-05
						Rising	9.0E-05
	B-101D	100	10	2	Bouwer-Rice	Falling	4.30E-05
						Rising	1.16E-05
	B-102D	100	10	2	Bouwer-Rice	Falling	7.21E-05
						Rising	8.75E-05
	B-104D	100	10	2	Bouwer-Rice	Falling	2.09E-05
						Rising	3.80E-05
	B-105D	100	10	2	Bouwer-Rice	Falling	1.26E-04
						Rising	1.47E-04
	B-106D	100	10	2	Bouwer-Rice	Falling	9.17E-05
						Rising	3.53E-04
	B-107D	100	10	2	Bouwer-Rice	Falling	2.44E-05
						Rising	4.08E-03
	B-108D	100	10	2	Bouwer-Rice	Falling	2.83E-05
						Rising	1.92E-04
	B-109D	100	10	2	Bouwer-Rice	Falling	3.14E-05
						Rising	1.99E-05
	B-111D	100	10	2	Bouwer-Rice	Falling	2.2E-04
						Rising	2.1E-04





TABLE GW-3  
SUMMARY OF AQUIFER TEST DATA  
Georgia Power Company - Plant McDonough  
Atlanta, GA

SCREENED LITHOLOGY	PIEZOMETER IDENTIFICATION	SATURATED AQUIFER THICKNESS VALUE (feet)	SCREEN LENGTH (feet)	PIEZOMETER DIAMETER (inches)	AQUIFER ANALYSIS METHOD	AQUIFER TEST TYPE	HYDRAULIC CONDUCTIVITY (cm/sec)
BEDROCK	B-112D	100	10	2	Bouwer-Rice	Falling	6.7E-04
						Falling	9.6E-04
	B-113D	100	10	2	Bouwer-Rice	Falling	3.2E-04
						Rising	1.1E-04
						Falling	7.3E-04
						Rising	7.9E-04
	B-115D	100	10	2	Bouwer-Rice	Falling	6.8E-05
						Rising	4.8E-05
	B-116D	100	10	2	Bouwer-Rice	Falling	4.1E-04
						Rising	4.1E-04
	B-117D	100	10	2	Bouwer-Rice	Falling	2.5E-04
						Rising	6.4E-05
	B-118	100	10	2	Bouwer-Rice	Falling	4.2E-04
						Rising	8.0E-04
	B-119D	100	10	2	Bouwer-Rice	Falling	5.7E-05
						Rising	1.4E-05
	B-120D	100	10	2	Bouwer-Rice	Falling	1.5E-02
						Rising	1.5E-02
						Falling	9.6E-03
						Rising	1.8E-02

NOTES:

- 1. Overburden is the material overlying the upper bedrock, including residual soils, saprolite, transitionally weathered rock, and partially weathered rock.
- 2. Upper Bedrock is based on the depth at which rock quality data showed a significant thickness of fresh, relatively competent bedrock.
- 3. Geomean = geometric mean
- 4. cm/sec = centimeter per second
- 5. Data presented for CCR Unit AP-1 is included for reference only. This data should not be considered for permitting of CCR Units AP-2 and 3/4.





**TABLE GW-4**  
**SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA**  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
<b>ASH POND 1 (AP-1) DETECTION MONITORING WELL NETWORK</b>											
DGWA-53	Upgradient	Upper Bedrock	1393472.8	2201668.8	844.26	841.37	28.9	823.8	813.8	10	9/24/2016
DGWA-70A	Upgradient	Overburden	1390481.4	2200591.6	808.52	805.67	59.3	756.8	746.8	10	5/10/2017
DGWA-71	Upgradient	Overburden	1393963.3	2201714.8	863.84	861.22	43.8	827.8	817.8	10	2/28/2017
DGWC-37	Downgradient	Overburden	1390482.2	2200919.8	766.21	763.64	39.7	734.3	724.3	10	11/28/2012
DGWC-38	Downgradient	Overburden	1390362.7	2201148.6	757.43	754.67	25.0	740.0	730.0	10	11/29/2012
DGWC-39	Downgradient	Overburden	1390303.6	2201540.1	759.89	756.93	21.2	746.1	736.1	10	11/6/2012
DGWC-40	Downgradient	Overburden	1390625.7	2201825.9	779.06	776.12	34.9	751.6	741.6	10	11/5/2012
DGWC-67	Downgradient	Overburden	1390953.8	2200830.7	766.70	766.80	56.3	720.5	710.5	10	3/14/2017
DGWC-68A	Downgradient	Overburden	1391301.2	2200734.9	765.33	765.06	29.8	745.7	735.7	10	4/20/2017
DGWC-69	Downgradient	Overburden	1391585.0	2200657.1	763.75	763.99	24.3	749.7	739.7	10	3/16/2017
DGWC-121	Downgradient	Overburden	1390739.7	2200849.4	764.16	764.52	50.0	724.8	714.8	10	3/22/2022
<b>ASH POND 1 (AP-1) ASSESSMENT MONITORING WELL NETWORK</b>											
B-62	Downgradient	Upper Bedrock	1389828.1	2201811.2	760.08	760.40	39.9	730.7	720.7	10	10/4/2016
B-100	Downgradient	Overburden	1390254.8	2202242.1	777.95	775.32	44.8	740.5	730.5	10	7/8/2020
B-105D	Downgradient	Upper Bedrock	1390634.5	2201831.9	779.01	776.03	70.0	716.0	706.0	10	10/19/2020
B-112D	Downgradient	Upper Bedrock	1391564.2	2200664.1	765.58	765.98	55.0	721.3	711.3	10	3/22/2021



**TABLE GW-4**  
**SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA**  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
<b>ASH POND 2 and ASH PONDS 3/4 (AP-2, 3/4) DETECTION MONITORING WELL NETWORK</b>											
DGWA-53	Upgradient	Upper Bedrock	1393472.8	2201668.8	844.26	841.37	28.9	823.8	813.8	10	9/24/2016
DGWA-70A	Upgradient	Overburden	1390481.4	2200591.6	808.52	805.67	59.3	756.8	746.8	10	5/10/2017
DGWA-71	Upgradient	Overburden	1393963.3	2201714.8	863.84	861.22	43.8	827.8	817.8	10	2/28/2017
DGWC-2	Downgradient	Overburden/Upper Bedrock	1393958.0	2202119.5	850.88	848.17	49.0	809.5	799.5	10	10/2/2012
DGWC-4	Downgradient	Overburden	1394171.5	2202662.4	814.85	812.06	45.0	777.4	767.4	10	10/3/2012
DGWC-5	Downgradient	Overburden/Upper Bedrock	1394306.3	2202965.1	791.75	788.64	30.0	768.9	758.9	10	10/4/2012
DGWC-8	Downgradient	Overburden	1394322.2	2203882.1	826.38	824.02	49.1	785.3	775.3	10	10/10/2012
DGWC-9	Downgradient	Overburden	1394055.9	2204170.0	824.35	821.86	30.0	802.3	792.3	10	10/10/2012
DGWC-10	Downgradient	Overburden	1393818.3	2204201.1	823.55	820.82	45.4	785.8	775.8	10	10/11/2012
DGWC-11	Downgradient	Overburden	1393547.1	2204166.2	800.57	797.99	49.1	759.2	749.2	10	10/15/2012
DGWC-12	Downgradient	Overburden	1393149.4	2204128.3	773.86	771.10	25.1	756.4	746.4	10	10/15/2012
DGWC-13	Downgradient	Overburden	1392881.1	2204084.6	794.10	791.20	43.8	757.8	747.8	10	11/29/2012
DGWC-14	Downgradient	Overburden/Upper Bedrock	1392574.2	2204013.3	792.40	789.69	34.3	765.8	755.8	10	12/18/2012
DGWC-15	Downgradient	Overburden	1392544.1	2203679.0	824.50	821.43	67.1	764.7	754.7	10	11/29/2012
DGWC-17	Downgradient	Overburden	1392645.6	2203051.0	837.05	834.14	44.5	799.9	789.9	10	1/9/2013
DGWC-19	Downgradient	Overburden	1392342.6	2202601.0	825.46	822.87	39.8	793.5	783.5	10	3/12/2013
DGWC-20	Downgradient	Overburden	1392164.5	2202315.6	822.14	819.66	39.7	790.6	780.6	10	3/5/2013
DGWC-21	Downgradient	Overburden/Upper Bedrock	1392067.5	2202063.5	816.28	813.47	69.0	754.9	744.9	10	10/31/2012
DGWC-22	Downgradient	Upper Bedrock	1392126.3	2201791.9	816.59	813.69	60.0	764.0	754.0	10	10/25/2012
DGWC-23	Downgradient	Upper Bedrock	1392239.7	2201582.0	818.37	815.63	60.1	765.8	755.8	10	10/25/2012
DGWC-42	Downgradient	Overburden	1391327.8	2201870.2	804.68	801.98	50.4	762.1	752.1	10	11/12/2012
DGWC-47	Downgradient	Overburden/Upper Bedrock	1391553.8	2202610.5	797.45	794.35	28.8	776.0	766.0	10	6/23/2016
DGWC-48	Downgradient	Overburden/Upper Bedrock	1391314.6	2202290.2	788.33	785.21	30.0	765.6	755.6	10	6/22/2016



**TABLE GW-4**  
**SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA**  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
<b>ASH POND 2 and ASH PONDS 3/4 (AP-2, 3/4) ASSESSMENT MONITORING WELL NETWORK</b>											
B-56	Downgradient	Overburden	1393957.9	2204187.8	823.59	820.95	45.0	786.4	776.4	10	10/3/2016
B-62	Downgradient	Upper Bedrock	1389828.1	2201811.2	760.08	760.40	39.9	730.7	720.7	10	10/4/2016
B-63	Downgradient	Overburden	1390999.1	2202978.1	777.10	777.37	46.0	741.9	731.9	10	10/6/2016
B-66	Downgradient	Overburden	1393858.2	2204277.5	815.90	813.33	55.3	768.3	758.3	10	11/16/2016
B-77	Downgradient	Overburden	1390948.7	2202942.0	776.86	777.12	42.0	745.1	735.1	10	9/17/2019
B-82	Downgradient	Overburden	1393750.0	2204258.1	810.07	807.55	45.0	773.1	763.1	10	9/21/2019
B-83	Downgradient	Overburden	1390735.5	2202695.6	776.98	777.17	48.6	738.6	728.6	10	9/30/2019
B-88	Downgradient	Overburden	1394401.1	2203738.3	820.07	816.80	72.0	754.8	744.8	10	11/15/2019
B-92	Downgradient	Overburden	1394392.7	2203026.7	785.08	785.30	25.0	770.7	760.7	10	12/11/2019
B-93	Downgradient	Overburden	1394348.7	2202946.7	789.07	789.19	29.2	770.3	760.3	10	12/12/2019
B-97	Downgradient	Overburden/Upper Bedrock	1394430.0	2203008.3	786.29	786.50	31.7	765.2	755.2	10	2/11/2020
B-98	Downgradient	Overburden	1394392.5	2202934.0	789.67	789.81	19.4	780.8	770.8	10	2/10/2020
B-100	Downgradient	Overburden	1390254.8	2202242.1	777.95	775.32	44.8	740.5	730.5	10	7/8/2020
B-101D	Downgradient	Overburden/Upper Bedrock	1394063.6	2204168.2	824.29	821.24	75.0	756.3	746.3	10	11/12/2020
B-102D	Downgradient	Upper Bedrock	1393828.4	2204200.4	823.42	820.64	85.0	746.2	736.2	10	11/10/2020
B-104D	Downgradient	Upper Bedrock	1391318.3	2202298.5	787.90	785.31	60.0	735.3	725.3	10	10/20/2020
B-106D	Downgradient	Upper Bedrock	1394327.1	2203869.2	826.21	823.39	80.0	754.0	744.0	10	11/13/2020
B-107D	Downgradient	Upper Bedrock	1392334.5	2202596.4	823.38	820.44	85.8	745.3	735.3	10	10/28/2020
B-108D	Downgradient	Upper Bedrock	1392156.1	2202312.5	821.13	818.33	80.0	749.3	739.3	10	10/27/2020
B-111D	Downgradient	Upper Bedrock	1394303.6	2202956.4	791.84	788.99	85.0	714.8	704.8	10	11/3/2020
B-120D	Downgradient	Upper Bedrock	1394047.2	2202436.4	836.42	834.03	69.3	775.0	765.0	10	3/6/2021
B-122D	Downgradient	Bedrock	1390992.8	2202975.4	777.03	777.32	79.8	707.5	697.5	10	3/24/2022
B-125D	Downgradient	Bedrock	1394111.6	2202580.7	821.70	819.15	145.4	684.1	674.1	10	3/31/2023



**TABLE GW-4**  
**SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA**  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
<b>PIEZOMETERS</b>											
B-3	Downgradient	Overburden/Upper Bedrock	1394045.1	2202411.5	837.78	834.86	37.0	808.2	798.2	10	10/3/2012
B-6	Downgradient	Overburden	1394419.5	2203266.5	789.47	786.45	35.4	761.5	751.5	10	10/9/2012
B-7	Downgradient	Overburden	1394374.6	2203596.1	809.16	806.04	25.2	791.2	781.2	10	10/9/2012
B-16	Downgradient	Overburden	1392595.1	2203315.4	826.47	823.54	43.7	790.1	780.1	10	12/19/2012
B-18	Downgradient	Overburden	1392521.0	2202875.5	826.56	823.89	32.6	801.5	791.5	10	1/10/2013
B-24	Downgradient	Upper Bedrock	1392479.9	2201450.0	822.11	819.19	79.1	750.9	740.9	10	10/24/2012
B-25	Downgradient	Upper Bedrock	1392813.3	2201502.7	836.54	833.41	54.8	789.0	779.0	10	10/24/2012
B-26	Downgradient	Upper Bedrock	1393105.6	2201550.4	853.60	850.61	49.3	811.7	801.7	10	10/23/2012
B-28	Downgradient	Overburden/Upper Bedrock	1391967.4	2201679.2	816.08	813.28	69.4	754.3	744.3	10	10/31/2012
B-29	Downgradient	Overburden	1391890.0	2201422.0	816.43	813.47	54.4	769.4	759.4	10	1/11/2013
B-31	Downgradient	Upper Bedrock	1392034.3	2200928.5	797.47	794.84	45.1	760.1	750.1	10	1/22/2013
B-41	Downgradient	Overburden	1390920.8	2201751.9	795.20	792.40	60.0	743.0	733.0	10	11/14/2012
B-50	Downgradient	Overburden	1391657.1	2201841.0	809.67	809.20	35.2	784.4	774.4	10	6/24/2016
B-51	Downgradient	Overburden	1390501.2	2200906.5	765.92	763.29	65.0	708.3	698.3	10	6/27/2016
B-52	Downgradient	Overburden	1392308.3	2201314.8	822.89	820.18	50.0	781.3	771.3	10	9/28/2016
B-54	Downgradient	Overburden/Upper Bedrock	1394423.5	2203140.7	785.46	782.54	34.2	758.7	748.7	10	9/26/2016
B-55	Downgradient	Overburden	1394142.6	2204147.9	825.12	822.86	52.0	781.9	771.9	10	9/22/2016
B-57	Downgradient	Upper Bedrock	1391396.3	2202736.9	789.04	786.03	50.5	746.0	736.0	10	9/24/2016
B-58	Downgradient	Overburden	1391125.7	2202426.5	788.17	785.20	45.0	750.7	740.7	10	9/23/2016
B-59	Downgradient	Overburden/Upper Bedrock	1394349.1	2203001.1	788.00	785.41	30.3	765.2	755.2	10	9/23/2016
B-60	Downgradient	Overburden	1391100.7	2202881.6	782.13	779.25	49.8	740.0	730.0	10	9/29/2016
B-61	Downgradient	Overburden	1390957.8	2202505.8	782.09	778.95	51.9	737.5	727.5	10	9/29/2016
B-64	Downgradient	Overburden	1394381.9	2203031.3	785.83	785.98	30.4	766.0	756.0	10	11/2/2016
B-65	Downgradient	Overburden/Upper Bedrock	1394381.2	2204050.8	821.95	822.30	45.4	787.9	777.9	10	11/15/2016



**TABLE GW-4**  
**SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA**  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
<b>PIEZOMETERS</b>											
B-68	Downgradient	Overburden	1391298.2	2200714.2	758.68	759.05	18.0	751.1	741.1	10	3/16/2017
B-72	Downgradient	Overburden	1391241.4	2200725.9	758.46	758.45	21.9	747.0	737.0	10	4/19/2017
B-73	Downgradient	Overburden	1391351.8	2200699.4	759.21	759.16	15.8	753.8	743.8	10	4/19/2017
B-74	Downgradient	Overburden	1391279.9	2200666.1	759.06	759.18	16.2	748.4	743.4	5	4/25/2017
B-76	Downgradient	Overburden	1390717.4	2202756.9	760.53	760.87	38.5	732.4	722.4	10	9/18/2019
B-78	Downgradient	Overburden/Upper Bedrock	1394328.2	2202958.2	790.75	787.79	30.0	767.8	758.3	10	9/22/2019
B-79	Downgradient	Overburden	1394458.6	2203223.0	788.66	785.84	34.9	760.9	751.4	10	9/21/2019
B-80	Downgradient	Overburden	1394372.6	2203533.9	804.47	801.73	30.0	781.9	772.4	10	9/20/2019
B-81	Downgradient	Overburden	1394364.9	2203741.1	820.56	817.64	50.0	778.5	768.5	10	9/22/2019
B-84	Downgradient	Overburden	1390411.9	2202241.9	776.34	776.52	49.1	737.4	727.4	10	10/1/2019
B-85	Downgradient	Overburden/Upper Bedrock	1394433.4	2203134.5	782.54	782.71	34.5	758.5	748.5	10	11/18/2019
B-86	Downgradient	Overburden/Upper Bedrock	1394480.0	2203206.6	784.29	784.52	34.1	760.4	750.4	10	11/18/2019
B-87	Downgradient	Overburden	1394401.9	2203531.3	803.37	800.32	42.0	768.6	758.6	10	11/17/2019
B-89	Downgradient	Upper Bedrock	1394398.4	2204049.4	822.36	822.53	49.5	783.0	773.0	10	11/19/2019
B-90	Downgradient	Overburden	1394501.0	2203212.6	784.00	784.16	33.4	760.8	750.8	10	12/10/2019
B-91	Downgradient	Overburden	1394447.1	2203123.9	782.98	783.10	35.0	758.5	748.5	10	12/11/2019
B-94	Downgradient	Overburden	1394402.0	2203513.7	801.74	799.12	45.2	764.5	754.5	10	1/23/2020
B-95	Downgradient	Overburden	1394518.6	2203167.7	784.00	784.18	33.3	761.2	751.2	10	2/11/2020
B-96	Downgradient	Overburden	1394478.7	2203099.3	784.92	785.19	33.1	762.1	752.1	10	2/10/2020
B-99	Downgradient	Overburden	1394524.2	2203084.5	782.39	782.57	12.3	775.3	770.3	5	7/7/2020



TABLE GW-4  
SUMMARY OF MONITORING WELL, ASSESSMENT WELL AND PIEZOMETER CONSTRUCTION DATA  
Georgia Power Company - Plant McDonough  
Atlanta, Georgia

Well-ID	Hydraulic Location	Screened Media	NAD 83 Northing	NAD 83 Easting	Top of Casing Elevation (feet NAVD 88)	Ground Surface Elevation (feet NAVD 88)	Total Well Depth (feet bgs)	Top of Screen Elevation (feet NAVD 88)	Bottom of Screen Elevation (feet NAVD 88)	Screen Length (feet)	Date of Installation
PIEZOMETERS											
B-103D	Downgradient	Upper Bedrock	1391543.5	2202614.4	795.96	793.77	70.0	733.8	723.8	10	10/15/2020
B-109D	Downgradient	Upper Bedrock	1393957.5	2202127.0	850.73	847.78	100.0	758.4	748.4	10	10/31/2020
B-110D	Downgradient	Upper Bedrock	1391294.4	2200736.0	764.61	764.55	65.0	711.6	701.6	10	11/17/2020
B-113D	Downgradient	Upper Bedrock	1391264.6	2200719.2	758.22	758.87	84.7	684.5	674.5	10	3/30/2021
B-115D	Downgradient	Upper Bedrock	1391265.3	2202580.7	789.17	786.43	79.5	717.2	707.2	10	3/20/2021
B-116D	Upgradient	Upper Bedrock	1390483.7	2200611.0	807.82	805.31	89.5	726.1	716.1	10	3/8/2021
B-117D	Upgradient	Upper Bedrock	1393963.8	2201727.3	863.82	861.23	75.0	796.5	786.5	10	3/17/2021
B-118	Upgradient	Upper Bedrock	1391219.3	2200449.7	807.70	804.99	75.2	740.1	730.1	10	3/9/2021
B-119D	Upgradient	Upper Bedrock	1391236.4	2200446.6	807.15	804.53	105.0	709.8	699.8	10	3/16/2021
B-123D	Downgradient	Bedrock	1391234.4	2202608.4	781.80	778.85	160.0	668.9	618.9	50	4/4/2022

Notes:

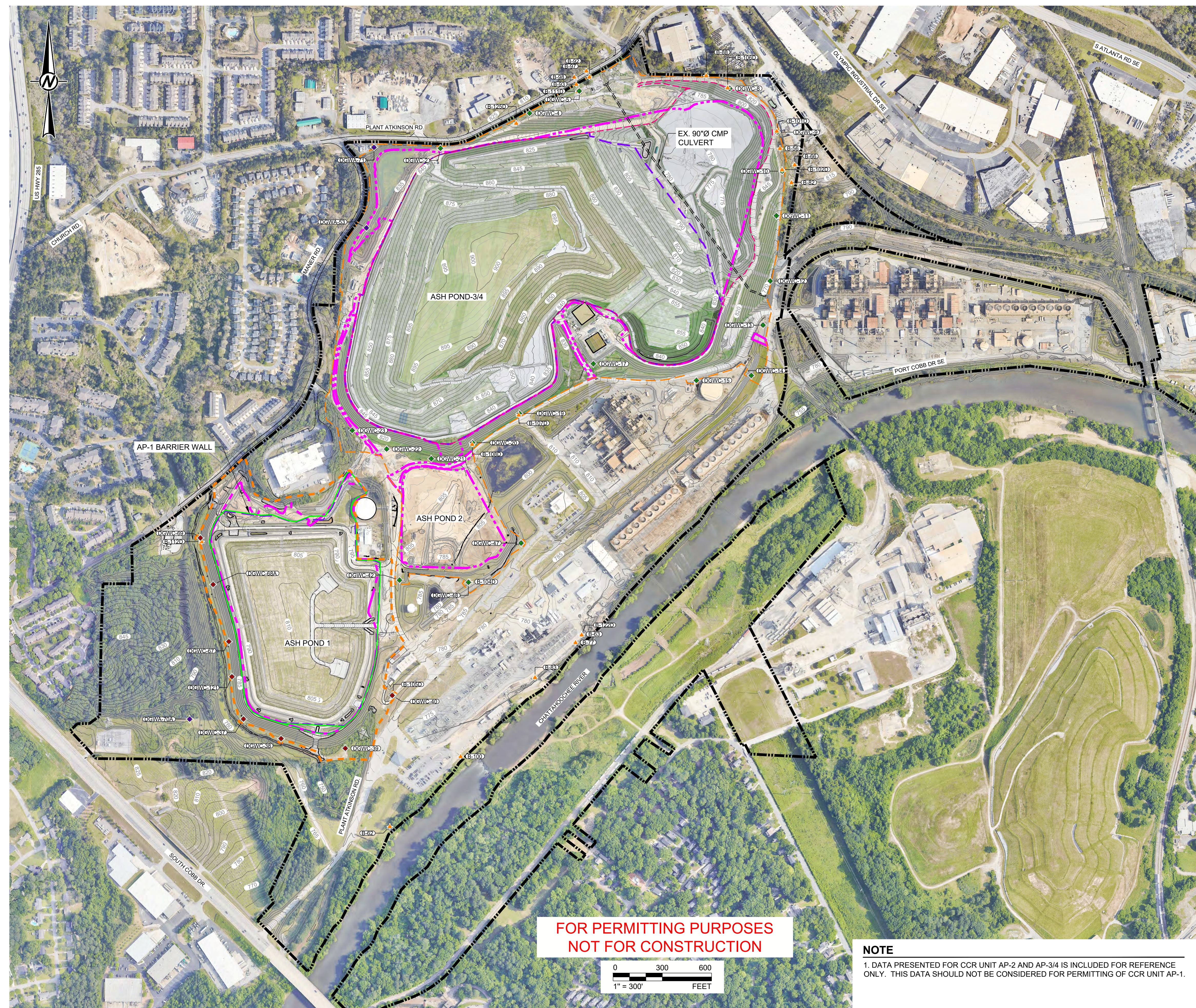
- 1. Coordinate System: NAD 1983 State Plane Georgia West (U.S. feet)
- 2. bgs - Below Ground Surface; NAD - North American Datum; NAVD - North American Vertical Datum
- 3. Ground surface elevations shown are the elevation of the survey nail.
- 4. cm/sec - centimeters per second
- 5. Kv/Kh - Kv: vertical hydraulic conductivity; Kh: horizontal hydraulic conductivity
- 6. Data presented for CCR Units AP-2 and 3/4 are included for reference only. This data should not be considered for permitting of CCR Unit AP-1.
- 7. Piezometer B-84 abandoned on 4/28/2022
- 8. Piezometers B-31 and B-74 were decommissioned and abandoned in October 2023.


















## Figures






## LEGEND

- |   |  |
|---|--|
|   | EXISTING CONTOURS (SEE REFERENCE 2)                    |
|  | PROPERTY BOUNDARY (SEE REFERENCE 1)                    |
|  | APPROXIMATE PRE-CLOSURE CCR LIMITS                     |
|  | POST CLOSURE CCR LIMITS                                |
|  | FINAL COVER SYSTEM LIMITS                              |
|  | PERMIT BOUNDARY  |
|  | FUTURE BARRIER WALL OPTION A                           |
|  | FUTURE BARRIER WALL OPTION B                           |
|  | CROSS-SECTION LINES                                    |
|  | UPGRADIENT DETECTION MONITORING WELL (SEE REFERENCE 3) |
|  | AP-1 DETECTION MONITORING WELL (SEE REFERENCE 3)       |
|  | AP-2, 3/4 DETECTION MONITORING WELL (SEE REFERENCE 63) |
|  | ASSESSMENT WELL (SEE REFERENCE 3, 4 AND 5)             |

## REFERENCES

1. APPROXIMATE PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY SERVICES (2017).
2. THE EXISTING TOPOGRAPHY, AND CONTOUR ELEVATIONS FOR THE ASH PONDS 1 THROUGH 4 AREAS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022, AERIAL IMAGERY DATE FOR AP-3/4 PROVIDED BY GEORGIA POWER IS MAY 24, 2023, AND FOR AP-1, AP-2 AND SURROUNDING AREAS OF AP- 3/4, SOURCED BY PLEXEARTH, IS SEPTEMBER 28, 2023. THE TOPOGRAPHIC CONTOUR INTERVALS IS 1 FOOT.  
THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS FOR THE SURROUNDING AREAS OF ASH PONDS 1 THROUGH 4 WERE PROVIDED BY GEORGIA LAND DEPARTMENT AND METRO ENGINEERING AND SURVEYING CO. INC. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, AT THE SURROUNDING AREAS, IS 03-18-2018. REFER TO THE SURVEY DRAWING TITLED "TOPOGRAPHIC MAP PREPARED FOR GEORGIA POWER COMPANY PLANT MCDONOUGH - GEORGIA STATE PLANE WEST SURVEY FEET.
3. SCS PLANT MCDONOUGH HYDROGEOLOGICAL INVESTIGATION (2012 TO 2020).
4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020-2021.
5. WSP PLANT MCDONOUGH SUPPLEMENTAL INVESTIGATION (MAY 2023).
6. COORDINATES SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET); ELEVATIONS DISPLAY IN FEET REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 ( 1 FEET NAVD88).


	2023-12-06	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CRP	DAH	GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

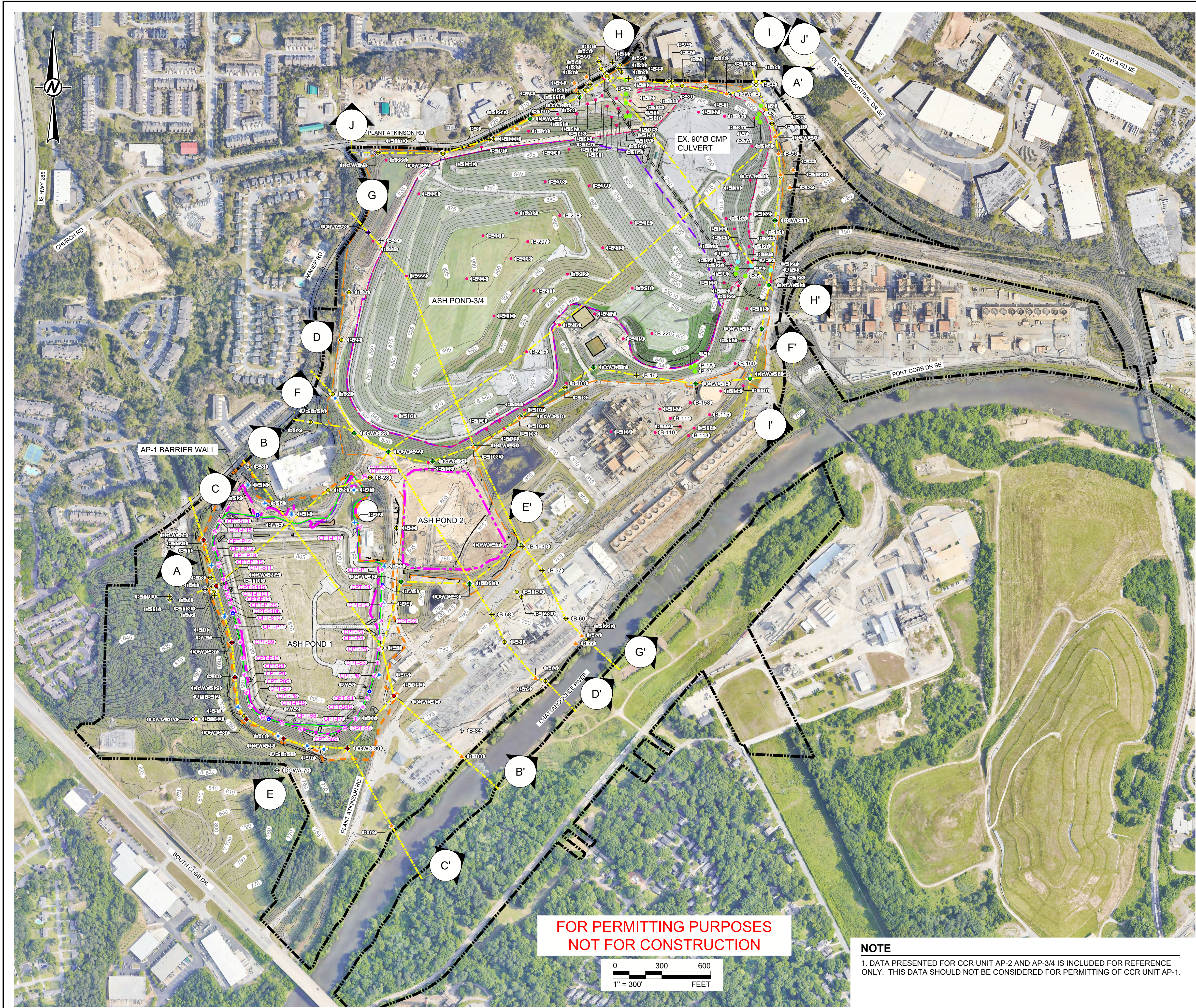
TITLE  
**DETECTION AND ASSESSMENT MONITORING WELL  
LOCATION MAP**

CONSULTANT	YYYY-MM-DD	2023-12-06
	DESIGNED	DLP
	PREPARED	CRP
	CHECKED	DAH
	REVIEWED / APPROVED	GLH

PROJECT NO. 1777449	REV. 0	SHEET GW-1
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1 in  
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D





- LEGEND**
- EXISTING CONTOURS (SEE REFERENCE 2)
  - PROPERTY BOUNDARY (SEE REFERENCE 1)
  - APPROXIMATE PRE-CLOSURE CCR LIMITS
  - POST CLOSURE CCR LIMITS
  - FINAL COVER SYSTEM LIMITS
  - PERMIT BOUNDARY
  - FUTURE BARRIER WALL OPTION A
  - FUTURE BARRIER WALL OPTION B
  - CROSS-SECTION LINES
  - UPGRADIENT DETECTION MONITORING WELL (SEE REFERENCE 6)
  - AP-1 DETECTION MONITORING WELL (SEE REFERENCE 6)
  - AP-2, 3/4 DETECTION MONITORING WELL (SEE REFERENCE 6)
  - ASSESSMENT WELL (SEE REFERENCE 6, 8 AND 9)
  - PIEZOMETER (SEE REFERENCE 6, 8 AND 9)
  - GOLDER BORINGS (SEE REFERENCE 7)
  - ABANDONED PIEZOMETER OR MONITORING WELL
  - WSP BORINGS (SEE REFERENCE 10)
  - GOLDER CPT 2021 (SEE REFERENCE 6)
  - LAW 1968 BORINGS (SEE REFERENCE 3)
  - P & W 1977 PIEZOMETERS (SEE REFERENCE 4)
  - AT&E 1981 BORINGS (SEE REFERENCE 5)

- REFERENCES**
- APPROXIMATE PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY SERVICES (2017).
  - THE EXISTING TOPOGRAPHY, AND CONTOUR ELEVATIONS FOR THE ASH PONDS 1 THROUGH 4 ARE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. AERIAL IMAGERY DATE FOR AP-3/4 PROVIDED BY GEORGIA POWER IS MAY 24, 2023, AND FOR AP-1, AP-2 AND SURROUNDING AREAS OF AP- 3/4, SOURCED BY PLEXEARTH, IS SEPTEMBER 28, 2023. THE TOPOGRAPHIC CONTOUR INTERVALS IS 1 FOOT. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS FOR THE SURROUNDING AREAS OF ASH PONDS 1 THROUGH 4 WERE PROVIDED BY GEORGIA LAND DEPARTMENT AND METRO ENGINEERING AND SURVEYING CO, INC. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, AT THE SURROUNDING AREAS, IS 03-18-2018. REFER TO THE SURVEY DRAWING TITLED "TOPOGRAPHIC MAP PREPARED FOR GEORGIA POWER COMPANY PLANT MCDONOUGH - GEORGIA STATE PLANE WEST SURVEY FEET.
  - LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT (LAW, 1968).
  - PATTERSON & DEWAR ENGINEERS, PIEZOMETER INSTALLATION REPORT (P&W, 1977).
  - ATLANTA TESTING AND ENGINEERING, GEOTECHNICAL REPORT (AT&E, 1981).
  - SCS PLANT MCDONOUGH HYDROGEOLOGICAL INVESTIGATION (2012 TO 2020).
  - GOLDER ASSOCIATES, PLANT MCDONOUGH SUPPLEMENTAL INVESTIGATION (2017-2023).
  - SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020-2021.
  - WSP PLANT MCDONOUGH SUPPLEMENTAL INVESTIGATION (MAY 2023).
  - PERIMETER BARRIER WALL DESIGN INVESTIGATION (WSP 2023).
  - COORDINATES SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET); ELEVATIONS DISPLAY IN FEET REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 ( FEET NAVD88).

2023/12/06	UPDATE AERIAL IMAGE 2023, ADD BW- & CPT- BORINGS: B-31,B-74, 84 ABAND.	DLP	CRP	DAH	GLH
2023/05/12	UPDATED TOPO & AERIAL, ADDITIONAL MONITORING WELLS	DLP	CRP	RNQ	GLH
2022/07/14	NOTE ADDED FOR AP1 DATA	LS	CRP	RPK	GLH
2022/02/15	REV. BARRIER WALL ALIGNMENT	DLP	RMS	RPK	GLH
2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	RPK	GLH
2020/10/20	PROJECT TITLE CHANGE; ADDED CROSS SECTIONS F, G, H, I, J, UPDATED DATA	DLP	CCP	BAS	TIR / GLH
2020/03/06	UPDATED CCR LIMITS & AERIAL, REV NOTE 8	VPM	VPM	JRJ	TIR / GLH
2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	DES	CADD	CHK	RWV

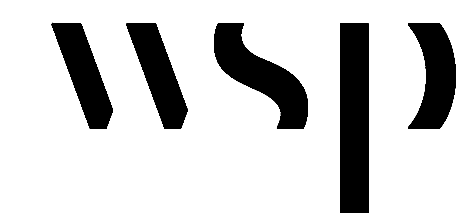
CLIENT  
**GEORGIA POWER COMPANY**  
**PLANT MCDONOUGH**



PROJECT  
**HYDROGEOLOGIC ASSESSMENT REPORT (HAR)**  
**PLANT MCDONOUGH-ATKINSON**  
**ASH POND 1**

TITLE  
**MONITORING WELL, PIEZOMETER, SOIL BORING & CPT**  
**LOCATION MAP WITH SECTION PROFILES**

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	



PROJECT NO.  
**1777449**

REV.  
**7**

SHEET  
**GW-1a**

**NOTE**  
1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

**FOR PERMITTING PURPOSES**  
**NOT FOR CONSTRUCTION**

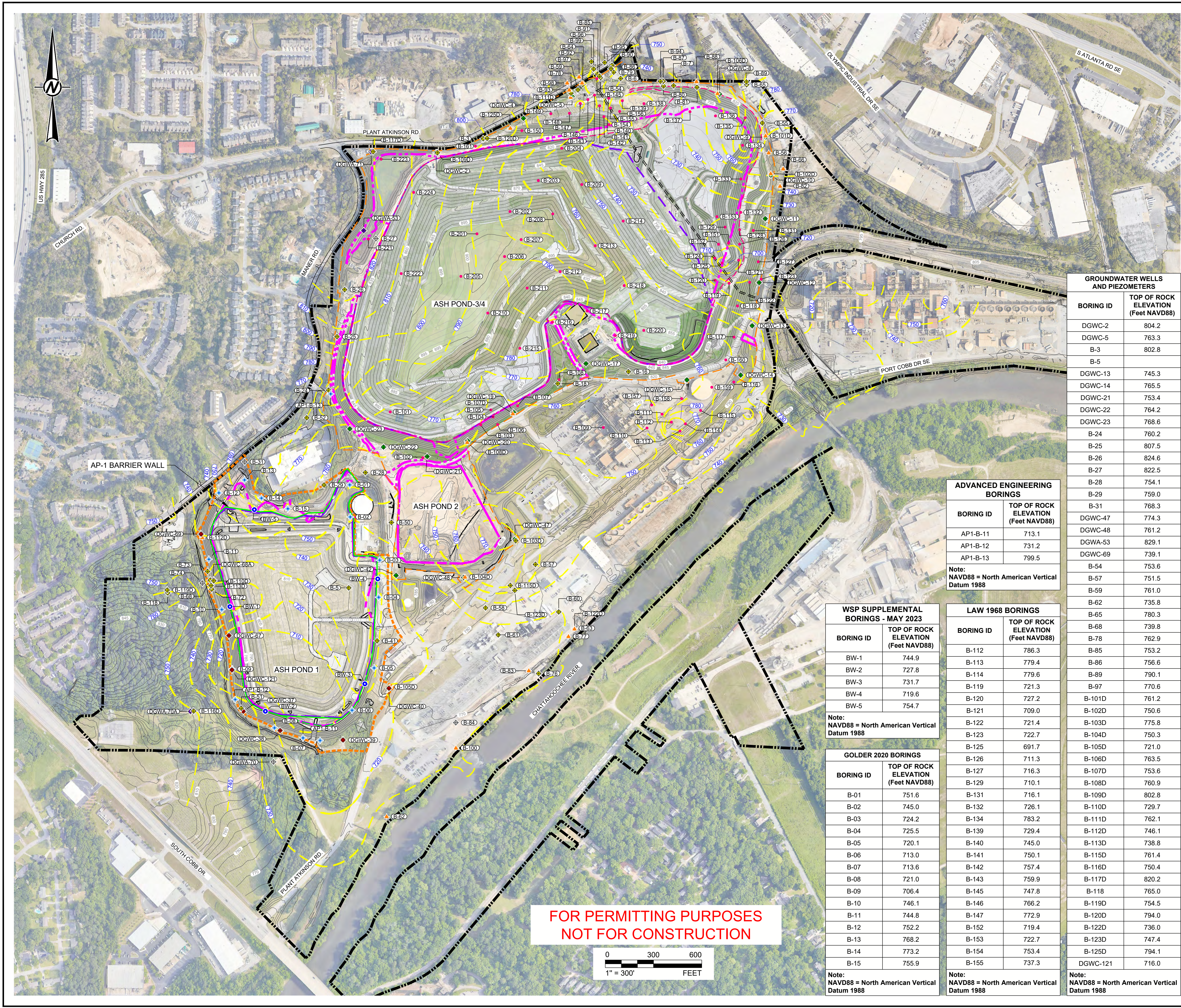


IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D









### LEGEND

- 880 EXISTING CONTOURS (SEE REFERENCE 2)
- PROPERTY BOUNDARY (SEE REFERENCE 1)
- APPROXIMATE PRE-CLOSURE CCR LIMITS
- POST CLOSURE CCR LIMITS
- FINAL COVER SYSTEM LIMITS
- PERMIT BOUNDARY
- FUTURE BARRIER WALL OPTION A
- FUTURE BARRIER WALL OPTION B
- ESTIMATED TOP OF ROCK SURFACE CONTOURS (NAVD88)
- UPGRADIENT DETECTION MONITORING WELL (SEE REFERENCE 4)
- AP-1 DETECTION MONITORING WELL (SEE REFERENCE 4)
- AP-2, 3/4 DETECTION MONITORING WELL (SEE REFERENCE 4)
- ASSESSMENT WELLS (SEE REFERENCE 4, 6 AND 7)
- PIEZOMETER (SEE REFERENCE 4, 6 AND 7)
- GOLDER BORINGS (SEE REFERENCE 5)
- ABANDONED PIEZOMETER OR MONITORING WELL
- WSP BORING (SEE REFERENCE 8)
- B-202 LAW 1968 BORINGS (SEE REFERENCE 3)

### NOTES

- TOP OF ROCK SURFACE CONTOUR INTERVAL = 10 FEET.
- BEDROCK CONTOURS ARE ESTIMATED BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATA, TOPOGRAPHIC CONTOURS, KNOWN FIELD CONDITIONS, AND PROFESSIONAL JUDGEMENT.
- DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

### REFERENCES

- APPROXIMATE PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY SERVICES (2017).
- THE EXISTING TOPOGRAPHY, AND CONTOUR ELEVATIONS FOR THE ASH PONDS 1 THROUGH 4 AREAS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. AERIAL IMAGERY DATE FOR AP-3/4 PROVIDED BY GEORGIA POWER IS MAY 24, 2023, AND FOR AP-1, AP-2 AND SURROUNDING AREAS OF AP- 3/4, SOURCED BY PLEXEARTH, IS SEPTEMBER 28, 2023. THE TOPOGRAPHIC CONTOUR INTERVALS IS 1 FOOT. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS FOR THE SURROUNDING AREAS OF ASH PONDS 1 THROUGH 4 WERE PROVIDED BY GEORGIA LAND DEPARTMENT AND METRO ENGINEERING AND SURVEYING CO. INC. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, AT THE SURROUNDING AREAS, IS 03-18-2018. REFER TO THE SURVEY DRAWING TITLED "TOPOGRAPHIC MAP PREPARED FOR GEORGIA POWER COMPANY PLANT MCDONOUGH - GEORGIA STATE PLANE WEST SURVEY FEET.
- LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT (LAW, 1968).
- SCS PLANT MCDONOUGH HYDROGEOLOGICAL INVESTIGATIONS (2012 TO 2020).
- GOLDER ASSOCIATES, PLANT MCDONOUGH SUPPLEMENTAL INVESTIGATION (2017-2023).
- SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.
- WSP PLANT MCDONOUGH SUPPLEMENTAL INVESTIGATION (MAY 2023).
- PERIMETER BARRIER WALL DESIGN INVESTIGATION (WSP 2023).
- COORDINATES SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET); ELEVATIONS DISPLAY IN FEET REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 (FEET NAVD88).

GROUNDWATER WELLS AND PIEZOMETERS	
BORING ID	TOP OF ROCK ELEVATION (Feet NAVD88)
DGWC-2	804.2
DGWC-5	763.3
B-3	802.8
B-5	
DGWC-13	745.3
DGWC-14	765.5
DGWC-21	753.4
DGWC-22	764.2
DGWC-23	768.6
B-24	760.2
B-25	807.5
B-26	824.6
B-27	822.5
B-28	754.1
B-29	759.0
B-31	768.3
DGWC-47	774.3
DGWC-48	761.2
DGWA-53	829.1
DGWC-69	739.1
B-54	753.6
B-57	751.5
B-59	761.0
B-62	735.8
B-65	780.3
B-68	739.8
B-78	762.9
B-85	753.2
B-86	756.6
B-89	790.1
B-97	770.6
B-101D	761.2
B-102D	750.6
B-103D	775.8
B-104D	750.3
B-105D	721.0
B-106D	763.5
B-107D	753.6
B-108D	760.9
B-109D	802.8
B-110D	729.7
B-111D	762.1
B-112D	746.1
B-113D	738.8
B-115D	761.4
B-116D	750.4
B-117D	820.2
B-118	765.0
B-119D	754.5
B-120D	794.0
B-122D	736.0
B-123D	747.4
B-125D	794.1
DGWC-121	716.0

ADVANCED ENGINEERING BORINGS	
BORING ID	TOP OF ROCK ELEVATION (Feet NAVD88)
AP1-B-11	713.1
AP1-B-12	731.2
AP1-B-13	799.5

Note: NAVD88 = North American Vertical Datum 1988

WSP SUPPLEMENTAL BORINGS - MAY 2023	
BORING ID	TOP OF ROCK ELEVATION (Feet NAVD88)
BW-1	744.9
BW-2	727.8
BW-3	731.7
BW-4	719.6
BW-5	754.7

Note: NAVD88 = North American Vertical Datum 1988

GOLDER 2020 BORINGS	
BORING ID	TOP OF ROCK ELEVATION (Feet NAVD88)
B-01	751.6
B-02	745.0
B-03	724.2
B-04	725.5
B-05	720.1
B-06	713.0
B-07	713.6
B-08	721.0
B-09	706.4
B-10	746.1
B-11	744.8
B-12	752.2
B-13	768.2
B-14	773.2
B-15	755.9

Note: NAVD88 = North American Vertical Datum 1988

LAW 1968 BORINGS	
BORING ID	TOP OF ROCK ELEVATION (Feet NAVD88)
B-112	786.3
B-113	779.4
B-114	779.6
B-119	721.3
B-120	727.2
B-121	709.0
B-122	721.4
B-123	722.7
B-125	691.7
B-126	711.3
B-127	716.3
B-129	710.1
B-131	716.1
B-132	726.1
B-134	783.2
B-139	729.4
B-140	745.0
B-141	750.1
B-142	757.4
B-143	759.9
B-145	747.8
B-146	766.2
B-147	772.9
B-152	719.4
B-153	722.7
B-154	753.4
B-155	737.3

Note: NAVD88 = North American Vertical Datum 1988

CLIENT	
GEORGIA POWER COMPANY PLANT MCDONOUGH	
PROJECT	
HYDROGEOLOGIC ASSESSMENT REPORT (HAR) PLANT MCDONOUGH-ATKINSON ASH POND 1	
TITLE	
ESTIMATED TOP OF ROCK MAP	
CONSULTANT	
YYYY-MM-DD 2023-12-06	
DESIGNED	
DLP	
PREPARED	
CRP	
CHECKED	
DAH	
REVIEWED / APPROVED	
GLH	

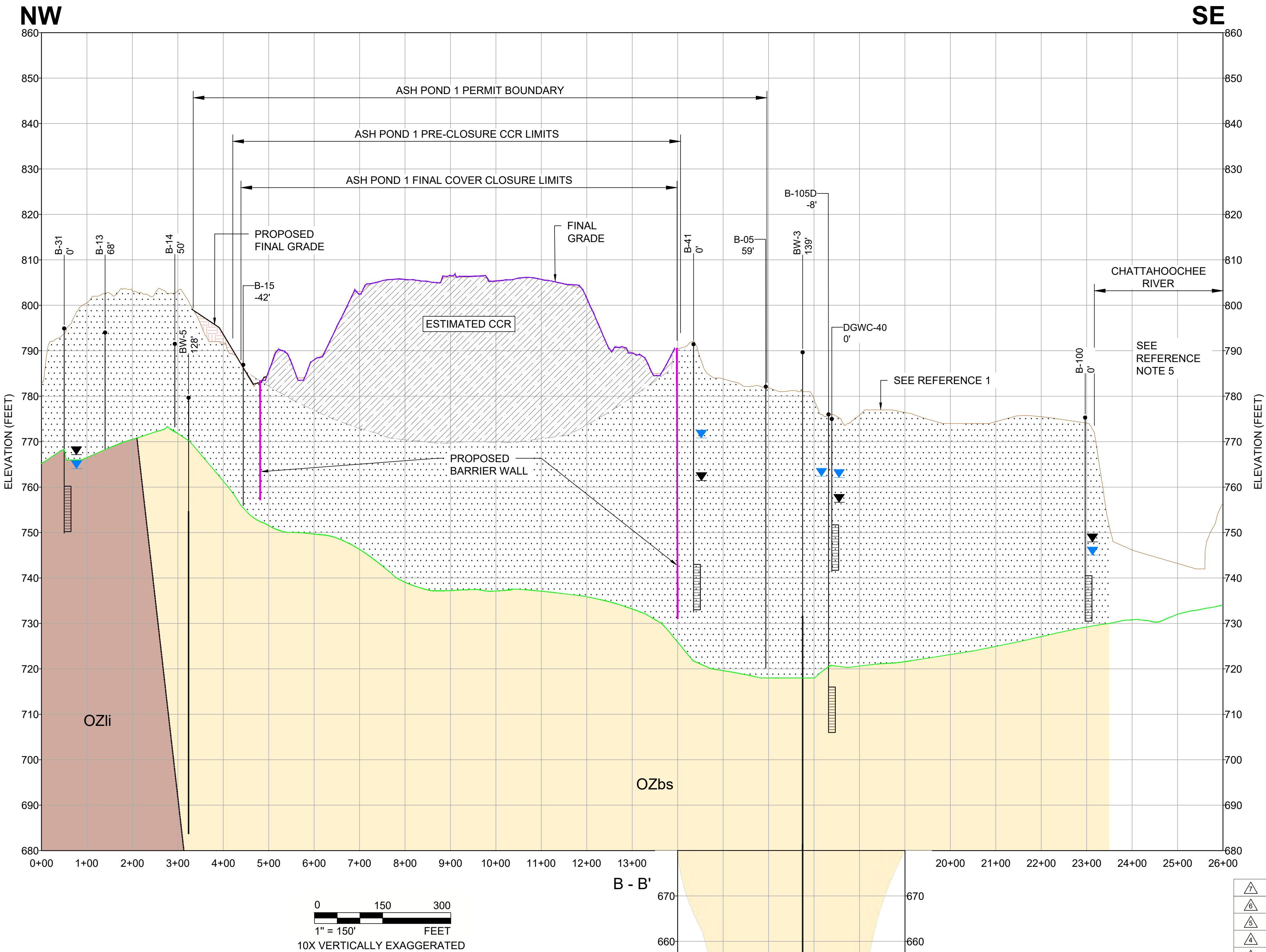
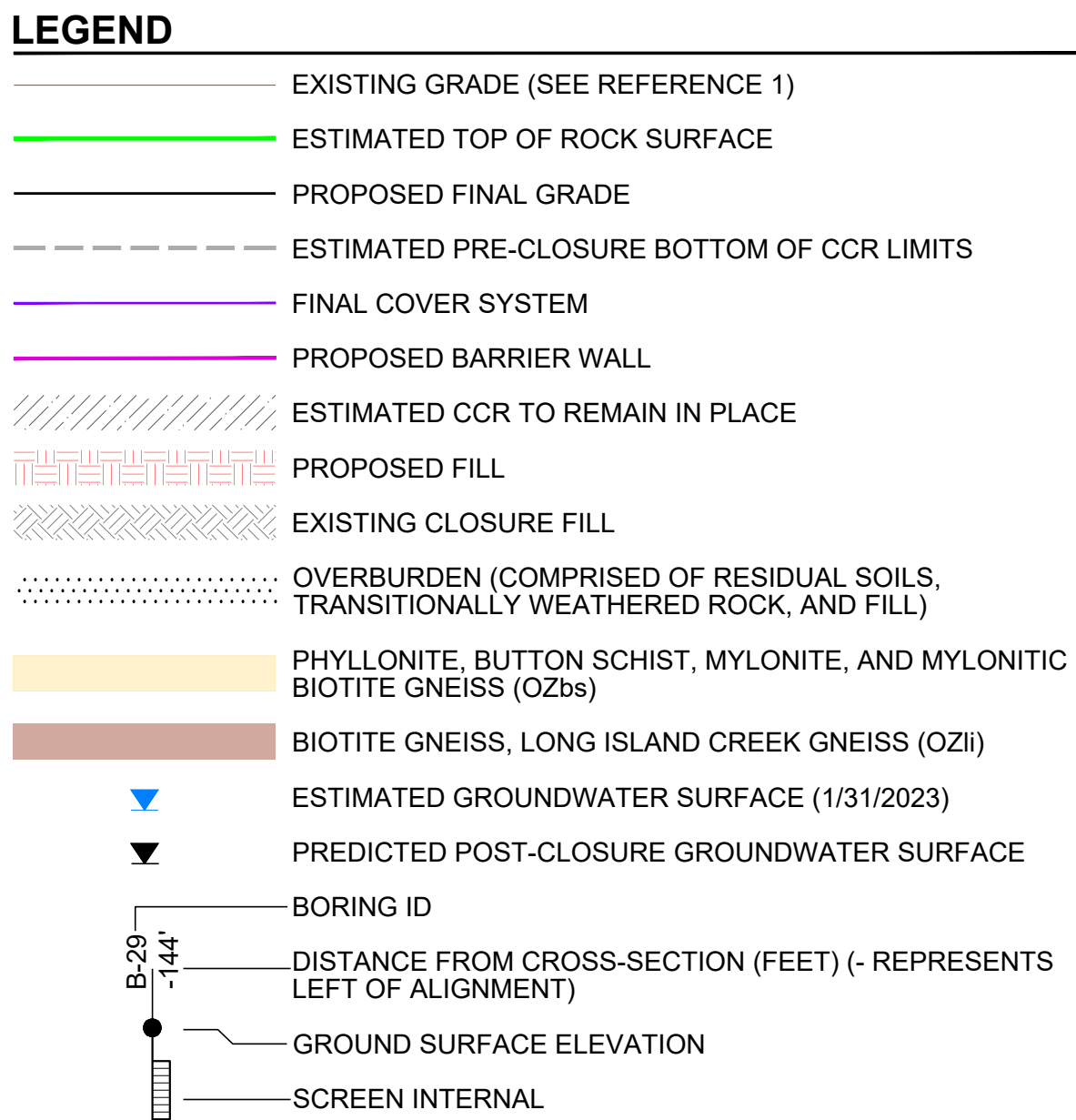
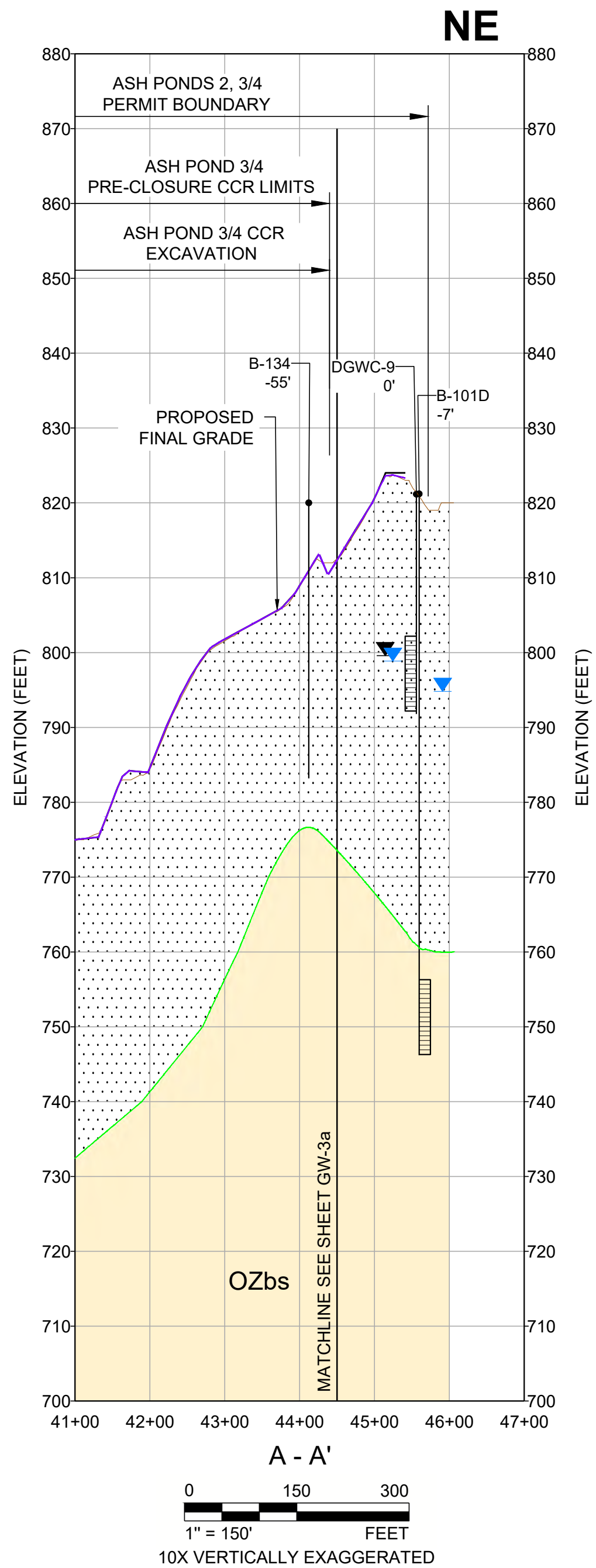
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D  
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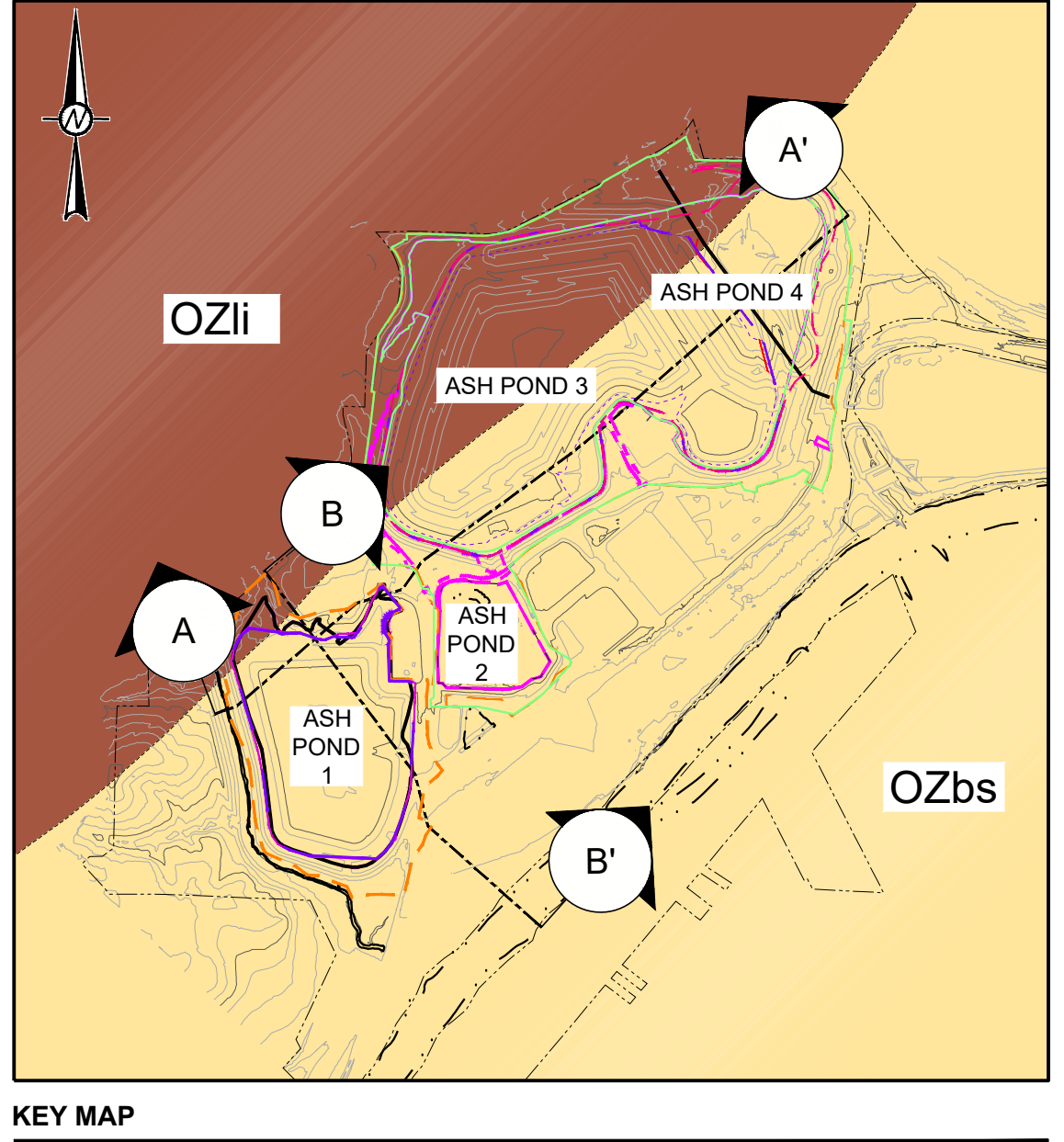










Path: \\atlanta\CADD\Southern Company\1777449 Plant McDonough Permitting\HAR\Production AP-1 File Name: GW-3 AP-1 GEOLOGIC CROSS-SECTIONS.dwg



- NOTE**
1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.
- REFERENCES**
1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.
2. BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1968 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.
3. GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.
4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.
5. NO AVAILABLE SUBSURFACE GEOLOGIC DATA.

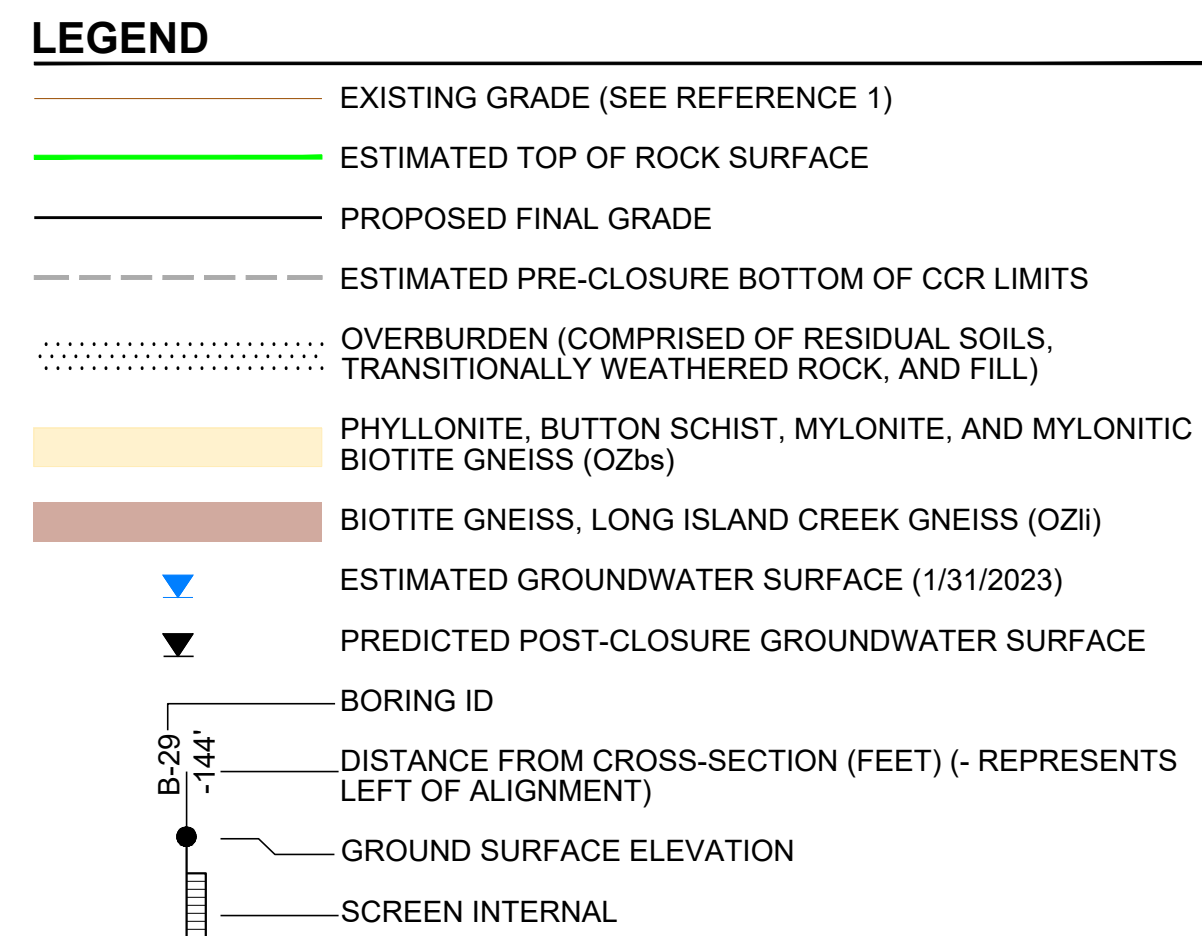
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NOT FOR CONSTRUCTION



	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK SURFACE TO INCLUDE BORINGS SINCE 2021	DLP	CRP	DAH	GLH
	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/02/15	WATER LEVEL UPDATED TO 10/2021	DLP	RMS	RPK	GLH
	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
	2020/10/20	PROJECT TITLE CHANGE, UPDATED DATA	DLP	CCP	BAS	TIR / GLH
	2020/03/06	DWG CHANGED FROM GW-5B TO GW-3B; UPDATED CCR LIMITS & AERIAL	VPM	VPM	JRJ	TIR / GLH
	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW









CLIENT			Georgia Power		
GEORGIA POWER COMPANY			PLANT MCDONOUGH		
PROJECT			HYDROGEOLOGIC ASSESSMENT REPORT (HAR)		
			PLANT MCDONOUGH-ATKINSON		
			ASH POND 1		
TITLE			GEOLOGIC CROSS-SECTION SCHEMATIC A-A' AND B-B'		
			SHEET 2		
CONSULTANT			YYYY-MM-DD	2023-12-06	
			DESIGNED	DLP	
			PREPARED	CRP	
			CHECKED	DAH	
			REVIEWED / APPROVED	GLH	
PROJECT NO.			REV.	SHEET	
1777449			7	GW-3b	






A map of the Ozli and Ozbs areas. The map shows a large area with a brown background and a yellow background. A north arrow is located in the top left corner. The map is divided into two main sections: 'Ozli' on the left and 'Ozbs' on the right. Four ash ponds are labeled: 'ASH POND 1', 'ASH POND 2', 'ASH POND 3', and 'ASH POND 4'. Two creeks are labeled: 'C' and 'C''. The map also shows various roads and boundaries.

5. NO AVAILABLE SUBSURFACE GEOLOGIC DATA.

	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK SURFACE TO INCLUDE BORINGS SINCE 2021	DLP	CRP	DAH	GLH
	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/02/15	WATER LEVEL UPDATED TO 10/2021	DLP	RMS	RPK	GLH
	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
	2020/10/20	PROJECT TITLE CHANGE, UPDATED DATA	DLP	CCP	BAS	TIR / GLH
	2020/03/06	DWG CHANGED FROM GW-5C TO GW-3C; UPDATED CCR LIMITS & AERIAL	VPM	VPM	JRJ	TIR / GLH
	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW



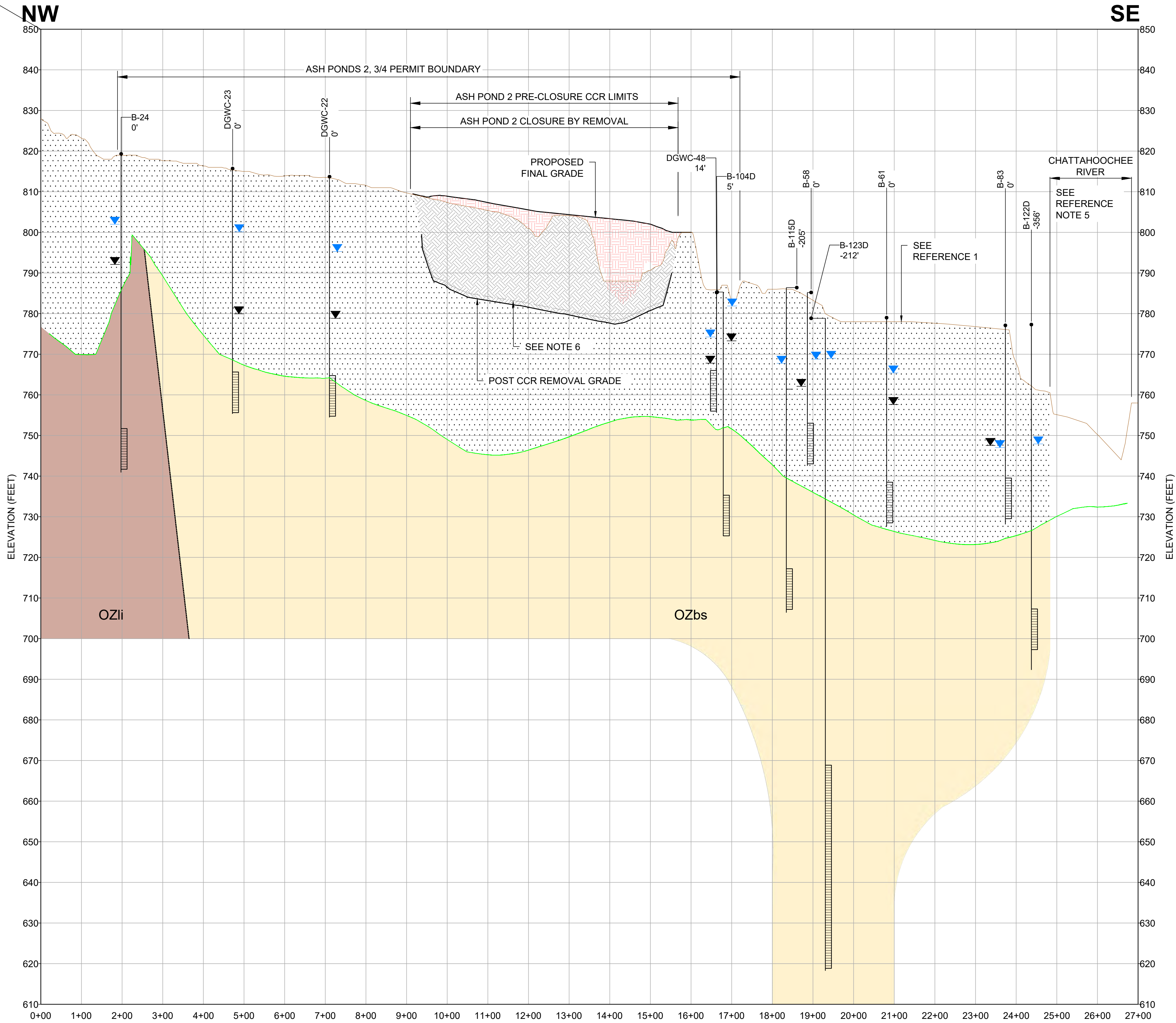
CONSULTANT	YYYY-MM-DD	2023-12-06
	DESIGNED	DLP
	PREPARED	CRP
	CHECKED	DAH
	REVIEWED / APPROVED	GLH

PROJECT NO. 1777449	REV. 7	SHEET <b>GW-3c</b>
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#### REFERENCES

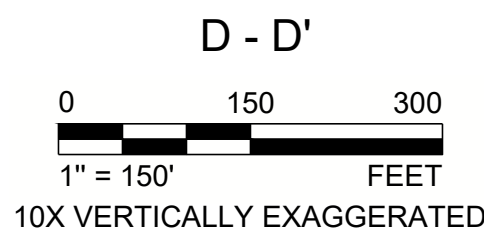
1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.

2. BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1988 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.

3. GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.

4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.

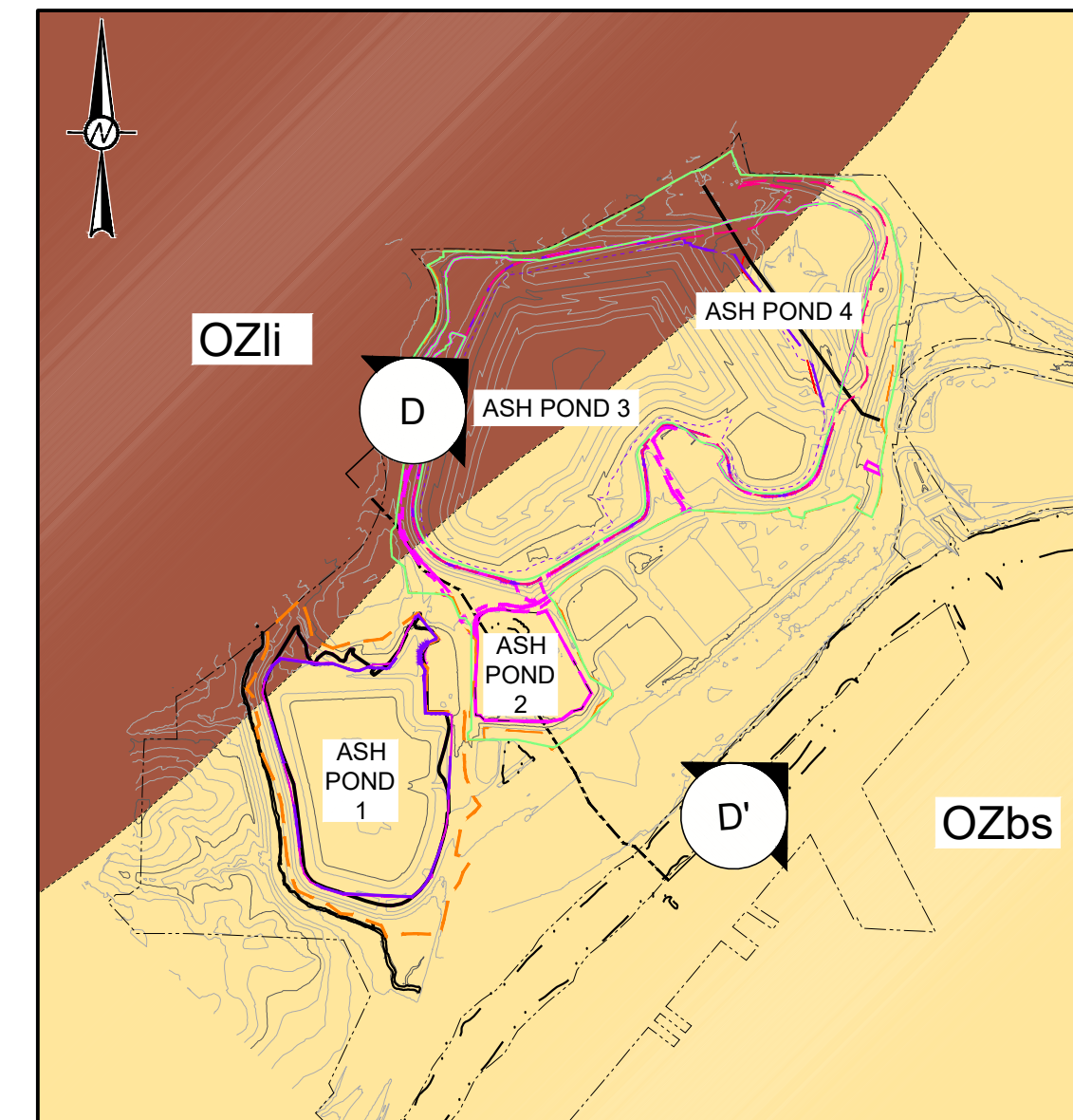
5. NO AVAILABLE SUBSURFACE GEOLOGIC DATA.



#### NOTE

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.









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NOT FOR CONSTRUCTION**



KEY MAP

#### LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- PROPOSED FILL
- EXISTING CLOSURE FILL
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK SURFACE TO INCLUDE BORINGS SINCE 2021	DLP	CRP	DAH	GLH
	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/02/15	WATER LEVEL UPDATED TO 10/2021	DLP	RMS	RPK	GLH
	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
	2020/10/20	PROJECT TITLE CHANGE, UPDATED DATA	DLP	CCP	BAS	TIR / GLH
	2020/03/06	DWG CHANGED FROM GW-5D TO GW-3D; UPDATED CCR LIMITS & AERIAL	VPM	VPM	JRJ	TIR / GLH
	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
**GEOLOGIC CROSS-SECTION SCHEMATIC D-D'**  
**SHEET 4**

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	

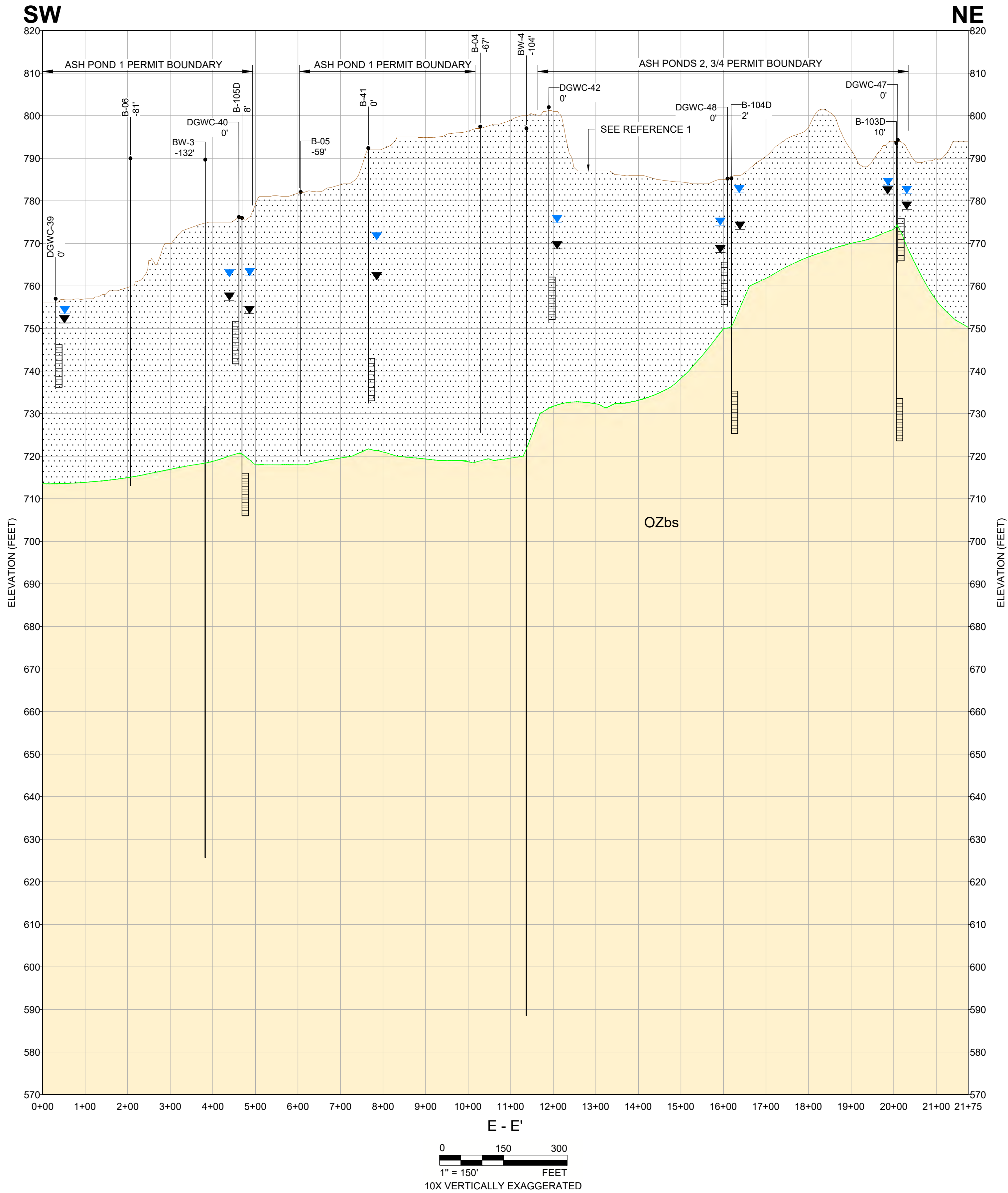
PROJECT NO.  
1777449

REV.  
7

SHEET  
GW-3d

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LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

NOTE

1. DATA PRESENTED FOR CCR UNIT AP-1 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-2 AND AP-3/4.

REFERENCES

1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.

2. BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1968 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.

3. GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.

4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.

△	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK SURFACE TO INCLUDE BORINGS SINCE 2021	DLP	CRP	DAH	GLH
△	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
△	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
△	2022/02/15	WATER LEVEL UPDATED TO 10/2021	DLP	RMS	RPK	GLH
△	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
△	2020/10/20	PROJECT TITLE CHANGE, UPDATED DATA	DLP	CCP	BAS	TIR / GLH
△	2020/03/06	DWG CHANGED FROM GW-5E TO GW-3E; UPDATED CCR LIMITS & AERIAL	VPM	VPM	JRJ	TIR / GLH
△	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	R/W

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
GEOLOGIC CROSS-SECTION SCHEMATIC E-E'  
SHEET 5

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	



PROJECT NO.  
1777449

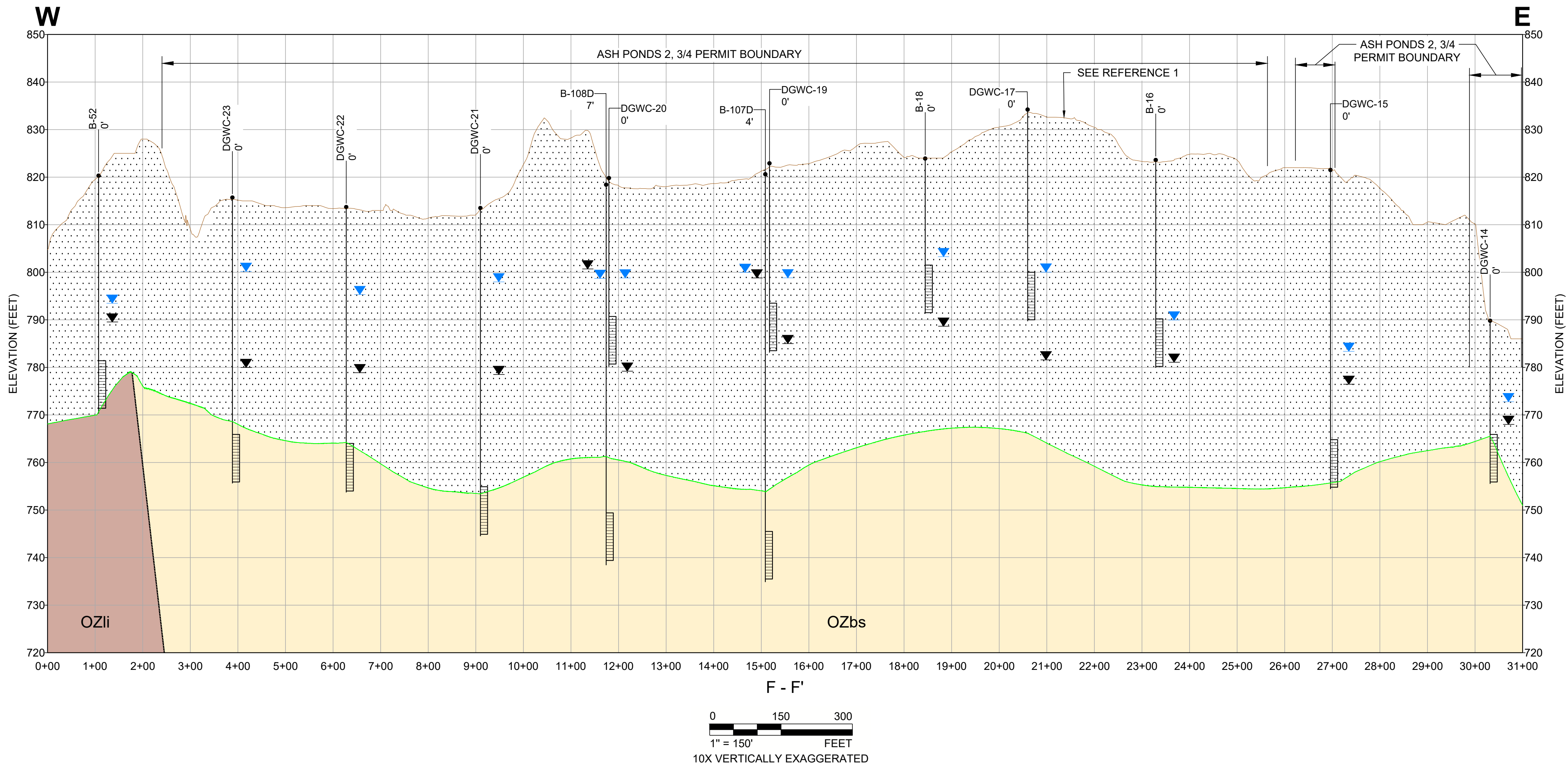
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SHEET  
GW-3e

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION

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#### LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

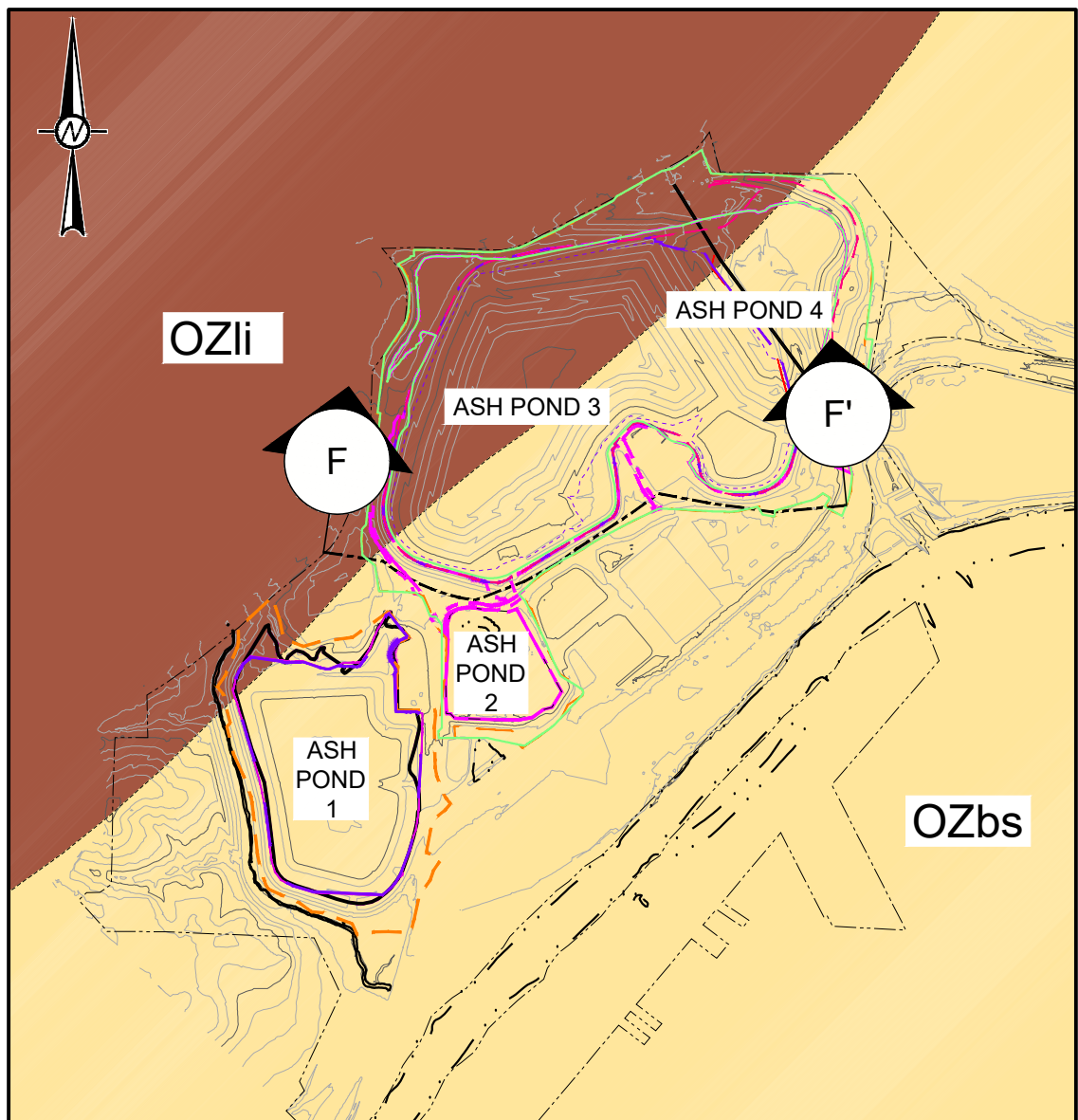
#### NOTE

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

#### REFERENCES

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- GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.
- SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION



△	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK TO INCLUDE BORINGS SINCE 2021	DLP	CRP	RNQ	RNQ
△	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
△	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
△	2022/02/15	WATER LEVELS UPDATE 10/2021	DLP	RMS	RKP	GHL
△	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
△	2020/10/20	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CCP	BAS	TIR / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWV

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
GEOLOGIC CROSS-SECTION SCHEMATIC F-F'  
SHEET 6

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	

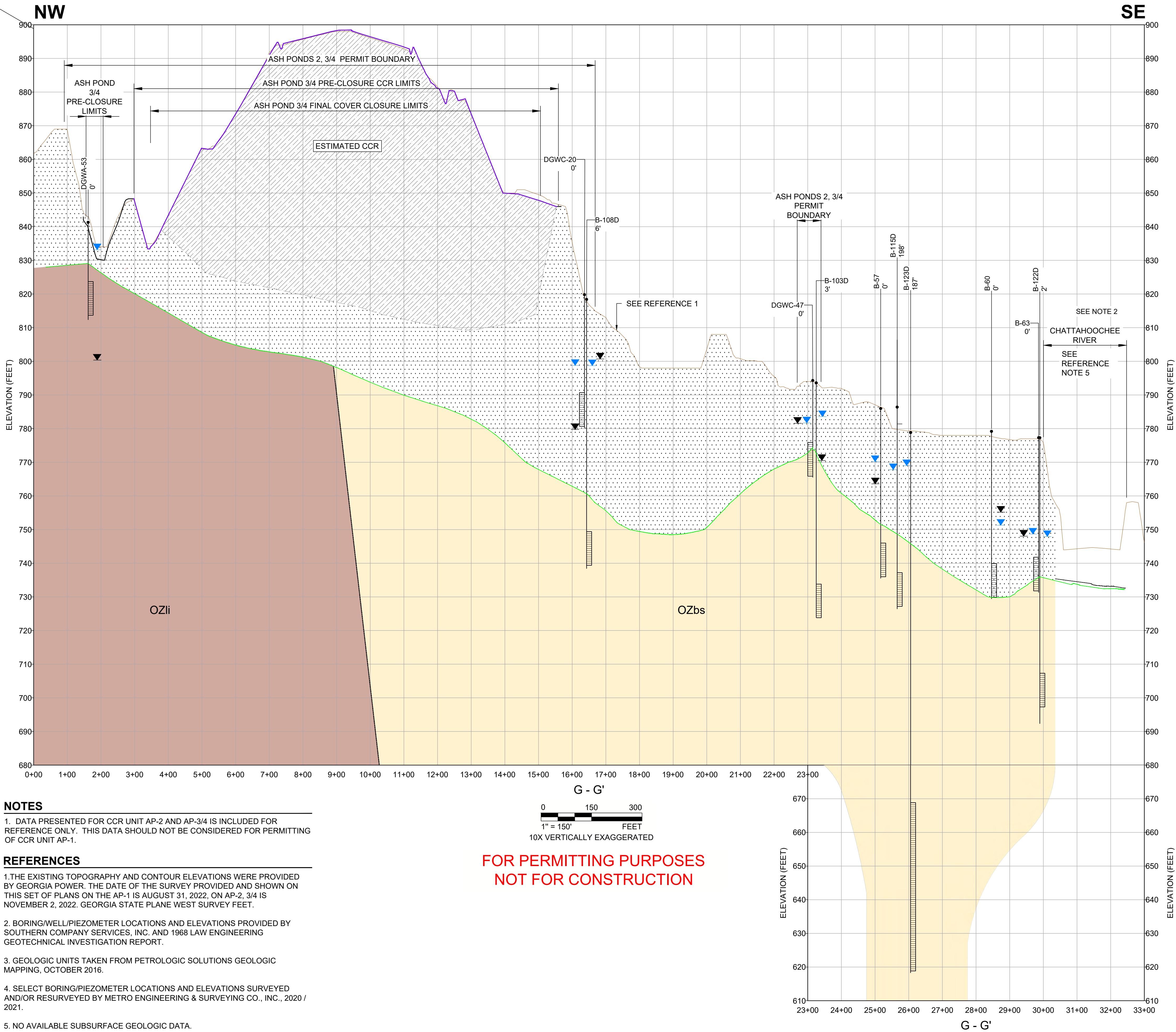
PROJECT NO.  
1777449

REV.  
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SHEET  
GW-3f

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D



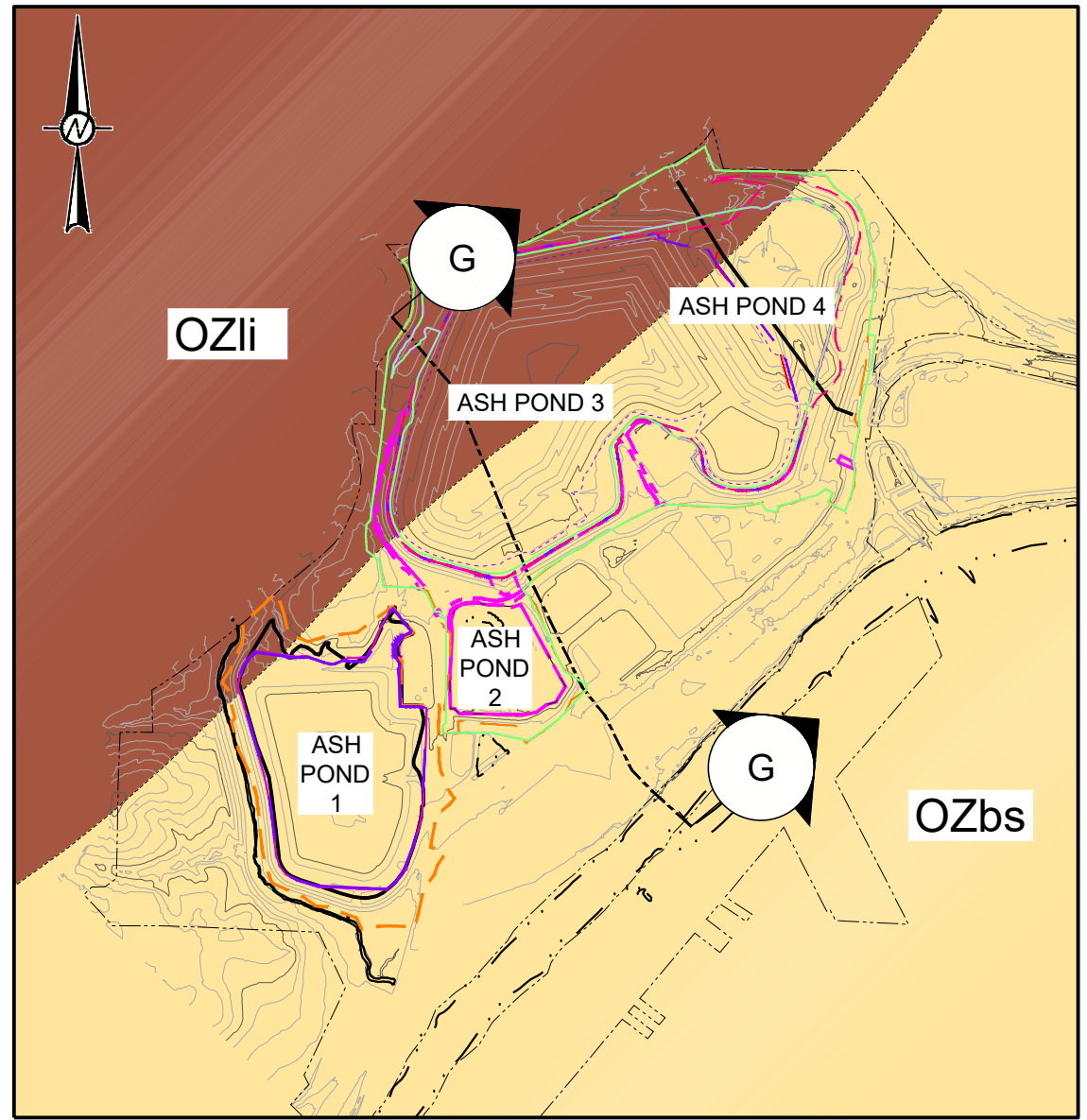


#### NOTES

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

#### REFERENCES

- THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.
- BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1988 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.
- GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.
- SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.
- NO AVAILABLE SUBSURFACE GEOLOGIC DATA.



#### LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- FINAL COVER SYSTEM
- ESTIMATED CCR TO REMAIN IN PLACE
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

△	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK TO INCLUDE BORINGS SINCE 2021	DLP	CRP	RNQ	RNQ
△	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
△	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
△	2022/02/15	WATER LEVELS UPDATE 10/2021	DLP	RMS	RKP	GHL
△	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
△	2020/10/20	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CCP	BAS	TIR / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
**GEOLOGIC CROSS-SECTION SCHEMATIC G-G'**  
**SHEET 7**

CONSULTANT	YYYY-MM-DD	2023-12-06
	DESIGNED	DLP
	PREPARED	CRP
	CHECKED	DAH
	REVIEWED / APPROVED	GLH

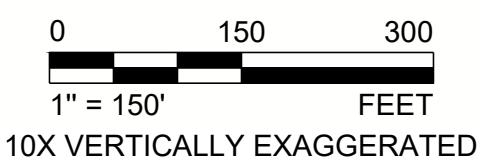
PROJECT NO.  
1777449

REV.  
5

SHEET  
GW-3g

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D





EXISTING GRADE (SEE REFERENCE 1)

ESTIMATED TOP OF ROCK SURFACE

PROPOSED FINAL GRADE

ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS

FINAL COVER SYSTEM

PROPOSED FILL

OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)

PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)

BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)

ESTIMATED GROUNDWATER SURFACE (1/31/2023)

PREDICTED POST-CLOSURE GROUNDWATER SURFACE

BORING ID

DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)







GROUND SURFACE ELEVATION

SCREEN INTERNAL

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER, THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.
2. BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1968 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.
3. GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.
4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.

## KEY MAP


	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK TO INCLUDE BORINGS SINCE 2021	DLP	CRP	RNQ	RNQ
	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/02/15	WATER LEVELS UPDATE 10/2021	DLP	RMS	RKP	GHL
	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
	2020/10/20	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CDD	BAS	TIR / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
**GEOLOGIC CROSS-SECTION SCHEMATIC H-H'  
SHEET 8**

CONSULTANT	YYYY-MM-DD	2023-12-06
	DESIGNED	DLP
	PREPARED	CRP
	CHECKED	DAH
	REVIEWED / APPROVED	GLH

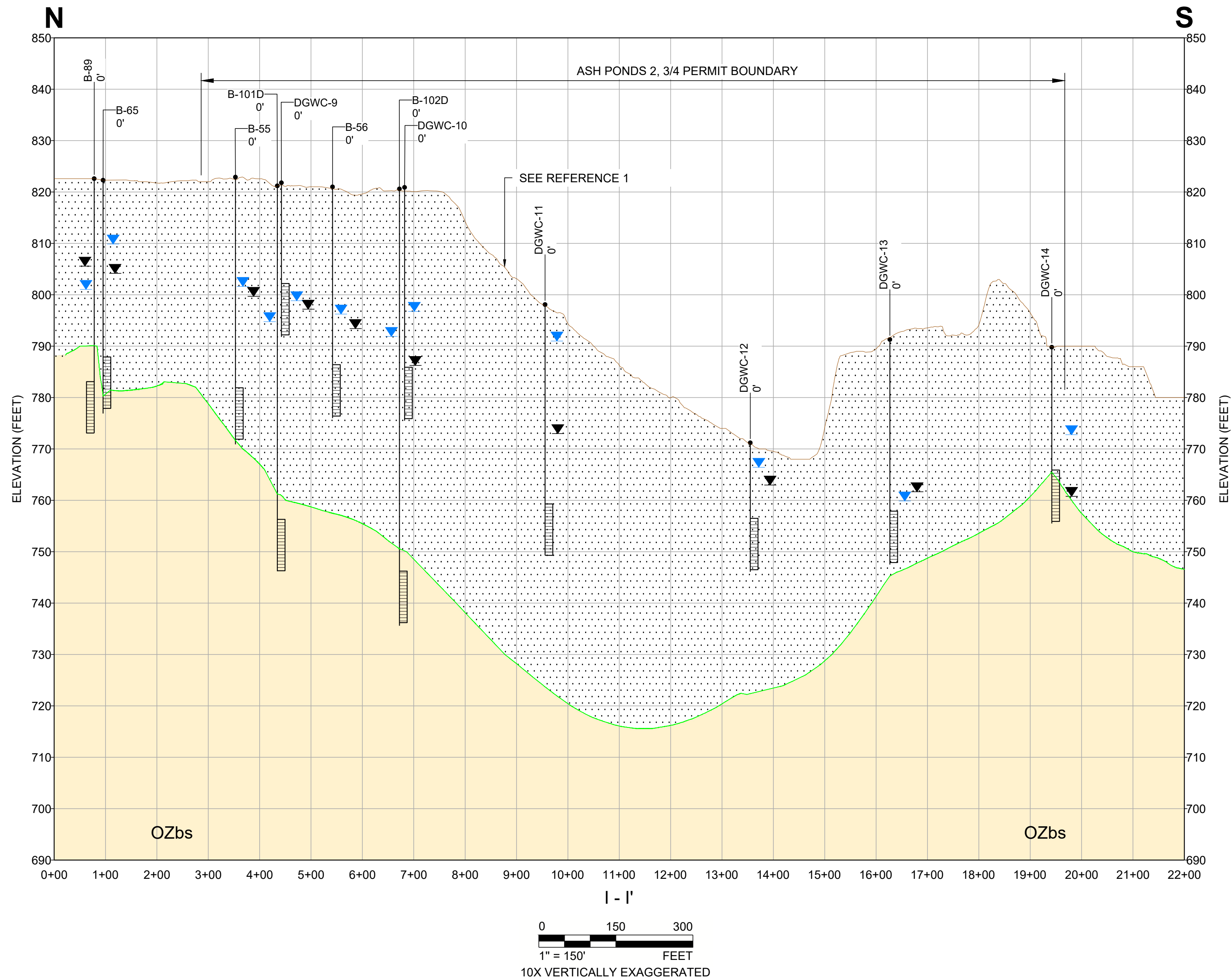
PROJECT NO.  
1777449

REV.  
5

SHEET  
GW-3h

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D





LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

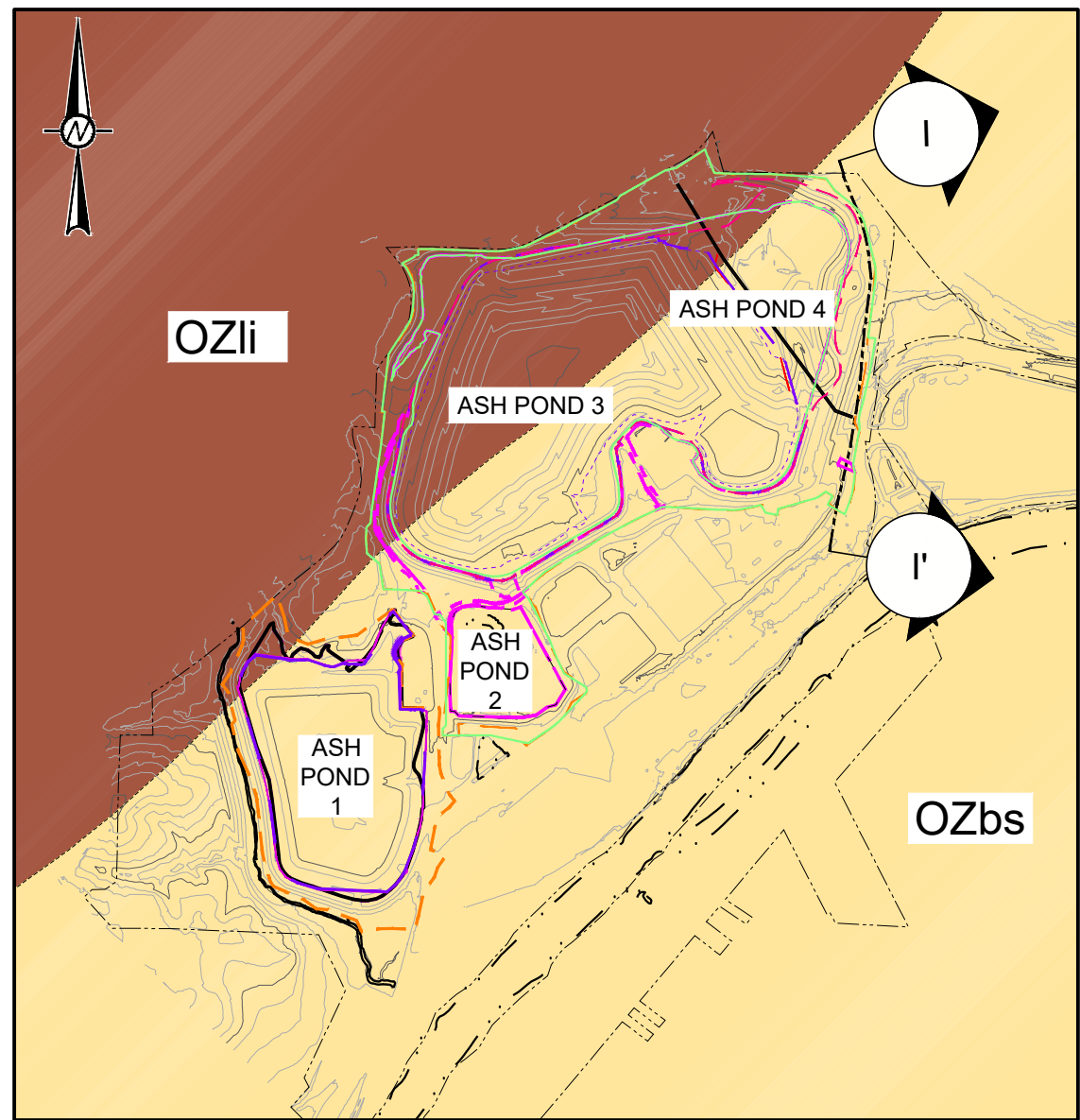
NOTE







1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

REFERENCES

- THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.
- BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1988 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.
- GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.
- SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION



	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK TO INCLUDE BORINGS SINCE 2021	DLP	CRP	RNQ	RNQ
	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/02/15	WATER LEVELS UPDATE 10/2021	DLP	RMS	RKP	GHL
	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
	2020/10/20	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CCP	BAS	TIR / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



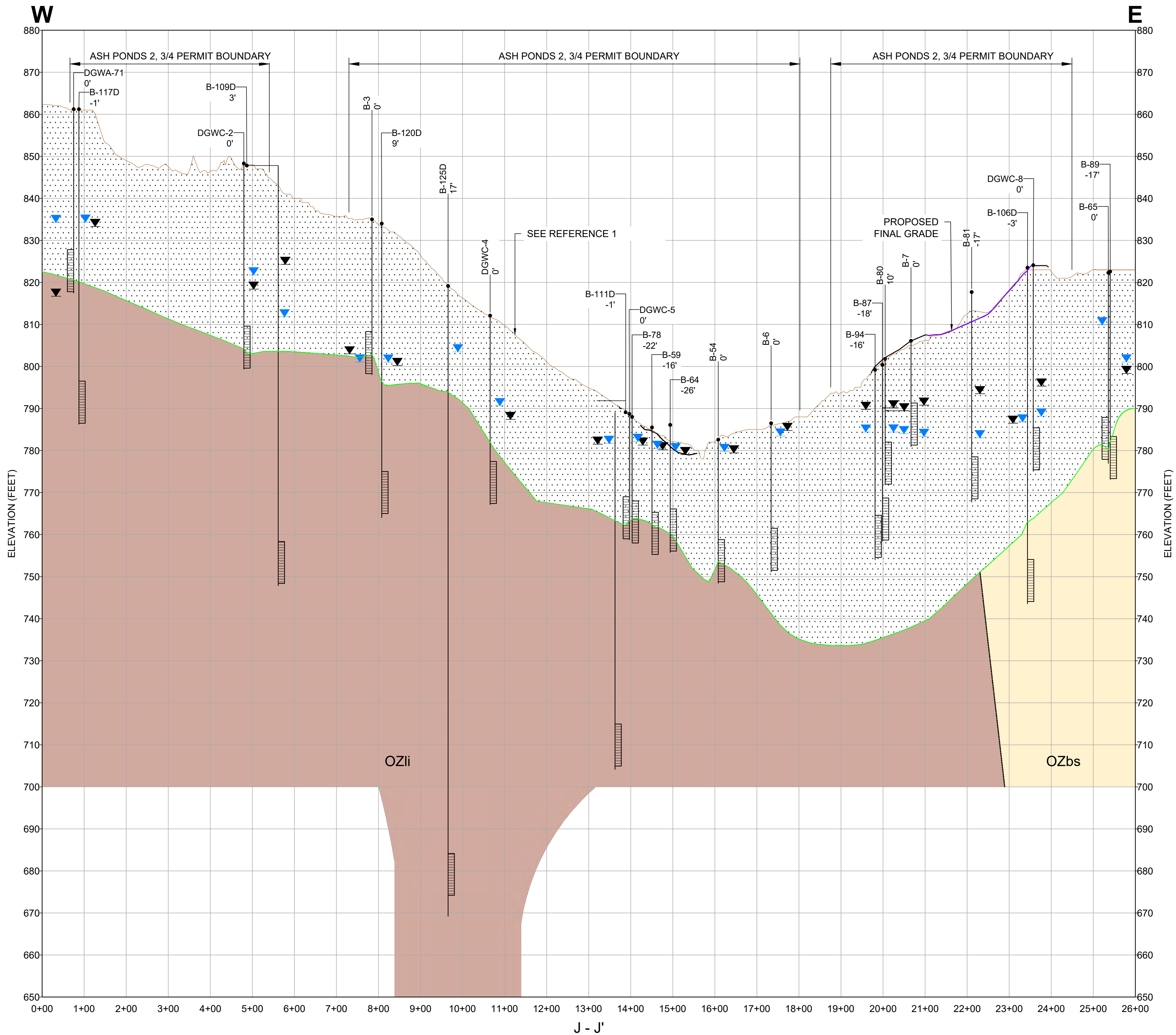
PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
GEOLOGIC CROSS-SECTION SCHEMATIC I-I'  
SHEET 9

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	

PROJECT NO. 1777449  
REV. 5  
SHEET GW-3i





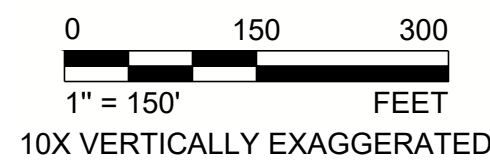
## REFERENCES

1. THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. GEORGIA STATE PLANE WEST SURVEY FEET.

2. BORING/WELL/PIEZOMETER LOCATIONS AND ELEVATIONS PROVIDED BY SOUTHERN COMPANY SERVICES, INC. AND 1988 LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT.

3. GEOLOGIC UNITS TAKEN FROM PETROLOGIC SOLUTIONS GEOLOGIC MAPPING, OCTOBER 2016.

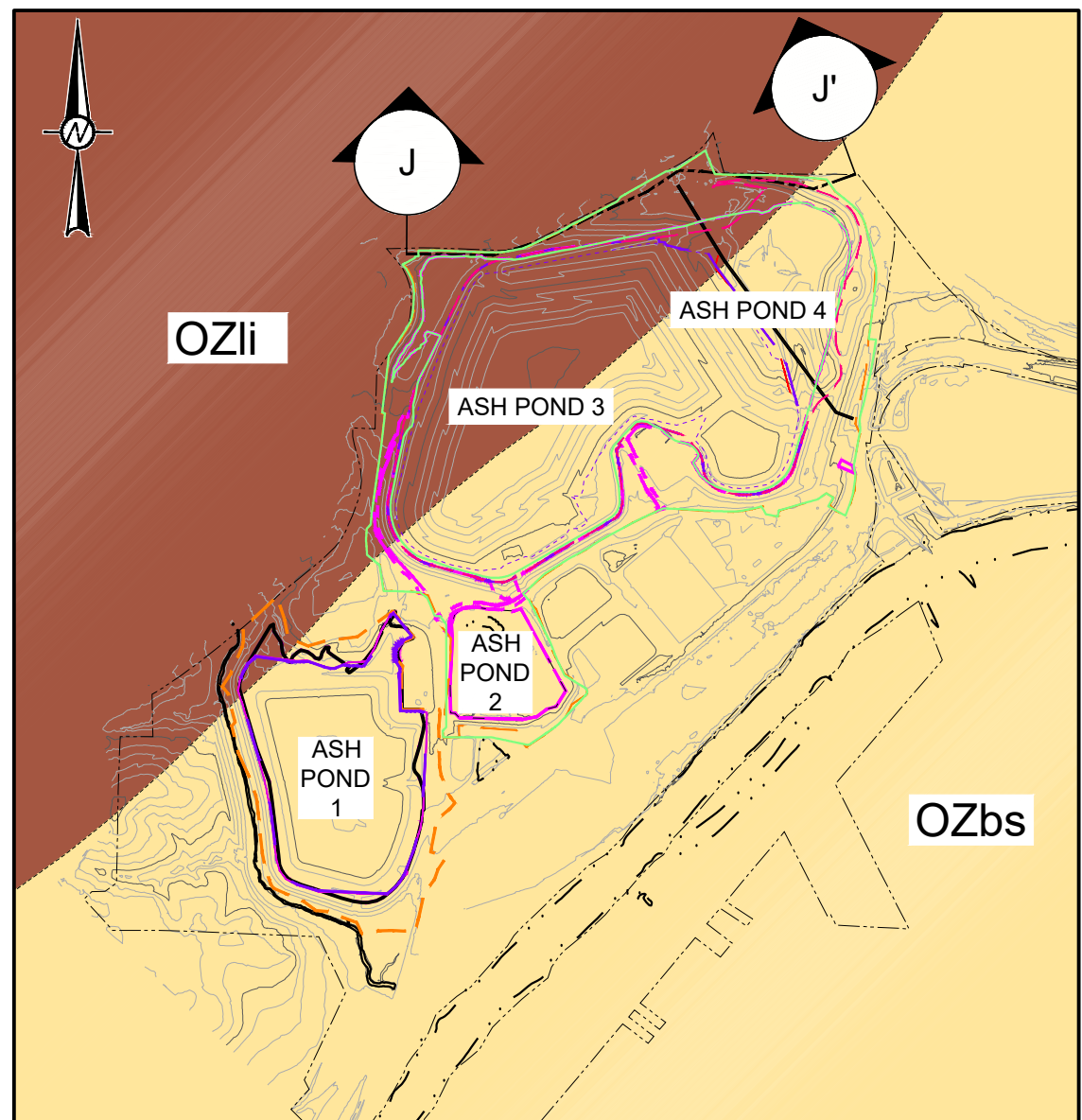
4. SELECT BORING/PIEZOMETER LOCATIONS AND ELEVATIONS SURVEYED AND/OR RESURVEYED BY METRO ENGINEERING & SURVEYING CO., INC., 2020 / 2021.



## NOTE

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION



## LEGEND

- EXISTING GRADE (SEE REFERENCE 1)
- ESTIMATED TOP OF ROCK SURFACE
- PROPOSED FINAL GRADE
- ESTIMATED PRE-CLOSURE BOTTOM OF CCR LIMITS
- FINAL COVER SYSTEM
- OVERBURDEN (COMPRISED OF RESIDUAL SOILS, TRANSITIONALLY WEATHERED ROCK, AND FILL)
- PHYLLONITE, BUTTON SCHIST, MYLONITE, AND MYLONITIC BIOTITE GNEISS (OZbs)
- BIOTITE GNEISS, LONG ISLAND CREEK GNEISS (OZli)
- ESTIMATED GROUNDWATER SURFACE (1/31/2023), B-125D 03/2023)
- PREDICTED POST-CLOSURE GROUNDWATER SURFACE
- BORING ID
- DISTANCE FROM CROSS-SECTION (FEET) (- REPRESENTS LEFT OF ALIGNMENT)
- GROUND SURFACE ELEVATION
- SCREEN INTERNAL

△	2023/12/06	UPDATE WATER LEVELS, & TOP OF ROCK TO INCLUDE BORINGS SINCE 2021	DLP	CRP	RNQ	RNQ
△	2023/05/12	UPDATED TOPO & WATER LEVEL TO 09/2022 & 03/2023, ADDITIONAL	DLP	CRP	RNQ	GLH
△	2022/07/14	NOTE ADDED FOR AP-1 DATA	DLP	CRP	RPK	GLH
△	2022/02/15	WATER LEVELS UPDATE 10/2021	DLP	RMS	RKP	GHL
△	2021/09/01	ADDED 2021 PIEZOMETERS / UPDATED CONTOURS	CG	AVR	DLP	RPK/GLH
△	2020/10/20	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	DLP	CCP	BAS	TIR / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
GEOLOGIC CROSS-SECTION SCHEMATIC J-J'  
SHEET 10

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	

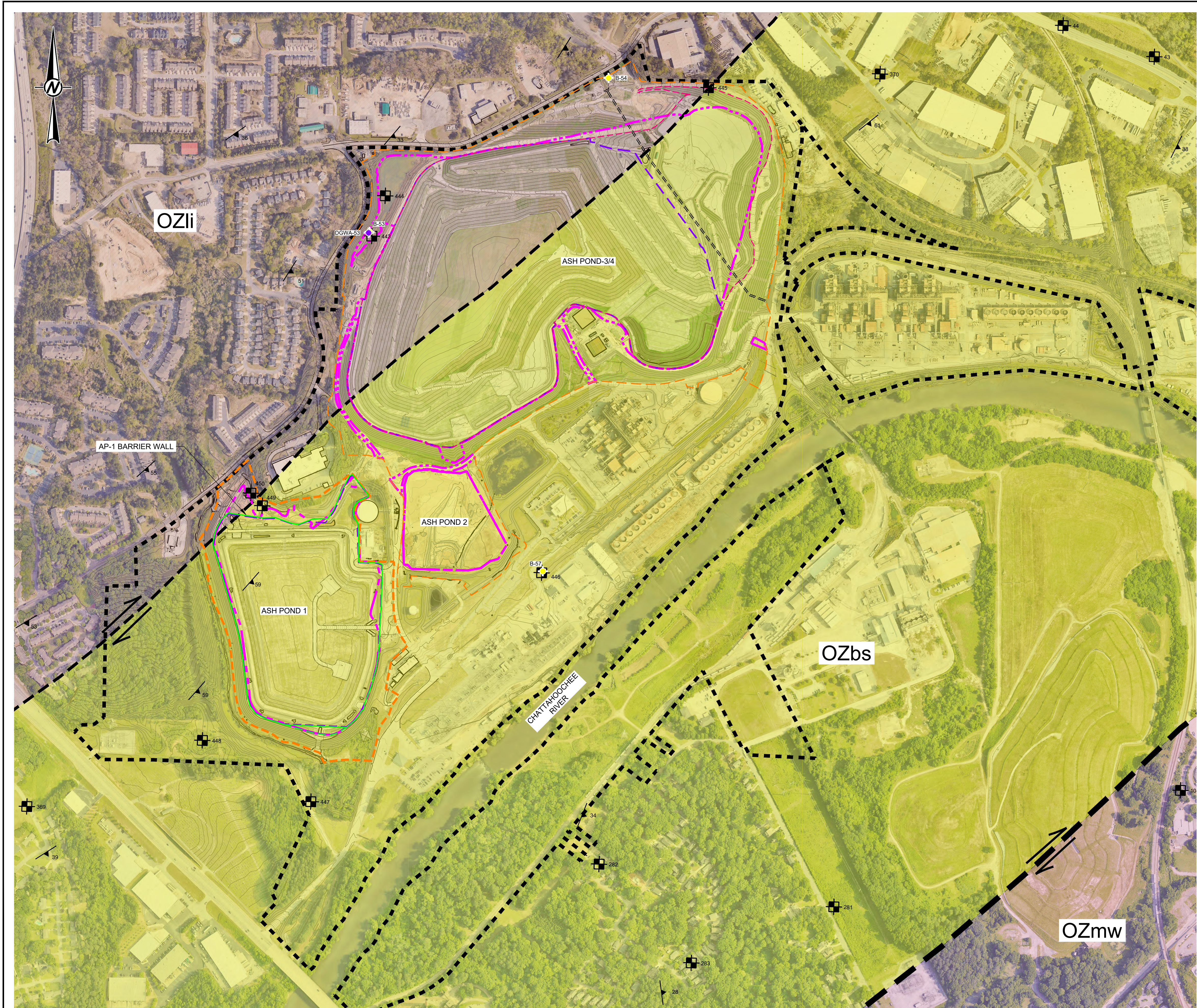
PROJECT NO.  
1777449

REV.  
5

SHEET  
GW-31

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D





**LEGEND**

EXISTING CONTOURS (SEE REFERENCE 2)

PROPERTY BOUNDARY (SEE REFERENCE 1)

APPROXIMATE PRE-CLOSURE CCR LIMITS

FINAL CLOSURE CCR LIMITS

PERMIT BOUNDARY

FUTURE BARRIER WALL OPTION A

FUTURE BARRIER WALL OPTION B

**GEOLOGIC LEGEND**

OZli - BIOTITE GNEISS (LONG ISLAND)

OZbs - PHYLLOHITE, BUTTON SCHIST, MYLONITE, AND MYLONITE BIOTITE GNEISS

OZmw - BREVARD ZONE MYLONITE - WHITE

INTERPRETED GEOLOGIC CONTACT

FAULT (STRIKE / SLIP) - APPROXIMATE LOCATION

STRIKE AND DIP OF FOLIATION

GEOLOGIC MAP STATION

UPGRADIENT WELL

PIEZOMETERS

**NOTE**

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

**REFERENCES**

1. APPROXIMATE PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY SERVICES (2017).

2. THE EXISTING TOPOGRAPHY, AND CONTOUR ELEVATIONS FOR THE ASH PONDS 1 THROUGH 4 AREAS WERE PROVIDED BY GEORGIA POWER. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, ON THE AP-1 IS AUGUST 31, 2022, ON AP-2, 3/4 IS NOVEMBER 2, 2022. AERIAL IMAGERY DATE FOR AP-3/4 PROVIDED BY GEORGIA POWER IS MAY 24, 2023, AND FOR AP-1, AP-2 AND SURROUNDING AREAS OF AP- 3/4, SOURCED BY PLEXEARTH, IS SEPTEMBER 28, 2023. THE TOPOGRAPHIC CONTOUR INTERVALS IS 1 FOOT.

THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS FOR THE SURROUNDING AREAS OF ASH PONDS 1 THROUGH 4 WERE PROVIDED BY GEORGIA LAND DEPARTMENT AND METRO ENGINEERING AND SURVEYING CO. INC. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS, AT THE SURROUNDING AREAS, IS 03-18-2018. REFER TO THE SURVEY DRAWING TITLED "TOPOGRAPHIC MAP PREPARED FOR GEORGIA POWER COMPANY PLANT MCDONOUGH - GEORGIA STATE PLANE WEST SURVEY FEET.

3. GEOLOGIC MAPPING PERFORMED BY PETROLLOGIC SOLUTIONS, OCTOBER 2016.

**FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION**

1" = 300'

FEET

	2023/12/06	UPDATE AERIAL IMAGE MAY-SEP 2023	DLP	CRP	RNQ	RNQ
	2023/05/12	UPDATED TOPO & AERIAL	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2021/09/01	UPDATED FINAL CLOSURE CCR LIMITS, CONTOURS	BAS	CRP	RPK	GLH
	2020/10/20	PROJECT TITLE CHANGE	DLP	CCP	BAS	TIR / GLH
	2020/03/06	GEOLOGIC MAP CHANGED FROM GW-2 TO NOW GW-4	VPM	VPM	JRJ	TIR / GLH
	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	R/W

CLIENT

GEORGIA POWER COMPANY  
PLANT MCDONOUGH

PROJECT

HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE

GEOLOGIC MAP

CONSULTANT

YYYY-MM-DD

2023-12-06

DESIGNED

DLP

PREPARED

CRP

CHECKED

DAH

REVIEWED / APPROVED

GLH

PROJECT NO.

1777449

REV.

6

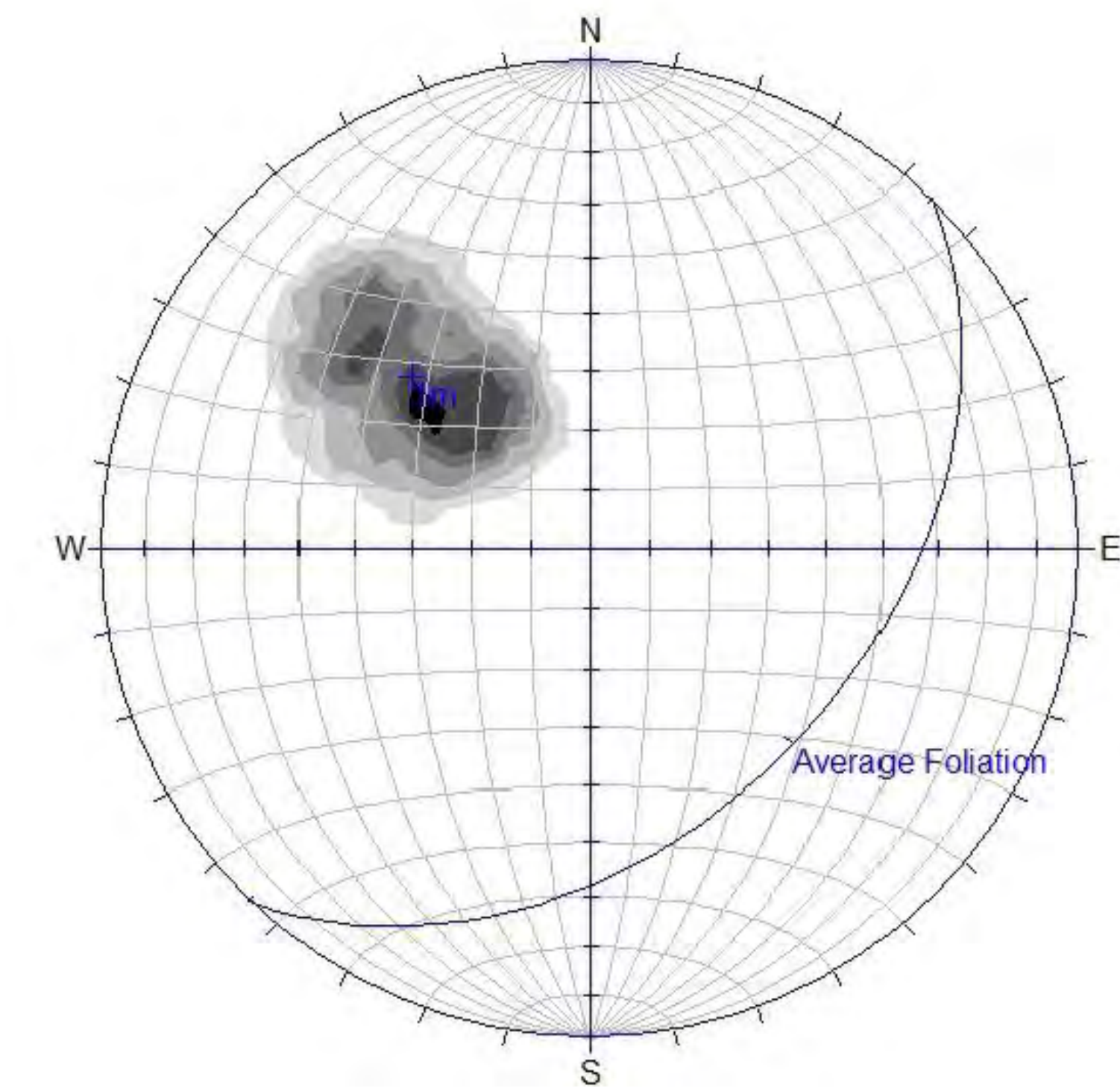
SHEET

GW-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D

1 in

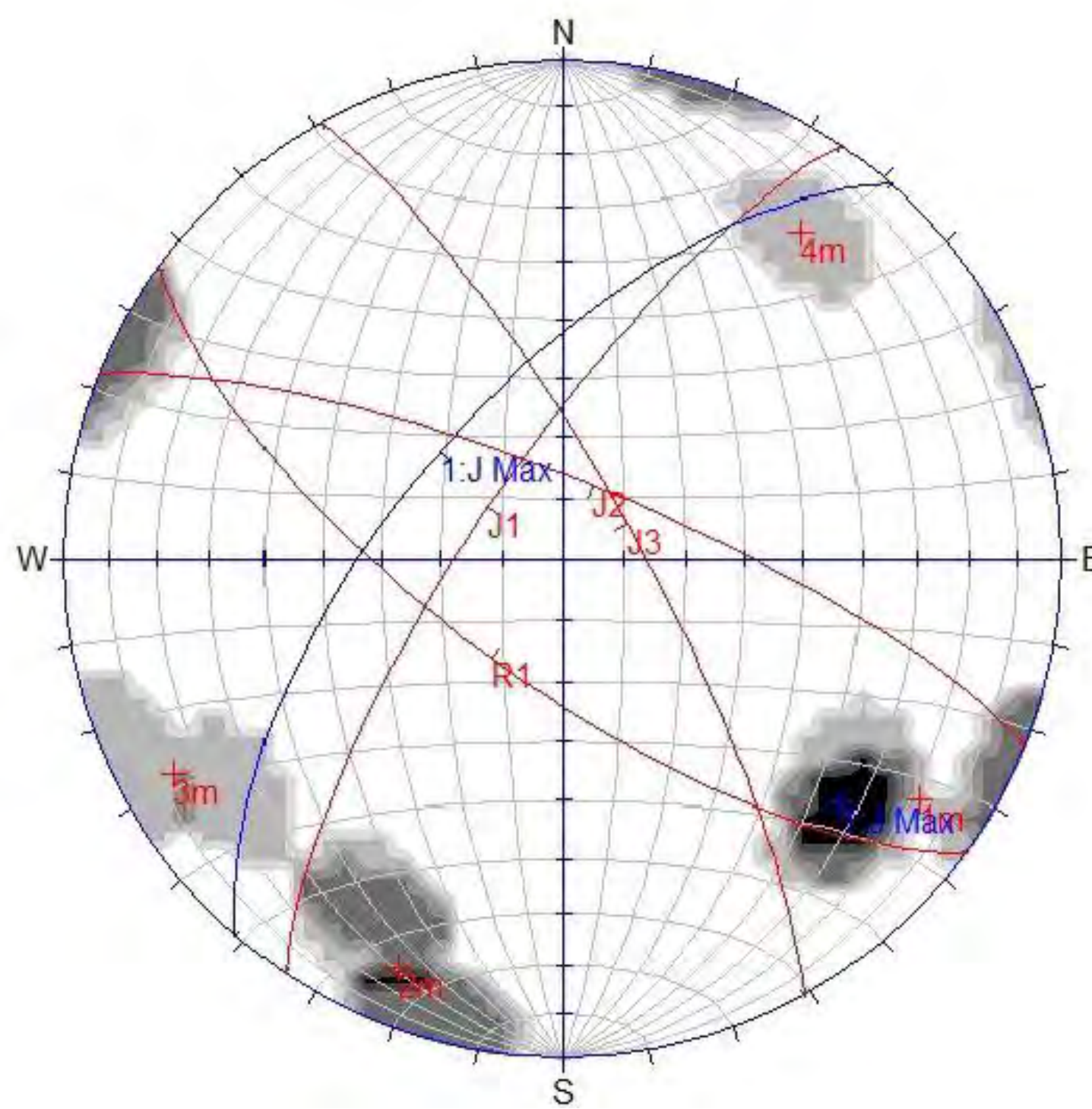




PLANT McDONOUGH - FOLIATION

ORIENTATIONS	
ID	STRIKE / DIP RIGHT
1 M	044 / 42

EQUAL AREA  
LOWER HEMISPHERE  
40 POLES  
40 ENTRIES



PLANT McDONOUGH - JOINTS

ORIENTATIONS	
ID	STRIKE / DIP RIGHT
1	221 / 63
1 M	214 / 75
2 M	292 / 77
3 M	331 / 78
4 M	126 / 70

EQUAL AREA  
LOWER HEMISPHERE  
12 POLES  
12 ENTRIES

NOTE

1. DATA PRESENTED FOR CCR UNIT AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

REFERENCES

1. DISCONTINUITY DATA COLLECTED AND ANALYZED BY PETROLOGIC SOLUTIONS, OCTOBER 2016.

△	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RNQ	GLH
△	2020/10/20	PROJECT TITLE CHANGE	DLP	CCP	BAS	TIR / GLH
△	2020/03/06	DISCONTINUITY DATA FROM GEOLOGIC MAPPING CHANGED FROM GW-3 TO GW-5	VPM	VPM	JRJ	TIR / GLH
△	2018/05/04	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

CLIENT  
GEORGIA POWER COMPANY  
PLANT MCDONOUGH



PROJECT  
HYDROGEOLOGIC ASSESSMENT REPORT (HAR)  
PLANT MCDONOUGH-ATKINSON  
ASH POND 1

TITLE  
DISCONTINUITY DATA FROM GEOLOGIC MAPPING

CONSULTANT	YYYY-MM-DD	2023-12-06
DESIGNED	DLP	
PREPARED	CRP	
CHECKED	DAH	
REVIEWED / APPROVED	GLH	

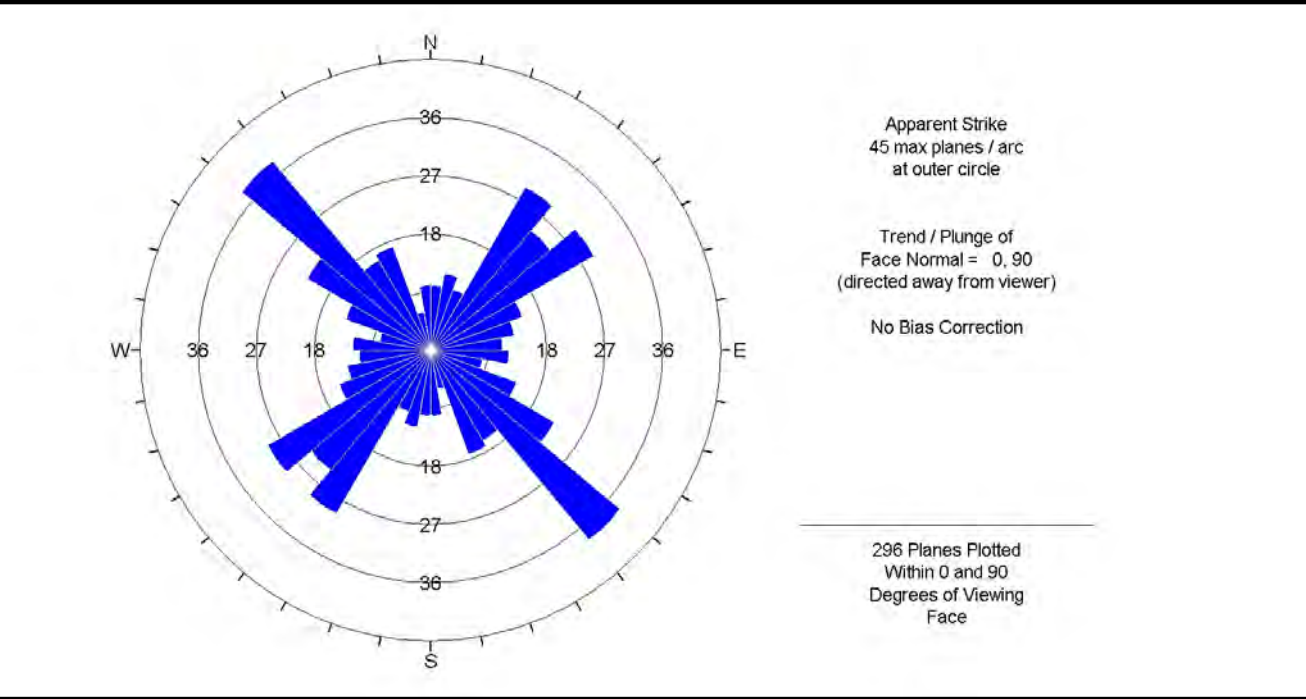
PROJECT NO.  
1777449

REV.  
3

SHEET  
GW-5

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION





Rose diagram of lineaments showing dominant orientations are parallel and perpendicular to geologic strike

**LEGEND**

- PROPERTY BOUNDARY (SEE REFERENCE 1)
- LINEAMENTS
- PERMIT BOUNDARY
- APPROXIMATE PRE-CLOSURE CCR LIMITS

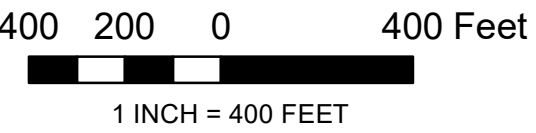
**NOTES**

- REMOTE SENSING / LINEAMENT ANALYSIS WAS COMPLETED BY EXPERIENCED GOLDER PERSONNEL USING SHADED RELIEF MAPS GENERATED FROM DIGITAL ELEVATION DATA, AERIAL PHOTOGRAPHS, AND USGS TOPOGRAPHIC MAPS FROM 1954 AND 1997.
- DATA PRESENTED FOR CCR UNITS AP-2 AND AP-3/4 IS INCLUDED FOR REFERENCE ONLY. THIS DATA SHOULD NOT BE CONSIDERED FOR PERMITTING OF CCR UNIT AP-1.

**REFERENCE**

- APPROXIMATE PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY SERVICES (2017)
- AERIAL IMAGE DATED NOVEMBER 2019 FROM GOOGLE EARTH AND AUGUST 31, 2022 FROM COOPER, BARNETTE & PAGE, INC. (CBP).
- DIGITAL TOPOGRAPHIC MAP OF THE 1954 NORTHWEST ATLANTA QUADRANGLE (1:24,000). PROJECTION: NAD 83 STATE PLANE FOR GEORGIA WEST IN FEET

FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION



△	2023/3/15	UPDATED LEGEND & AERIAL	DLP	YCS	LS	GLH
△	2020/10/20	UPDATED LEGEND & AERIAL	LS	VN	JDG	TIR / GLH
△	2018/05/04		SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW

CLIENT

GEORGIA POWER COMPANY  
PLANT MCDONOUGH

HYDROGEOLOGIC ASSESSMENT REPORT (HAR) PLANT  
MCDONOUGH-ATKINSON  
ASH POND 1

TITLE

REMOTE SENSING LINEAMENT MAP / COMPARISON OF  
MEASURED DISCONTINUITIES AND LINEAMENTS

CONSULTANT

YYYY/MM/DD

2018/10/16

DESIGNED

BBW

PREPARED

JDG

CHECKED

KNJ

REVIEWED / APPROVED

TIR/GLH

PROJECT NO.

1777449

REV.

2

SHEET

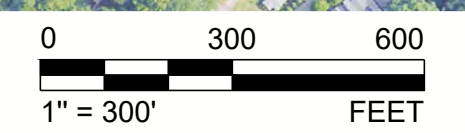
GW-6

IF THE MEASUREMENTS WERE TO VARY FROM THE DESIGN, THE USER SHALL BE RESPONSIBLE FOR THE RESULTS.





FOR PERMITTING PURPOSES  
NOT FOR CONSTRUCTION











ASH POND 2, 3/4 GROUNDWATER WELLS	
BORING ID	GROUNDWATER ELEVATION (Feet NAVD88)
DGWA-53	833.17
DGWA-70A	766.50
DGWA-71	834.26
DGWC-2	821.79
DGWC-4	790.66
DGWC-5	782.20
DGWC-8	788.20
DGWC-9	798.86
DGWC-10	796.78
DGWC-11	791.01
DGWC-12	766.45
DGWC-13	759.88
DGWC-14	772.78
DGWC-15	783.36
DGWC-17	800.02
DGWC-19	798.83
DGWC-20	798.78
DGWC-21	797.98
DGWC-22	795.31
DGWC-23	800.18
DGWC-42	774.88
DGWC-47	781.70
DGWC-48	774.25

Note: NAVD88 = North American Vertical Datum 1988

PIEZOMETERS		
	BORING ID	GROUNDWATER ELEVATION (Feet NAVD88)
	B-3	801.05
	B-6	783.45
	B-7	783.38
	B-16	789.93
	B-18	803.29
	B-24	802.02
	B-25	823.35
	B-26	826.78
	B-27	Abandoned
	B-28	786.24
	B-29	789.01
	B-31	764.06 Abnd
	B-41	770.80
	B-50	787.20
	B-51	753.60
	B-52	793.47
	B-54	779.77
	B-55	801.63
	B-56	796.24
	B-57	770.22
	B-58	768.81
	B-59	780.51
	B-60	751.28
	B-61	765.41
	B-62	745.57
	B-63	748.67
	B-64	779.97
	B-65	809.90
	B-66	799.50
	B-68	755.68
	B-72	755.63
	B-73	756.06
	B-74	755.71 Abnd
	B-76	746.19
	B-78	780.56
	B-79	781.92
	B-80	784.07
	B-77	748.44
Note: NAVD88 = North American Vertical Datum 1988		

PIEZOMETERS	
BORING ID	GROUNDWATER ELEVATION (Feet NAVD88)
B-81	783.05
B-82	799.75
B-83	747.04
B-84	Abandoned
B-85	779.78
B-86	782.57
B-87	784.43
B-88	782.56
B-89	801.06
B-90	782.30
B-91	779.40
B-92	780.11
B-93	782.19
B-94	784.40
B-95	782.15
B-96	779.61
B-97	781.48
B-98	783.16
B-99	779.37
B-100	745.05
B-101D	794.78
B-102D	791.92
B-103D	783.57
B-104D	781.88
B-105D	762.42
B-106D	786.82
B-107D	799.95
B-108D	798.70
B-109D	811.83
B-110D	756.49
B-111D	781.72
B-112D	758.89
B-113D	757.20
B-115D	768.34
B-116D	765.43
B-117D	834.35
B-118	756.73
B-119D	760.26
B-120D	801.14
B-122D	747.93
B-123D	768.02
B-125D	803.45 *
Note: NAVD88 = North American Vertical Datum 1988	


PIEZOMETERS	
BORING ID	GROUNDWATER ELEVATION (Feet NAVD88)
B-81	783.05
B-82	799.75
B-83	747.04
B-84	Abandoned
B-85	779.78
B-86	782.57
B-87	784.43
B-88	782.56
B-89	801.06
B-90	782.30
B-91	779.40
B-92	780.11
B-93	782.19
B-94	784.40
B-95	782.15
B-96	779.61

	2023/12/06	AERIAL IMAGE MAY-SEP 2023; WATER LEVELS 1/31/2023: B-31, B-74 & B-84 ABAND.	DLP	CRP	RNQ	RNQ
	2023/05/12	UPDATED TOPO, WATER LEVEL 09/2022 & 03/2023, ADDITIONAL MONITORING WELLS	DLP	CRP	RNQ	GLH
	2022/07/14	NOTE ADDED FOR AP1 DATA	DLP	CRP	RPK	GLH
	2022/01/07	UPDATED FOR OCTOBER 2021	SB	CRP	RPK	
	2021/09/01	UPDATED FOR FEBRUARY 2021	DLP	CRP	RPK/GLH	
	2020/10/20	UPDATED FOR AUGUST 2020	DLP	VPM	BAS	TIR / GLH
	2020/03/06	UPDATED FOR AUGUST 2019	VPM	VPM	JRJ	TIR / GLH
	2022/01/10	FOR PERMITTING PURPOSES NOT FOR CONSTRUCTION	SEP	DJC	KNJ	RPK / GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWR

CLIENT  
**GEORGIA POWER COMPANY**  
 PLANT MCDONOUGH

 Georgia Power

PROJECT HYDROGEOLOGIC ASSESSMENT REPORT (HAR) PLANT MCDONOUGH-ATKINSON ASH POND 1
TITLE <b>POTENTIOMETRIC SURFACE MAP - JANUARY 31 2023</b>

CONSULTANT	YYYY-MM-DD	2023-12-06
	DESIGNED	DLP
	PREPARED	CRP
	CHECKED	DAH
	REVIEWED / APPROVED	GLH

PROJECT NO. <b>1777449</b>	REV. <b>7</b>	SHEET <b>GW-7</b>
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1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D



APPENDIX A

# Perimeter Barrier Wall Design Support – Drilling and Testing Summary Report





## TECHNICAL MEMORANDUM

**DATE** December 13, 2023 **Project No.** 31406440.006

**TO** Ms. Alex Wild, PE; Ms. Lauren Petty, PG – Georgia Power Company

**CC** Mr. Stephen Benda – GPC; Mr. Brian Goldsmith, Mr. Nortey Yeboah, Mr. Damon Woodson – SCS

**FROM** Gregory L. Hebeler, PE; David Hannam, PG **EMAIL** gregory.hebeler@wsp.com

### PLANT MCDONOUGH AP-1 PERIMETER BARRIER WALL DESIGN SUPPLEMENTAL SUBSURFACE INVESTIGATION SUMMARY MEMO

## Executive Summary

This memo serves to summarize findings from a geotechnical and hydrogeological study performed in spring 2023 under the direction of WSP USA Inc. (WSP) (formerly Golder Associates Inc.) to assist Georgia Power Company (Georgia Power) in the collection of supplemental field data to support the perimeter barrier wall design at Plant McDonough (Site) Ash Pond 1 (AP-1).

Numerous subsurface investigation efforts and reports have been completed at Plant McDonough to inform the understanding of subsurface conditions at AP-1. These geotechnical, geologic, and geophysical subsurface investigations generated data that provided the basis for characterizing ground conditions for the AP-1 perimeter barrier wall design. A recent (2023) drilling, testing, and sampling program was designed based on a review of the site conditions with the objective of providing additional data in selected areas along the proposed barrier wall alignment. WSP, who serve as engineering and permitting consultants for AP-1 were hired by Georgia Power to complete a scope of services aimed at generating additional data on the following conditions under the approximate footprint of the proposed barrier wall:

- Subsurface stratigraphy and hydrogeologic conditions surrounding AP-1.
  - Depth to bedrock and thickness of partially weathered rock (PWR)
  - Quantitative bedrock data, including fracture frequency, rock hardness, and hydraulic property characteristics of bedrock strata.

WSP contracted Premier Drilling LLC (Premier) and completed a five-hole supplemental drilling program including soil logging, rock core logging, geotechnical testing, hydrogeological testing, and geophysical logging in Spring 2023. The major findings of this field investigation are summarized below.

- The geologic units encountered in the program are consistent with the pre- 2023 investigation understanding from the conceptual site model and overall geologic and hydrogeologic understanding of the AP-1 site conditions based on previous investigations. See the site Hydrogeologic Assessment Report (WSP 2023) for relevant site summary conditions.
- The 2023 dataset serves to expand the 2017 Advanced Engineering Investigation dataset used in the original design of the perimeter barrier wall.



- Some variability between previously estimated top of PWR and top of rock was observed across the new investigation locations, reinforcing the previously understood trend that PWR and rock conditions and elevations can vary tens of feet locally across small distances onsite.
- Drillhole geotechnical logging data confirmed previous onsite data that fracture frequency and weathering generally decrease and core recovery increases below 30 ft from the top of rock.
- Geotechnical rock strength laboratory results were variable and indicate that the strength and hardness of the rock mass depend heavily on the degree of rock weathering at a given depth and location, but that UCS strengths up to nominally 20,000 psi were encountered in the tested samples.
- The 2023 investigations extended deeper into bedrock than most previous investigations and further reinforce that bedrock conditions can be grouped into two separate near surface characteristic zones. An upper highly fractured, weathered bedrock zone, approximately 30 ft thick, and with a hydraulic conductivity approximately an order of magnitude greater than the lower less fractured and less weathered bedrock zone.
- The previous hydraulic conductivity value used to represent the entire bedrock formation in groundwater modeling efforts was found to be a reasonable average of the upper and lower bedrock zones. The previous overall average bedrock k value is about a half order of magnitude higher than the hydraulic conductivity estimated for the lower bedrock zone and a half order of magnitude lower than the hydraulic conductivity estimated for the upper bedrock zone.



## 1.0 INTRODUCTION

WSP USA Inc. (WSP) (formerly Golder Associates Inc.) performed a geotechnical and hydrogeological study in spring 2023 to assist Georgia Power Company (Georgia Power) in the collection of supplemental field data to support the perimeter barrier wall design at Plant McDonough (Site) Ash Pond 1 (AP-1). The scope of services included soil drilling, rock coring, packer testing and downhole geophysics with the goal of generating additional data on the following under the approximate footprint of the proposed barrier wall.

- Depth to bedrock and partially weathered rock (PWR)
- Thickness of PWR
- Quantitative data on the fracture frequency, hardness, and flow characteristics of bedrock strata below the PWR

Drawing Sheet 1 of Appendix A shows a plan view summary of AP-1 and the historical subsurface investigations completed in and around the ash pond along with the locations of the borings drilled in 2023.

### 1.1 Site Description and Physiography

Plant McDonough is in southeast Cobb County, GA and is owned and operated by Georgia Power. The property occupies approximately 390 acres and is bounded on the southeast by the Chattahoochee River. The Site is located within the Piedmont Physiographic Province of central GA, characterized by gently rolling hills and narrow valleys with locally pronounced linear ridges. Overall, the property slopes gently south towards the Chattahoochee River. Topographic relief near Plant McDonough ranges from less than 750 feet North American Vertical Datum 1988 (ft NAVD88) near the tributaries and river to greater than 840 ft NAVD88 near the center of the property.

AP-1 is in the western limits of the Site on ground topographically sloped downward to the southwest, creating an impoundment via side-hill embankments constructed along the western and southern portions of the unit that tie into higher natural ground in the northeast quadrant of the unit.

An unnamed creek originally flowed south through the footprint of the current AP-1 area. The creek was rerouted into an engineered stream channel that now flows parallel and adjacent to the western and southern boundary of AP-1.

### 1.2 Current Site Conditions and Pond Closure

AP-1 is an inactive surface impoundment at Plant McDonough currently undergoing closure per the plans presented in the Plant McDonough CCR Unit AP-1 Permit Application. The closure process includes placement of a permanent cover system designed to minimize infiltration and erosion and to meet or exceed the requirements of 257.102(d)(3)(ii); as of December 2023, closure construction is substantially complete.

## 2.0 GEOLOGIC AND HYDROGEOLOGIC SETTING

Multiple subsurface investigations and reports have been completed at AP-1. These investigations have generated data that provided the basis for characterizing ground conditions for the perimeter barrier wall design. Regional and site-specific geology and hydrogeology are discussed in detail in the main body of the Hydrogeologic Assessment Report (HAR) for AP-1 (WSP USA, 2023).



This report summarizes information pertinent to the scope, providing additional data for the AP-1 barrier wall design. For more detailed information on the geologic setting at Plant McDonough please see the HAR.

## 2.1 Residual Soil and Saprolite

Boring logs indicate that residual and saprolite soils, primarily clayey/sandy silt, sandy silt with clay, and silty sand (increasing with depth), occur as a variably thick deposit overlying partially weathered rock (PWR) and bedrock across most of the Site. These soils range in thickness from approximately 4 to 55 feet across the Site and were generally encountered at or near ground surface. Underlying the residuum and saprolite, is PWR, which is defined by Standard Penetration Test (SPT) blow counts that exceed 100 blows/twelve inches. The residual soils and saprolite are collectively referred to as overburden in this report and the groundwater models for the Site. The thickness of the overburden encountered in the borings is variable, ranging from a minimum of approximately 10 feet to as much as approximately 80 feet. Thickness of PWR varied from 0 feet to approximately 20 feet.

## 2.2 Lithologic Units

Based on the detailed geologic mapping carried out previously onsite, the plant property is underlain by two lithological units separated by a faulted intrusive contact, which trends northeast to southwest through the Site.

The plant property northwest of the faulted contact is underlain by the following unit:

Long Island Creek Gneiss (OZli): a medium- to coarse- grained; very felsic rock that yields light-colored soil. Foliation is moderately well-developed; near faults and shear zones, the gneiss has an augen texture; locally intruded by granitic pegmatites that are commonly unsheared (Figure 2.1).



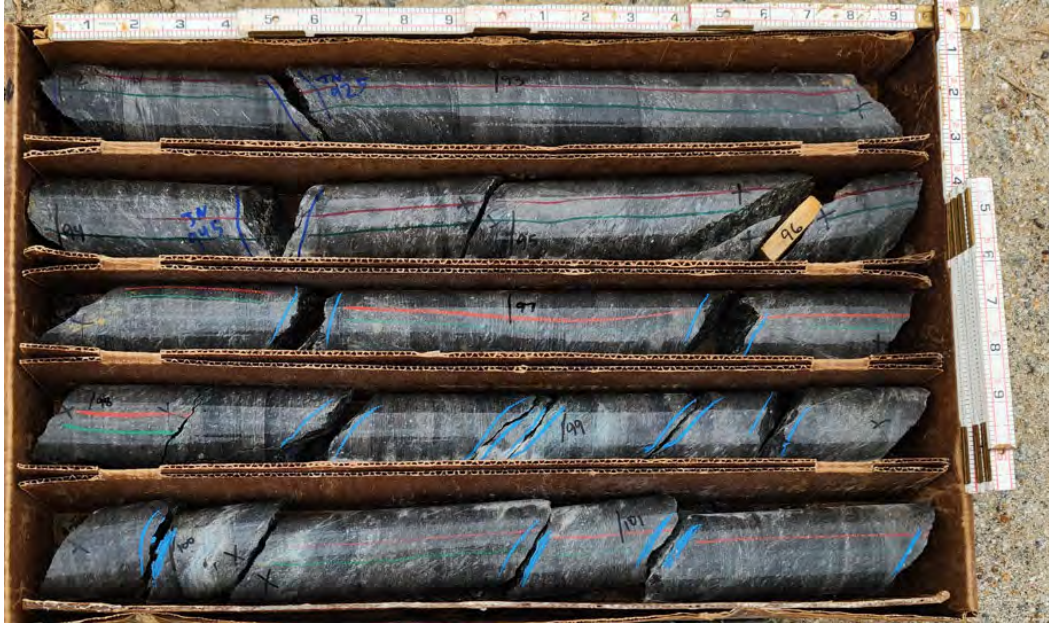
**Figure 2.1: Rock Core Photo showing the Long Island Creek Gneiss formation from BW-5, 25 to 30 feet below Existing Ground Level**

The plant property southeast of the faulted contact is underlain by the following unit:

Phyllonite, Button Schist, Mylonite, and Mylonitic Biotite Gneiss (Ozbs): rocks all interlayered on a scale of inches, feet, and tens of feet. The phyllonite consists of fine recrystallized muscovite along schistosity surfaces, formed by dislocation (shearing) metamorphism. The mylonite button schist is composed primarily of fine sericite, muscovite, quartz, and feldspar; with medium- to coarse-grained muscovite forming distinctive 'eyes;' there is a well-developed shear foliation. The mylonite is composed of sericite, quartz, and feldspar, extremely fine-grained, with



a poorly developed foliation. The mylonitic biotite gneiss is composed primarily of biotite, quartz, and feldspar, very fine-grained, with a well-developed shear foliation (Figure 2.2).



**Figure 2.2: Rock Core Photo showing the Button Schist formation from BW-3, 92 to 101 feet below Existing Ground Level**



### 3.0 2023 FIELD INVESTIGATION AND DATA COLLECTION

WSP provided geological, geotechnical, and hydrogeological consulting services to drill BW-1 to BW-5 at AP-1 at Georgia Power's Plant McDonough. The five drilling locations were spatially distributed along the alignment for the proposed location of a barrier wall for AP-1 and were field located by a WSP engineer or geologist. The project location and drillhole sites are shown on Drawing Sheet 1 of Appendix A.

The drilling was performed by Premier Drilling LLC (Premier). Premier used a Central Mining Equipment (CME) 550X truck-mounted drill rig for this project. Soil drilling was conducted using hollow stem augers (HSA) for BW-5 and mud rotary wash drilling with a tricone rock coring bit for the remaining four drillholes. Rock coring was conducted using double tube HQ size (63.5-mm nominal core diameter) wireline coring methods with a 10-ft double tube core barrel. All holes were drilled vertically and cored continuously from the bottom of the PVC casing to the full depth of the holes. Premier used standard diamond-impregnated drill bits.

Interval pressure testing using inflatable packers was performed in all five of the drillholes. Interval pressure testing was conducted in the PWR where possible (BW-1 and BW-5). After completion of the drilling program, WSP selected samples of rock for geotechnical testing. Geotechnical testing was completed at WSP's Atlanta material testing laboratory.

A summary of field investigation activities and associated data collection is presented below:

- Drilling of five vertical drillholes (between 71 feet [ft] and 131 ft in length) totaling 511 ft of total drilling.
- HSA were used to advance to top of rock in BW-5 where PVC casing was set to a depth of 25 ft. SPT samples were collected on 5 ft centers.
- Rotary wash drilling with a tricone rock bit was used to advance to top of rock to set PVC casing in the remaining 4 drillholes totaling 242.5 ft.
- Rotary core drilling methods were used for a total of 243.5 ft of rock coring with associated geological/geotechnical core logging using WSP's standard technical procedure.
- WSP collected 18 rock core samples for geotechnical core testing including unconfined compressive strength testing, point load tests, and moisture content tests.
- WSP completed geophysical logging of four of the drillholes using caliper, gamma-logging, heat pulse flow meter (only BW-4), fluid temperature, conductivity and single-point resistance (SPR).
- Hydrogeological (packer) testing was carried out in all five of the drillholes with a total of 17 tests. Fifteen (15) of the tests were in bedrock and two of the tests were in the PWR.
- Metro Engineering & Surveying Company, Inc. (Metro) completed a survey of the drillhole locations.

Drillhole logs along with soil and core photography are provided in Appendices B and C. Geotechnical laboratory results are included as Appendix D. A summary of the geophysical testing equipment, methodologies, and results along with the geophysical logs are provided in Appendix E. Hydrogeological testing methodology, equipment, and results are summarized in Appendix F.



### 3.1 Drillhole Locations

WSP completed a final collar survey of the completed drillhole locations. Details of the drillholes, including collar survey coordinates and elevations, are provided in Table 3.1. Drilling started March 6, 2023 and finished March 23, 2023. The locations of the drillholes are shown in Sheet 1 of Appendix A.

**Table 3.1: Summary of Drillhole Locations**

Drillhole Name	Drilling Start Date	Drilling End Date	Northing (ft)	Easting (ft)	Ground Surface Elevation (ft)	Inclination / Azimuth	Corehole Depth (ft bgs)	Corehole Bottom El. (ft)
BW-1	3/8/2023	3/13/2023	1,391,134.51	2,200,836.22	789.91	-90 / --	93	696.9
BW-2	3/9/2023	3/23/2023	1,390,483.21	2,201,056.50	789.82	-90 / --	110	679.8
BW-3	3/16/2023	3/22/2023	1,390,653.98	2,201,675.12	789.67	-90 / --	106	683.7
BW-4	3/17/2023	3/27/2023	1,391,306.59	2,201,755.32	797.05	-90 / --	131	666.1
BW-5	3/6/2023	3/7/2023	1,391,737.84	2,200,988.01	779.66	-90 / --	71	708.7

Notes:

1. Coordinates are provided in Georgia State Plane, West Zone, NAD83(2011)
2. Elevations are provided in North American Vertical Datum 1988.
3. ft - feet
4. bgs – below ground surface

### 3.2 Overburden Drilling and Rock Coring

Details of the drilling, including the encountered depth of PWR and total drillhole depth, are shown in Table 3.2. A total of 511 ft was drilled in the five drillholes with 243.5 ft of rock coring.

**Table 3.2: Drilling Summary**

Drillhole	Bottom of Soil Depth (ft bgs)	Bottom of PWR Depth (ft bgs)	Total Depth (ft bgs)	Soil Thickness (ft)	PWR Thickness (ft)	Coring Length (ft)
BW-1	39.5	45.0	93.0	39.5	5.5	48.0
BW-2	60.5	62.0	110.0	60.5	1.5	48.0
BW-3	58.0	-	106.0	58.0	-	48.0
BW-4	77.5	-	131.0	77.5	-	53.5
BW-5	10.5	25.0	71.0	10.5	14.5	46.0

Notes:

1. ft – feet
2. bgs – below ground surface
3. “-” unit not present in drillhole

For BW-4 where utilities were a concern, the top 10 ft below the ground surface was hydro-vacuumed and the location was approved by a Kinder Morgan representative on March 16, 2023. Following completion of all drilling,



logging, and testing; drillholes were abandoned using a cement-bentonite grout via tremie-grouting techniques. Bentonite pellets were used to top off grouted drillholes after grout settled.

### 3.2.1 Soil Logging

Soil sampling and logging was performed by a geologist in general accordance with Soil Sampling Procedures that incorporate the provisions of American Society for Testing and Materials (ASTM) D2488, Standard Practice for Classifications of Soils for Engineering Purposes (Unified Soil Classification System) as well as ASTM D1586-11, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrell Sampling of Soils.

SPT soil sampling was conducted using a 140- pound automatic hammer with a vertical drop of 30 inches to obtain a 2.0-foot (24-inch) long soil sample. Standard SPT sampling only collects an 18-in sample (three 6-inch intervals). For this project a 24-inch sample was collected for the additional sample volume availability. SPT samples were collected at 5.0-foot intervals from roughly ground surface to the top of rock. SPT blow counts were recorded for each six-inch interval, with the middle two intervals comprising the SPT N-value. No Shelby tube samples were collected. In addition, no soil samples were assigned geotechnical testing, at this time.

Soil samples were placed into glass jars at the drill site and labelled with drillhole name, drill date, sample depth, and SPT values. Additional samples volume was placed in sealed Ziploc bags. All soil samples were logged, photographed, and geotechnically sampled by WSP personnel. Split spoon samples were photographed with a photo board indicating the relevant soil information. A tape measure was included in each photo for scale and reference.

### 3.2.2 Rock Core Logging

Geological and geotechnical logging (in addition to defining and describing the lithological formations/units) was performed to provide a detailed description of the rock mass, including characteristics of structural discontinuities, to determine the rock quality. The rock mass classification systems, which can be assessed from the rock core descriptions, include the Rock Tunneling Quality Index (Q system), after Barton et al. (1974); and the Rock Mass Rating (RMR) system, after Bieniawski (1989).

Detailed geotechnical and discontinuity logging was performed on five holes for the total 243.5 ft of rock core. A summary of the units/formations encountered and their thicknesses in each drillhole can be found in Table 3.3.

The geotechnical core logging performed by a geologist with WSP included the following:

- Lithological and geological descriptions
- Core parameters: Total Core Recovery (TCR), Rock Quality Designation (RQD), fractures per ft, strength index, and weathering index
- Detailed description of structural discontinuities: Fracture type, dip with respect to core axis, shape, roughness, type, character, and thickness of coating/infilling
- Identification of zones of fault breccia/gouge, karst voids, and broken, or lost core (where noted by the driller)
- Core photography



**Table 3.3: Formation Summary by Drillhole**

Formations/Units	Drillhole ID				
	BW-1	BW-2	BW-3	BW-4	BW-5
	Depth (ft bgs)				
Top of PWR	39.5	60.5	-	-	10.5
Top of Long Island Creek Gneiss	-	-	-	-	25.0
Top of Button Schist	45.0	62.0	58.0	77.5	31.0
Base of Borehole	93.0	110.0	106.0	131.0	71.0
Formations/Units	Elevation (ft)				
Surface Elevation	789.9	789.8	789.7	797.1	779.7
Top of PWR	750.4	729.3	-	-	769.2
Top of Long Island Creek Gneiss	-	-	-	-	754.7
Top of Button Schist	744.9	727.8	731.7	719.6	748.7
Base of Borehole	696.9	679.8	683.7	666.1	708.7
Formations/Units	Thickness (ft)				
Soil	39.5	60.5	58.0	77.5	10.5
PWR	5.5	1.5	-	-	14.5
Long Island Creek Gneiss	-	-	-	-	6.0
Button Schist	48.0	48.0	48.0	53.5	40.0
Combined Bedrock	48.0	48.0	48.0	53.5	46.0

Notes:

1. ft - feet
2. ft bgs - feet below ground surface
3. "-" unit is not present in the drillhole.
4. Elevations are provided in North American Vertical Datum 1988
5. PWR – partially weathered rock

Rock core was placed into wax impregnated cardboard boxes at the drill site, with depth indicator blocks, or markings, placed at the end of each core interval. Each core box was labeled with the appropriate drillhole number and depth range. All rock core was logged, photographed, and geotechnically sampled by WSP personnel. Core was photographed with a photo board indicating the relevant core box information. A measuring tape and color scale were also included in each photo for scale and reference.

### 3.2.3 Geotechnical Sampling and Laboratory Testing of Rock Core Samples

WSP collected 18 rock core samples suitable for geotechnical laboratory testing. Geotechnical samples were brushed and washed clean to remove mud and drill cuttings before carefully packaging and delivery to the WSP laboratory in Norcross, GA. The testing included compressive strength and elastic moduli of rock (ASTM D7012 - Method C) and point load strength index of rock (ASTM 5731) A summary of the results of the geotechnical material properties testing is presented in Table 3.4. Geotechnical laboratory tests results are presented in Appendix D.



**Table 3.4: Geotechnical Laboratory Testing Results Summary**

Drillhole Name	Sample ID	Sample Depth (ft bgs)	Formation	Rock Type	Test Type	I <sub>s</sub> Point Load Strength Index (psi)	UCS (psi)	Unit Weight (pcf)
BW-1	BW-1-2	46.0	Button	Schist	A	792	19,398	-
BW-2	BW-2-3	69.5	Button	Schist	A	115	2,819	-
BW-2	BW-2-4	70.5	Button	Schist	D	109	2,677	-
BW-2	BW-2-6	77.3-78.0	Button	Schist	D	240	5,872	-
BW-3	BW-3-7	59.4	Button	Schist	D	18	451	-
BW-3	BW-3-7	59.4	Button	Schist	A	181	4,423	-
BW-3	BW-3-8	60.3	Button	Schist	A	98	2,410	-
BW-3	BW-3-9	66.7	Button	Schist	A	9	220	-
BW-3	BW-3-10	67.0	Button	Schist	D	18	447	-
BW-3	BW-3-11	68.9	Button	Schist	A	83	2,026	-
BW-4	BW-4-12	78.0	Button	Schist	D	47	1,145	-
BW-4	BW-4-12	78.0	Button	Schist	A	293	7,181	-
BW-4	BW-4-13	79.5	Button	Schist	D	153	3,748	-
BW-4	BW-4-13	79.5	Button	Schist	A	939	23,004	-
BW-4	BW-4-14	89.2	Button	Schist	D	51	1,237	-
BW-4	BW-4-14	89.2	Button	Schist	A	799	19,585	-
BW-4	BW-4-15	89.8-90.7	Button	Schist	N/A	6,015	-	174
BW-5	BW-5-16	25.3	LIC	Gneiss	A	298	7,300	-
BW-5	BW-5-17	25.7	LIC	Gneiss	D	119	2,917	-
BW-5	BW-5-17	25.7	LIC	Gneiss	A	427	10,467	-
BW-5	BW-5-18	27.2-28.0	LIC	Gneiss	N/A	12,787	-	162

Notes:

1. ft bgs - feet below ground surface
2. UCS – unconfined compressive strength. UCS are values based on correlation with point load test except for samples BW-4-15 and BW-5-18 where a direct UCS test was conducted.
3. psi – pounds per square inch
4. pcf – pounds per cubic foot
5. D = Diametral / A = Axial
6. I<sub>s</sub> Point Load Strength Index = Failure Load divided by the square of the equivalent dimension
7. N/A – not applicable
8. LIC – Long Island Creek



### 3.2.4 Geophysical Drillhole Logging

Following completion of geotechnical rock core logging, select drillholes (BW-1, BW-2, BW-3, and BW-4) were logged using caliper, gamma-logging, heat pulse flow meter (BW-4 only), fluid temperature, conductivity, and single-point resistance (SPR) geophysical logging. The logging was performed in the completed drillhole prior to drillhole abandonment. The geophysical logging allows WSP to assess rock condition in place. Figure 3.1 shows geophysical logging equipment being lowered down the drillhole. Figure 3.2 presents an extract of an example geophysical log. Geophysical logs are provided in a technical memorandum summarizing the geophysical drillhole logging equipment, procedure, and results which is provided in Appendix E.



Figure 3.1: Photo of Geophysical Testing at BW-2



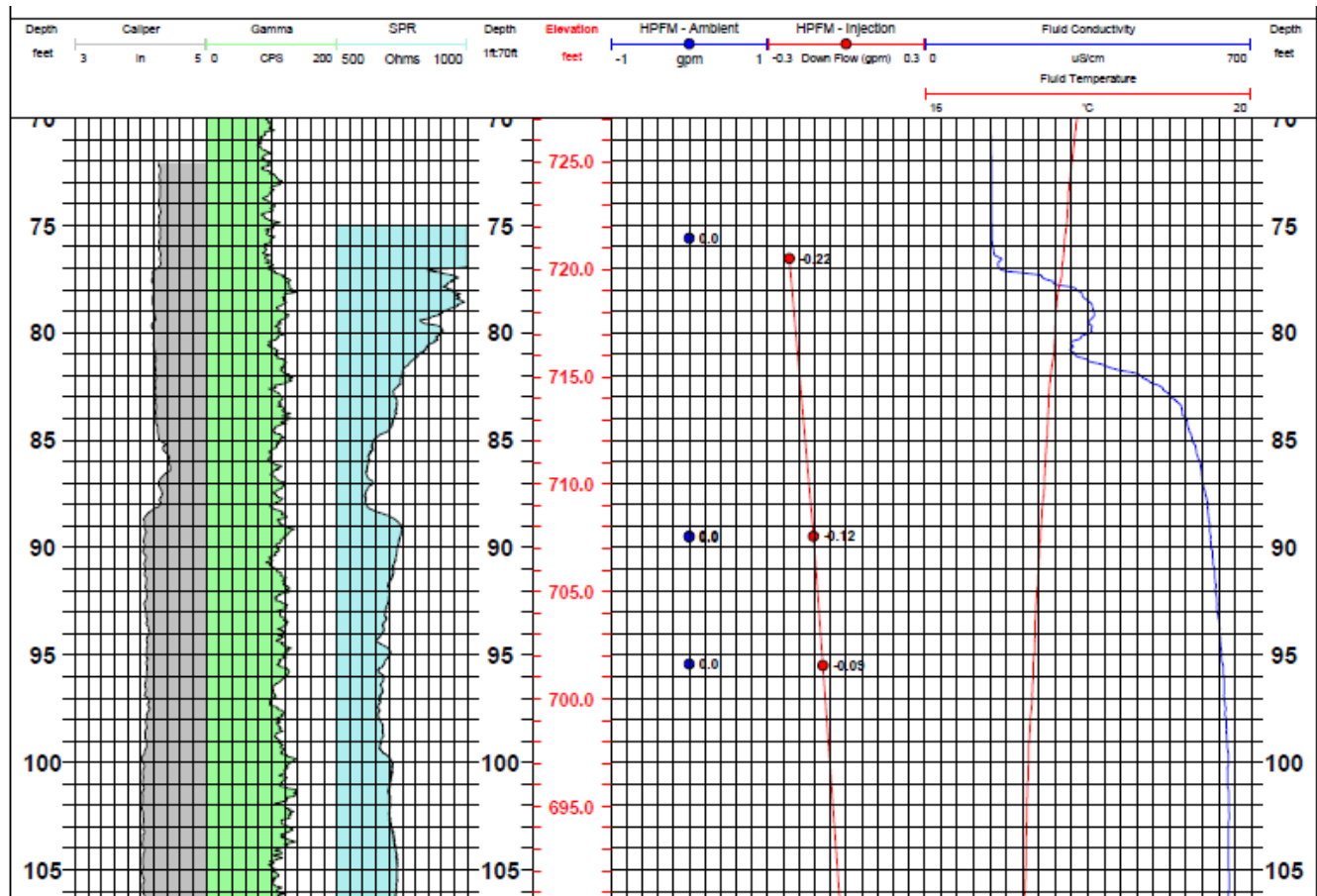


Figure 3.2: Extract of the Downhole Geophysical Log at BW-4

### 3.3 Hydrogeological Testing

Water pressure (packer) test data were collected and analyzed in all five of the drillholes for a total of 17 tests. Fifteen of the tests were in bedrock and two of the tests were in the PWR. The testing completed resulted in estimates of hydraulic conductivity (the horizontal component). On this site, most groundwater movement is expected to occur laterally (sub-horizontally). This is because of the direction of groundwater flow, and that the horizontal x- and y-direction (horizontal) permeabilities are higher than the z-direction (vertical) permeability. A Technical Memorandum was prepared summarizing the equipment, analyses, and results and is provided in Appendix F. Figures 3.3, and 3.4, show the hydrogeological testing setup at surface, a conventional single packer that was sent downhole, and an example wireline packer testing tool schematic.





Figure 3.3: Photo of Hydrogeological Testing Setup at Surface

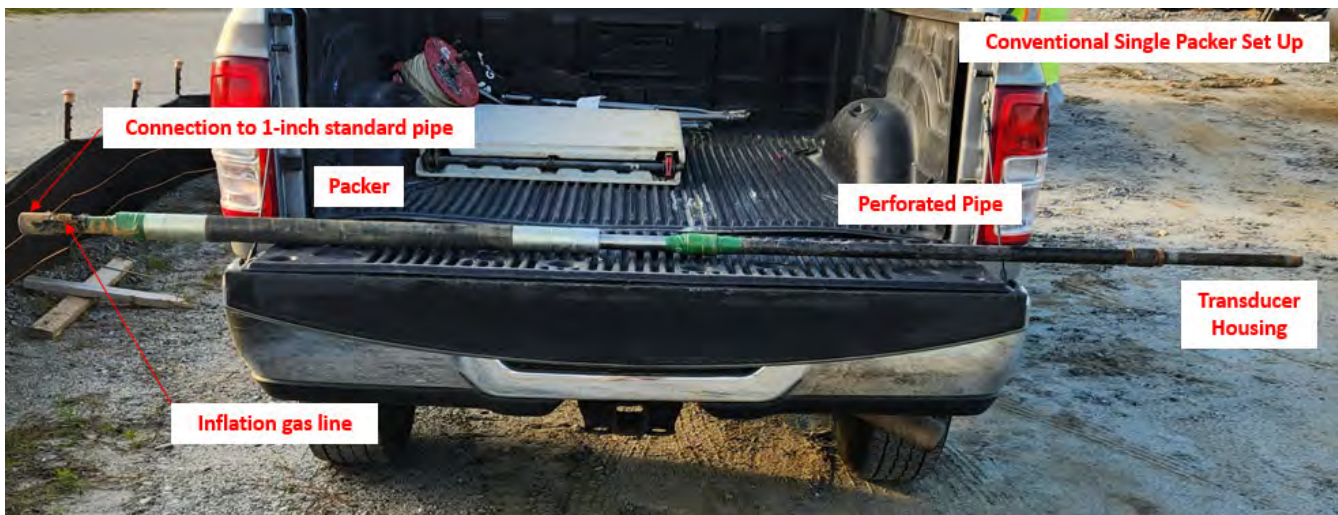


Figure 3.4: Photo of the Conventional Single Packer Setup

### 3.3.1 Hydrogeological Testing Summary

Seventeen hydrogeological (packer) tests were completed in five investigation drillholes (BW-1, BW-2, BW-3, BW-4, and BW-5) covering a cumulative drillhole length of 264 feet. Figure 3.6 presents an example Lugeon test curve for laminar flow and the interpreted hydraulic conductivity from the water pressure test record for BW-3's test from 62.7 to 106.0 ft bgs. The test results are summarized in Table 3.5. The estimated horizontal hydraulic conductivity values were primarily moderate ( $1 \times 10^{-4}$  to  $1 \times 10^{-5}$  cm/s), with several in the  $1 \times 10^{-3}$  cm/s (high) range and several in the  $1 \times 10^{-7}$  cm/s (low) range.



As transmissivity is independent of the length of the drillhole, a simplification of the results provided above in Table 3.5 was possible. In addition, transmissivities can be added or subtracted based on the features inferred to transmit groundwater. Note that transmissivity is related to hydraulic conductivity by  $T = kb$ , where  $T$  is transmissivity ( $m^2/s$ ),  $k$  is hydraulic conductivity (meters per second [ $m/s$ ]), and  $b$  is the test interval or aquifer thickness (in meters). Table 3.6, below, summarizes the hydrogeological properties for different bedrock intervals within the five drillholes.

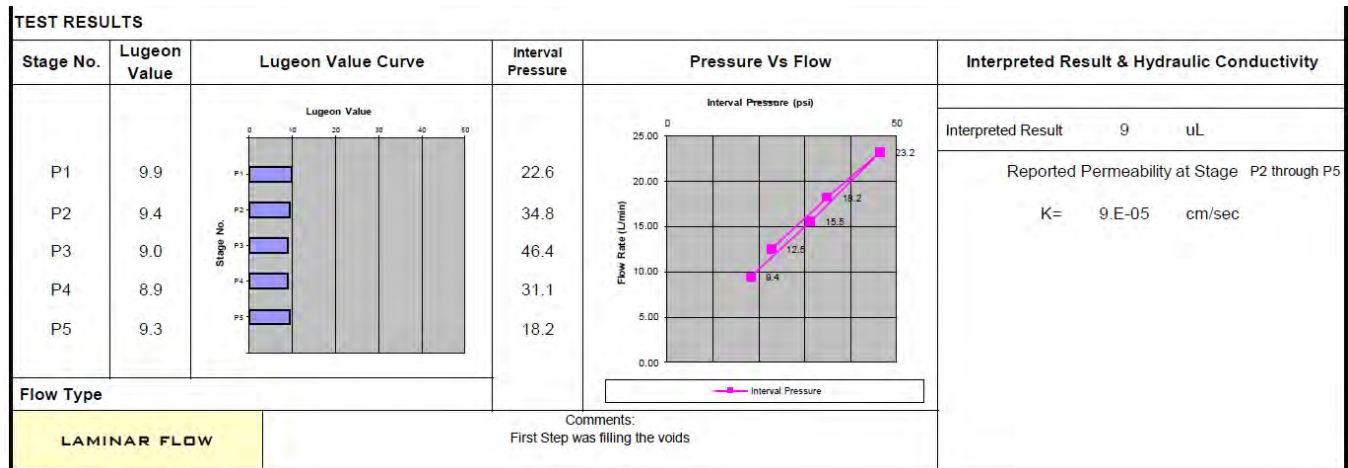


Figure 3.6: Lugeon Test Curve for Laminar Flow



**Table 3.5: McDonough AP-1 Spring 2023 Hydrogeological Testing Results Summary by Packer Test**

Borehole	Interval (ft BGS)	Interval Length (ft)	Soil/ Rock Layer	Test Sequence	Hydraulic Conductivity k (cm/s)	Transmissivity T (m <sup>2</sup> /s)
BW-1	27.7-45.0	17.3	PWR	Lugeon	3.E-06	1.E-07
BW-1	46.0-67.0	21.0	Bedrock	Constant Rate Injection	2.E-03	1.E-04
BW-1	61.2-78.0	16.8	Bedrock	Lugeon	1.E-03	7.E-05
BW-1	76.2-93.0	16.8	Bedrock	Lugeon	2.E-05	1.E-06
BW-2	Open BH, 80.3-ft TD	45.5	Bedrock	Constant Rate Injection	7.E-05	1.E-05
BW-2	68.9-84.1	15.2	Bedrock	Lugeon	2.E-04	8.E-06
BW-2	78.1-95.0	16.9	Bedrock	Lugeon	1.E-04	6.E-06
BW-2	96.1-110.0	13.9	Bedrock	Lugeon	5.E-06	2.E-07
BW-3	62.7-106.0	43.3	Bedrock	Lugeon	9.E-05	1.E-05
BW-3	77.7-106.0	28.3	Bedrock	Lugeon	6.E-05	5.E-06
BW-3	87.6-106.0	18.4	Bedrock	Lugeon	5.E-05	3.E-06
BW-4	82.3-131.0	48.7	Bedrock	Lugeon	2.E-05	3.E-06
BW-4	91.2-116.0	24.8	Bedrock	Lugeon	2.E-05	1.E-06
BW-4	113.1-131.0	17.9	Bedrock	Lugeon	1.E-05	5.E-07
BW-5	Open BH, 25.0-ft TD	16.7	PWR	Slug Withdrawal	1.E-04	5.E-06
BW-5	26.2-71.0	44.8	Bedrock	Lugeon	1.E-05	1.E-06
BW-5	54.1-71.0	16.9	Bedrock	Lugeon	2.E-05	1.E-06

Notes:

1. PWR - partially weathered rock
2. ft BGS - ft below ground surface
3. ft – feet
4. cm/s - centimeters per second
5. m<sup>2</sup>/s - square meters per second
6. Open borehole intervals tested from approximately the static water level to the total depth of the borehole at the time of testing before drilling was resumed.
7. BH – drillhole
8. TD - total depth



**Table 5.6: McDonough AP-1 Hydrogeological Bedrock Properties by Interval**

Drillhole	Interval (ft bgs)	Interval Length (ft)	Soil/ Rock Layer	Transmissivity T (m <sup>2</sup> /s)	Hydraulic Conductivity k (cm/s)
BW-1	46.0-67.0	21.0	Bedrock	1.E-04	2.E-03
BW-1	61.2-78.0	16.8	Bedrock	7.E-05	1.E-03
BW-1	76.2-93.0	16.8	Bedrock	1.E-06	2.E-05
BW-2	62.0-80.3	18.3	Bedrock	1.E-05	7.E-05
BW-2	68.9-84.1	15.2	Bedrock	8.E-06	2.E-04
BW-2	78.1-95.0	16.9	Bedrock	6.E-06	1.E-04
BW-2	96.1-110.0	13.9	Bedrock	2.E-07	5.E-06
BW-3	62.7-77.7	15.0	Bedrock	7.E-06	1.E-04
BW-3	77.7-87.6	9.9	Bedrock	3.E-06	9.E-05
BW-3	87.6-106.0	18.4	Bedrock	3.E-06	5.E-05
BW-4	82.3-113.1	30.8	Bedrock	3.E-06	3.E-05
BW-4	91.2-116.0	24.8	Bedrock	1.E-06	2.E-05
BW-4	113.1-131.0	17.9	Bedrock	5.E-07	1.E-05
BW-5	26.2-54.1	27.9	Bedrock	3.E-07	3.E-06
BW-5	54.1-71.0	16.9	Bedrock	1.E-06	2.E-05

Notes:

1. ft - feet
2. cm/s - centimeters per second
3. m<sup>2</sup>/s - square meters per second
4. PWR - partially weathered rock

## 4.0 DATA EVALUATION

### 4.1 Geotechnical Evaluation

#### 4.1.1 Rock Core Properties Evaluation

Previous investigation results indicated that rock quality increased with depth below top of rock. Table 4.1 compares rock core properties with depth below top of rock in approximately 10 ft intervals across the following categories: average fractures per foot, average recovery, average RQD, and weathering. At approximately 30 ft below top of rock, the quality of rock generally becomes more consistent with weathering noted to be fresh to slightly weathered, nearly full recovery, and reduced fracture frequency at more than 30 feet into rock at the drilled locations. RQD generally increased with depth, with the majority of RQD values more than 30 ft below top of rock above 50%. This indicates that the weathering horizon below top of rock is variable, but some simple correlations can be drawn showing that rock quality increases (weathering index decreases) with depth below top of rock. In addition, approximately 30 ft below top of rock is an inflection point where the rock is of relatively high quality below that point to the depths investigated. Figure 4.1 shows the differences in fracture frequency, weathering and RQD in the shallow and deeper (>30 ft) bedrock.



**Table 4.1: McDonough AP-1 Rock Core Properties**

Drillhole	Interval (ft)	Depth (ft bgs)	Average Fractures per Foot	Average Recovery (%)	Average RQD (%)	Weathering Index
BW-1	0.0-10.0	45.0-55.0	8	35	15	W2-W3
	10.0-20.0	55.0-65.0	-	-	-	-
	20.0-30.0	65.0-75.0	6	59	40	W1-W3
	30.0-40.0	75.0-85.0	3	96	69	W1
	40.0-48.0	85.0-93.0	1	100	80	W1
BW-2	0.0-10.0	62.0-72.0	17	64	5	W3-W4
	10.0-20.0	72.0-82.0	14	49	11	W2-W3
	20.0-30.0	82.0-92.0	17	60	33	W1-W3
	30.0-40.0	92.0-102.0	2	97	73	W1-W2
	40.0-48.0	102.0-110.0	4	96	50	W2
BW-3	0.0-10.0	58.0-68.0	16	37	17	W4
	10.0-20.0	68.0-78.0	20	30	53	W4
	20.0-30.0	78.0-88.0	11	72	83	W1-W4
	30.0-40.0	88.0-98.0	1	99	85	W1
	40.0-48.0	98.0-106.0	2	100	87	W1
BW-4	0.0-10.5	77.5-88.0	17	33	6	W4
	10.5-20.5	88.0-98.0	7	58	18	W2-W4
	20.5-30.5	98.0-108.0	5	88	56	W1-W3
	30.5-40.5	108.0-118.0	1	72	54	W1
	40.5-50.5	118.0-128.0	17	72	58	W1
	50.5-53.0	128.0-131.0	0	100	100	W1
BW-5	0.0-10.0	25.0-35.0	6	88	38	W2
	10.0-20.0	35.0-45.0	5	92	27	W1-W2
	20.0-30.0	45.0-55.0	12	80	7	W1-W2
	30.0-40.0	55.0-65.0	6	100	38	W1
	40.0-46.0	65.0-71.0	4	90	75	W1

Notes:

1. ft – feet
2. bgs – below ground surface
3. % - percent
4. "-" No data available at BW-1 due to driller error from 46.5 to 67.0 feet.
5. Averages taken from each run that was partially or fully within the interval.
6. Weathering Indices: W1 (Fresh), W2 (Slightly Weathered), W3 (Moderately Weathered), W4 (Highly Weathered)





**Figure 4.1: Example Photos of Upper and Lower Bedrock Zones in Core Photos of BW-3**

The above core photos of BW-3 show the decrease in fracture frequency and weathering, and an increase in RQD with depth. The top photograph shows 58 feet to 83 feet, and the lower photograph is 102 feet to 106 feet. Top of rock / base of PWR is approximately 58 ft-bgs.



## 4.1.2 Geotechnical Rock Strength Laboratory Data Evaluation

Point load tests were variable with UCS correlations varying across two orders of magnitude from 220 pounds per square inch (psi) to 23,004 psi. The UCS strengths appear to correlate to the degree of weathering of the samples tested and show scatter in the index strength results. Portions of all rock core holes tested show high correlated UCS strengths indicating the parent rocks at the site are strong and hard when fresh or slightly weathered ( $>10,000$  psi, and up to  $20,000$  psi) and showing local variability down to low strengths when highly weathered. These results indicate that consistent hard zones exist in the site bedrock that would provide resistance to mechanical disturbance.

The unit weights of both UCS samples were within the range of typically observed values for rock core samples. Although the two samples were different enough to suggest that weathering of core samples affects the unit weight of the rock and results could be variable. The moisture content results were both  $0.1\%$  which is typical for samples that have been allowed to dry before testing.

## 4.2 Hydrogeological Data Evaluation

The goals of the hydrogeological testing and analyses were:

- To verify and augment the previously collected bedrock hydraulic conductivities dataset
- Collect hydraulic conductivity data in the PWR where practical and sufficient PWR thickness was encountered
- To evaluate hydraulic conductivity conditions with depth below the top of rock

Only two tests were able to be performed in the PWR due to drilling limitations and a lack of meaningful PWR thickness observed in BW-2, BW-3, and BW-4. One test zone exhibited moderate hydraulic conductivity ( $1 \times 10^{-4}$  cm/s) and the other exhibited low hydraulic conductivity ( $3 \times 10^{-6}$  cm/s) with the average hydraulic conductivity being moderate ( $5 \times 10^{-5}$  cm/s) but noted to be across a very limited dataset (2 tests).

The amount of Long Island Creek Gneiss encountered in the five drillholes was limited to approximately six feet at the top of BW-5. Therefore, the bedrock was examined as one unit consisting of both the Long Island Creek Gneiss and the Button Schist. The bedrock packer testing results yielded a range of hydraulic conductivity results between relatively low ( $5 \times 10^{-6}$  cm/s) to high ( $1 \times 10^{-3}$  cm/s) across the tested intervals. The geometric mean of all 2023 packer test results was considered relatively moderate ( $5 \times 10^{-5}$  cm/s). A simple statistical analysis of the hydraulic properties of the PWR and bedrock is summarized, below, in Table 4.2. The standard deviations for the datasets are similar to an order of magnitude large than the geometric mean values indicating datasets with variability.



**Table 4.2: McDonough AP-1 Hydrogeological Properties by Unit**

Unit	Statistic	Transmissivity (m <sup>2</sup> /s)	Hydraulic Conductivity (cm/s)	Standard Deviation
Partially Weathered Rock (PWR)	Minimum	1.E-07	3.E-06	5.E-05
	Geometric Mean	<b>9.E-07</b>	<b>2.E-05</b>	
	Maximum	5.E-06	1.E-04	
Bedrock	Minimum	2.E-07	5.E-06	5.E-04
	Geometric Mean	<b>4.E-06</b>	<b>5.E-05</b>	
	Maximum	1.E-04	2.E-03	

Notes:

1. cm/s - centimeters per second
2. m<sup>2</sup>/s - square meters per second

#### 4.2.1 Assessment of Variation in the Bedrock Hydrogeological Properties Data

Based on our review of the hydrogeologic datasets, the test results were grouped into two datasets as a function of depth below top of rock. One dataset represents the upper 30 ft of bedrock and was observed to generally be highly fractured and moderately to highly weathered. The second dataset represents rock from approximately 30 ft below top of rock to the total depth of the drillholes. The deeper rock interval is slightly weathered to fresh, core recoveries were high, and fracture frequency was observed to be relatively lower than the upper bedrock zone. Table 4.3 shows the two datasets and compares the geometric means of the hydraulic conductivity values for each.

**Table 4.3: McDonough AP-1 Hydraulic Conductivities Compared to Depth Below Top of Rock**

Depth Below Top of Rock (ft)	Statistic	Geometric Mean Hydraulic Conductivity, K (cm/s)	Number of Tests	Standard Deviation
0.0-30.0	Minimum	3.E-06	10	6.E-04
	Geometric Mean	1.E-04		
	Maximum	2.E-03		
30.0-TD	Minimum	5.E-06	6	7.E-06
	Geometric Mean	2.E-05		
	Maximum	5.E-05		

Notes:

1. ft - feet
2. cm/s - centimeters per second
3. TD - total depth
4. One of the packer tests (BW-4\_91.2-116.0) was included in both data sets as significant portions of the test were in each zone.

The geometric mean of the hydraulic conductivity values for the upper 30 ft of bedrock is an order of magnitude higher than the geometric mean for the lower bedrock zone (from 30 ft below top of rock to the base of the drillhole). Based on these results, it may be appropriate to model the bedrock in two zones (shallow bedrock and



deep bedrock) for modelling and design purposes with the shallow bedrock having increased permeability, higher weathering, and higher fracture frequency.

The lower bedrock zone showed more consistent results; the standard deviation is two orders of magnitude less than the standard deviation for the upper bedrock zone. Results at depths greater than 30 ft below top of rock trend towards relatively consistent properties (more uniform) with some variability in the hydrogeologic properties with depth following local weathering and fracture infilling observations. The upper bedrock generally has higher hydraulic conductivities except where local infilling or other features serve to inhibit flow.

Hydraulic conductivity values are expected to vary spatially due to localized variations in subsurface materials, weathering horizons, and geomorphology, including former river channels, variable bedrock weathering, varying thicknesses of PWR, proximity to historic faulting, etc. Table 4.4 presents the spatial variation of the hydraulic conductivities around AP-.

**Table 4.4: McDonough AP-1 Hydraulic Conductivities in each Drillhole**

Drillhole	Group of Packer Tests	Geometric Mean Hydraulic Conductivity, K (cm/s)	Number of Tests
BW-1	All Tests in Borehole	4.E-04	3
	0 to 30 ft below TOR	1.E-03	2
	30 ft below TOR to Total Depth	2.E-05	1
BW-2	All Tests in Borehole	5.E-05	4
	0 to 30 ft below TOR	1.E-04	3
	30 ft below TOR to Total Depth	5.E-06	1
BW-3	All Tests in Borehole	9.E-05	3
	0 to 30 ft below TOR	1.E-04	2
	30 ft below TOR to Total Depth	5.E-05	1
BW-4	All Tests in Borehole	2.E-05	3
	0 to 30 ft below TOR	2.E-05	2
	30 ft below TOR to Total Depth	1.E-05	2
BW-5	All Tests in Borehole	9.E-06	2
	0 to 30 ft below TOR	3.E-06	1
	30 ft below TOR to Total Depth	2.E-05	1

Notes:

1. ft - feet
2. cm/s - centimeters per second
3. PWR packer tests are not included
4. Results use a geometric mean if two or more tests available. If only one test available, the singular hydraulic conductivity is reported.

## 4.2.2 Identification of Bedrock Features

Analysis of the geophysical logs, geological/geotechnical core logs and packer test results were compared to identify zones or discrete features that exhibit elevated hydraulic conductivity. Appendix G shows the geophysical logs plotted with the hydrogeological testing data alongside. These logs allow for the comparison of geophysical results with the hydrogeological results side by side and against depth in the drillhole. Figure 4.1 presents BW-4's log with the hydrogeological data plotted alongside the geophysical results with the remaining logs provided in



Appendix G. Table 4.4 below compares the estimated hydraulic conductivity per interval to the material tested, weathering, and average fracture frequency in that zone. Table 4.5 presents potentially water-bearing features from the geophysical or geological/geotechnical logs and cross-references those features to the associated packer test result.

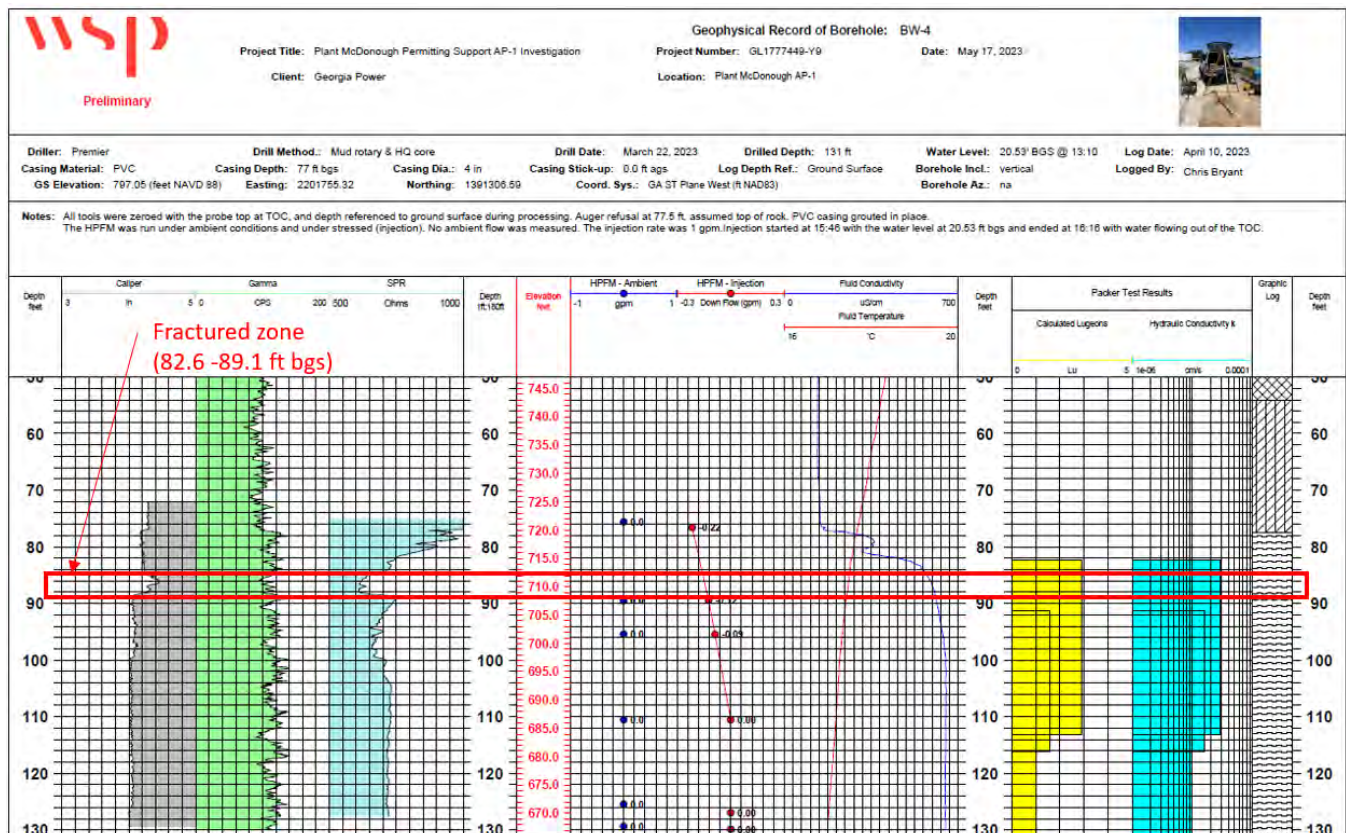


Figure 4.2: BW-4 Geophysical and Hydrogeological Log with a Fracture Zone Identified



**Table 4.5: Comparison of Estimated Hydraulic Conductivity to Geotechnical Drillhole Logs**

Bore-hole ID	Estimated Hydraulic Conductivity per Interval		Material	Average Fracture Frequency (Fractures/ft)	Weathering
	Interval (ft bgs)	K (cm/s)			
BW-1	27.7-45.0	3.E-06	PWR (39.5-45.0)	NA	NA
	46.0-67.0	2.E-03	Bedrock	8	W2
	61.2-78.0	1.E-03	Bedrock	5	W2
	76.2-93.0	2.E-05	Bedrock	2	W1
BW-2	62.0-80.3	7.E-05	Bedrock	16	W2 to W4
	68.9-84.1	2.E-04	Bedrock	13	W2 to W4
	78.1-95.0	1.E-04	Bedrock	14	W2 to W3
	96.1-110.0	5.E-06	Bedrock	3	W1
BW-3	62.7-77.7	1.E-04	Bedrock	19	W4
	77.7-87.6	9.E-05	Bedrock	12	W2 to W4
	87.6-106.0	5.E-05	Bedrock	1	W1 to W2
BW-4	82.3-113.1	3.E-05	Bedrock	8	W1 to W4
	91.2-116.0	2.E-05	Bedrock	4	W1 to W3
	113.1-131.0	1.E-05	Bedrock	10	W1
BW-5	10.5-25.0	1.E-04	PWR (10.5-25.0)	NA	NA
	26.2-54.1	3.E-06	Bedrock	8	W2
	54.1-71.0	2.E-05	Bedrock	5	W2

Notes:

1. ft - feet
2. bgs - below ground surface
3. cm/s - centimeters per second
4. Broken core zones and lost core zones due to highly fractured rock are assumed to have 2 fractures per inch or a maximum of 24 fractures per foot.
5. K - hydraulic conductivity
6. PWR - partially weathered rock
7. NA - not applicable
8. Weathering Codes: W1 (Fresh), W2 (Slightly Weathered), W3 (Moderately Weathered), W4 (Highly Weathered)
9. PWR (XX.X-XX.X) - depths that PWR has been identified within the test zone



**Table 4.6: Summary of Main Bedrock Features from 2023 Investigations**

Bore Hole ID	Features Identified in Geological/Geotechnical Drillhole Logs and Geophysical Logs			Estimated Hydraulic Conductivity per Interval	
	Feature Depth (ft bgs)	Log Type	Feature	Intervals (ft bgs)	K (cm/s)
BW-1	39.5-45.0	Geo	PWR present from 39.5 to 45.0 ft bgs	27.7-45.0	3.E-06
	43.5	Caliper	Fracture at base of casing	27.7-45.0	3.E-06
	52.0	Caliper	Fracture	46.0-67.0	2.E-03
	71.6	Geo	0.8 ft lost core zone	61.2-78.0	1.E-03
	83.2	Geo	Multiple fractures with FeOx staining	76.2-93.0	2.E-05
BW-2	62.0-67.9	Geo	5.9 ft lost core zone	62.0-80.3	7.E-05
	71.0	Caliper	Fracture	62.0-80.3	7.E-05
				68.9-84.1	2.E-04
	73.8-76.4	Geo	2.6 ft lost core zone	62.0-80.3	7.E-05
				68.9-84.1	2.E-04
	78.0	Caliper	Fracture	62.0-80.3	7.E-05
				68.9-84.1	2.E-04
	81.3-87.8	Geo	6.5 ft lost core zone	68.9-84.1	2.E-04
BW-3	65.3	Geo, Caliper, and FTC	Fracture within a broken and lost core zone (61.0-66.0)	62.7-77.7	1.E-04
	70.5	Geo, Caliper, and FTC	Fracture	62.7-77.7	1.E-04
	70.0-82.0	Geo	Highly fractured zone denoted by broken and lost core zone (70.0-82.0)	62.7-77.7	1.E-04
				77.7-87.6	9.E-05
BW-4	91.2-91.4	Geo	Broken core zone	87.6-106.0	5.E-05
	82.6-89.1	Geo	Highly fractured zone denoted by broken and lost core	82.3-113.1	3.E-05
	98.0-99.2	Geo	Highly fractured zone denoted by broken and lost core	82.3-113.1	3.E-05
BW-5	10.5-25.0	Geo	PWR present from 10.5 to 25.0 ft bgs	10.5-25.0	1.E-04
	46.9	Geo	High angle joint with FeOx staining	26.2-54.1	3.E-06
	60.0	Geo	Fracture with FeOx staining and alteration	54.1-71.0	2.E-05

Notes:

1. Some fractures are within two packer test intervals could contribute to the estimated hydraulic conductivity in both tests.
2. ft - feet
3. bgs - below ground surface
4. cm/s - centimeters per second
5. Broken core zones and lost core zones are assumed to indicate highly fractured zones.
6. K - hydraulic conductivity (values listed are from packer testing of the test zone feature is present within)
7. PWR - partially weathered rock
8. NA - not applicable
9. Geo – Geotechnical/Geological logs



#### **4.2.2.1 BW-1**

The test from 27.7-45.0 ft bgs comprised a mixture of PWR and overburden. Continuous PWR was encountered from 39.5-45.0 ft bgs with intermittent PWR and Sandy Clayey Silt interbedded from 27.7-39.5 ft bgs. The fracture frequency and weathering decrease with depth. The geophysical logs indicate a water bearing fracture at 52 ft bgs that coincides with the loss of drilling fluid. At 71.2-72.0 ft bgs a 0.8 foot highly fractured rock zone (indicated by lost core) was observed. The hydraulic conductivities for intervals 46.0-67.0 and 61.2-78.0 ft bgs are  $2 \times 10^{-03}$  cm/s and  $1 \times 10^{-03}$  cm/s. The test interval 76.2-93.0 ft bgs exhibited a hydraulic conductivity value of  $2 \times 10^{-05}$  cm/s which may originate from the iron oxide (FeOx) stained fractures at approximately 83.2 ft bgs.

#### **4.2.2.2 BW-2**

There was limited PWR in BW-2 (1.5 ft) and it was not tested. In the bedrock, fracture frequency was above 10 fractures per foot (fractures/ft) for the upper 33 ft of the drillhole and decreased to 3 fractures/ft in the lower 15 ft of the drillhole. Similarly, the weathering ranged from slightly weathered to highly weathered in the upper 33 ft of the drillhole, while the lower 15 ft of the drillhole was fresh rock. The hydraulic conductivity ranges from  $7 \times 10^{-05}$  to  $2 \times 10^{-04}$  cm/s in the upper 33 feet to  $5 \times 10^{-06}$  cm/s below 33-35 ft below top of rock.

The features inferred to be contributing the most flow within BW-2 are likely the highly fractured zones 81.3-87.8 and 89.2-90.0 ft bgs, with some flow coming from fractures and fractured zones at 62.0-67.9, 71.0, 73.8-76.4, and 78.0 ft bgs. Below 90.0 ft bgs, the rock exhibits higher resistivity, higher gamma counts, and is harder. This generally coincides with a rock demonstrating less fracturing, less weathering and increased RQDs with depth. The lower interval exhibits relatively low hydraulic conductivity but there are weathered fractures in the core that exhibit signs of water movement, notably at 102.5 ft bgs.

#### **4.2.2.3 BW-3**

In BW-3, there was no PWR observed. The fracture frequency and weathering of the bedrock decreased with depth, from 19 to 1 fractures/ft, and highly weathered to slightly weathered. The hydraulic conductivity also decreased with depth as noted below.

- Test 1 -  $1 \times 10^{-04}$  (~5 to ~20 ft below top of rock)
- Test 2 -  $9 \times 10^{-05}$  (~20 to ~30 ft below top of rock)
- Test 3 -  $5 \times 10^{-05}$  (~30 to ~48 ft below top of rock)

Inferred transmissive zones within the intervals for Tests 1 and 2 in BW-3 are fracture zones at 61.0- 66.0 and 70.0- 82.0 ft bgs. The gamma, SPR, and caliper geophysical logs show corresponding inflections at 82 ft depth. The formation below 82 ft bgs exhibits higher resistivity, higher gamma counts, and is harder. FTC logs indicate possible flow in this interval inferred to originate from a small broken core zone from 91.2 to 91.4 ft bgs.

#### **4.2.2.4 BW-4**

In BW-4 there was no PWR observed. The fracture frequency in BW-4 remained similar throughout the drillhole ranging from 4 to 10 fractures/ft on average in the test zones. Weathering was variable in the upper 35 ft ranging from fresh to highly weathered. The lower 15-18 ft of the drillhole was fresh. The gamma, SPR, and caliper geophysical logs show an inflection at 99.5 ft depth (~22 ft below top of rock) where the formation below becomes more resistive, higher gamma counts, and harder. This coincides with an increase in the RQD and rock strength and a decrease in weathering.



Estimated hydraulic conductivities were similar throughout the drillhole with estimated results all having hydraulic conductivities ranging from  $1 \times 10^{-05}$  to  $3 \times 10^{-05}$  cm/s. Three highly fractured zones (82.6- 89.1, 98.0-99.2, and 119.2- 126.0 ft bgs) are noted in the geotechnical logs by broken core or lost core and are likely the primary contributors to the flow within BW-4.

#### 4.2.2.5 BW-5

BW-5 had the thickest interval of PWR compared to each drillhole tested, with 15 ft of PWR (10.5- 25 ft bgs). The PWR was tested in an open drillhole with a slug withdrawal test with the water level at 8.32 ft bgs. Therefore, it was primarily the PWR being tested. The PWR had an estimated hydraulic conductivity of  $1 \times 10^{-04}$  cm/s. Fracture frequency and weathering in BW-5's bedrock was similar throughout, with average fractures per foot ranging from 5 to 8 per interval and slightly weathered. Below the PWR, the hydraulic conductivity values were lower, with the interval from 26.2- 54.1 ft bgs exhibiting a hydraulic conductivity of  $3 \times 10^{-06}$  and the interval from 54.1- 71.0 ft bgs exhibiting a hydraulic conductivity of  $2 \times 10^{-05}$ . There was no geophysical logging of BW-5. However, the rock core exhibited multiple areas with iron oxide-stained fractures and weathered rock zones that indicate groundwater movement through the rock.

## 5.0 COMPARISON OF 2023 FIELD INVESTIGATION DATA TO PREVIOUS DATA SETS

### 5.1 Elevations and Thicknesses of Units

The encountered depths, equivalent elevations, and actual thicknesses of geologic units encountered were compared to expected values correlated from drillhole logs, top of rock maps, and geologic cross sections from the Hydrogeologic Assessment Report (HAR) (WSP, 2023). Differences in elevations and thicknesses were both above and below expectations indicating variable site geology. Table 5.1 summarizes the expected, actual, and differences between the two for soil thickness, PWR elevations and thickness, along with top of rock elevation.

**Table 5.1: Expected versus Actual Elevations and Thickness of Units**

Bore hole ID	Overburden			PWR						Top of Rock		
	Thickness (ft)			Elevation			Thickness			Elevation (ft)		
	Expec.	Actual	$\Delta$	Expec.	Actual	$\Delta$ . (ft)	Expec.	Actual	$\Delta$ . (ft)	Expected	Actual	$\Delta$
BW-1	43.0	39.5	3.5	747.0	750.4	3.4	14.0	5.5	8.5	733.0	744.9	11.9
BW-2	71.0	60.5	10.5	-	729.3	-	-	1.5	1.5	719.0	727.8	8.8
BW-3	65.0	58.0	7.0	-	-	-	-	-	-	717.0	731.7	14.7
BW-4	60.0	77.5	-17.5	-	-	-	-	-	-	730.0	719.6	-10.4
BW-5	10.0	10.5	-0.5	775.0	769.2	-5.8	15.0	14.5	0.5	760.0	764.9	4.9

**Notes:**

- Elevations are referenced to the 1988 National Vertical Datum.
- ft – feet
- Epec. – Expected
- $\Delta$  – Change/difference
- PWR - partially weathered rock
- "-" PWR was not expected or present in drillhole.
- For BW-2: GW-3c, 05-04-2018, Geologic Cross Section Schematic C-C', shows PWR below expected top of rock, so no PWR was expected. However, PWR was found at an elevation comparable to nearby Drillhole AP1-B-12. Using this expected elevation of 731.0 ft, the PWR elevation difference would be -1.7 ft.
- Top of rock elevations based on GW-2, 05-04-2018, Estimated Top of Rock Map, Hydrogeologic Assessment Report (HAR) by WSP.



9. PWR elevations estimated from GW-3b and GW-3c, 05-04-2018, Geologic Cross Section Schematic B-B' and C-C', Hydrogeologic Assessment Report (HAR) by WSP.
10. Negative thickness differences mean there was less of a material than expected while positive thickness differences indicate there was more of a material than expected.
11. Negative elevation differences mean the unit was encountered lower than expected while positive elevation differences indicate the unit was encountered above where it was expected.

Some variability between previously estimated top of PWR and top of rock was observed across the new investigations, reinforcing the previously understood trend that PWR, rock conditions, and elevations can vary tens of feet locally across small distances onsite.

## **5.2 Geotechnical Properties**

### **5.2.1 Comparison to Previous Investigations**

In 2017, an investigation around AP-1 was performed including soil drilling, rock coring, geological logging, geophysical logging, and hydrogeological testing. The core logs from 2017 (contained in the HAR) contained similar information as the 2023 investigation and a comparison was made between the results of the two studies to evaluate if updates are warranted to update numerical groundwater model results. Table 5.2 shows fracture frequency, recovery, RQD, and weathering in relation to depth below top of rock in approximately 10 ft intervals for both the 2017 and 2023 drillholes.

The data is similar between the two investigations, with weathering ranging from moderately to highly weathered and becoming fresher with depth, core recovery and RQD generally increasing with depth, and fractures per foot decreasing with depth. Like the 2023 data, approximately 30 ft below top of rock is the point where the rock core from the 2017 investigation improves.



**Table 5.2: 2017 versus 2023 Geotechnical Core Logs Data Comparison**

Drillhole		Interval (ft)	Depth (ft bgs)	Average Fractures per Foot	Average Recovery (%)	Average RQD (%)	Weathering Index
2023	BW-1	0.0-10.0	45.0-55.0	8	35	15	W2-W3
		10.0-20.0	55.0-65.0	-	-	-	-
		20.0-30.0	65.0-75.0	6	59	40	W1-W3
		30.0-40.0	75.0-85.0	3	96	69	W1
		40.0-48.0	85.0-93.0	1	100	80	W1
	BW-2	0.0-10.0	62.0-72.0	17	64	5	W3-W4
		10.0-20.0	72.0-82.0	14	49	11	W2-W3
		20.0-30.0	82.0-92.0	17	60	33	W1-W3
		30.0-40.0	92.0-102.0	2	97	73	W1-W2
		40.0-48.0	102.0-110.0	4	96	50	W2
	BW-3	0.0-10.0	58.0-68.0	16	37	17	W4
		10.0-20.0	68.0-78.0	20	30	53	W4
		20.0-30.0	78.0-88.0	11	72	83	W1-W4
		30.0-40.0	88.0-98.0	1	99	85	W1
		40.0-48.0	98.0-106.0	2	100	87	W1
	BW-4	0.0-10.5	77.5-88.0	17	33	6	W4
		10.5-20.5	88.0-98.0	7	58	18	W2-W4
		20.5-30.5	98.0-108.0	5	88	56	W1-W3
		30.5-40.5	108.0-118.0	1	72	54	W1
		40.5-50.5	118.0-128.0	17	72	58	W1
	BW-5	0.0-10.0	25.0-35.0	6	88	38	W2
		10.0-20.0	35.0-45.0	5	92	27	W1-W2
		20.0-30.0	45.0-55.0	12	80	7	W1-W2
		30.0-40.0	55.0-65.0	6	100	38	W1
		40.0-46.0	65.0-71.0	4	90	75	W1
2017	AP1-B-11	0.0-10.0	41.0-51.0	11	71	15	W3-W4
		10.0-20.0	51.0-61.0	16	82	30	W3-W4
		20.0-30.0	61.0-71.0	11	95	51	W3
		30.0-39.0	71.0-80.0	3	95	61	W3
	AP1-B-12	0.0-10.0	32.1-42.1	19	44	3	W4
		10.0-20.0	42.1-52.1	16	47	12	W2-W4
		20.0-30.0	52.1-62.1	7	81	27	W2
		30.0-40.0	62.1-72.1	4	97	55	W1-W2
		40.0-42.0	72.1-74.1	3	98	72	W1
	AP1-B-13	0.0-10.0	17.0-27.0	19	41	23	W4 to W5
		10.0-20.0	27.0-37.0	2	82	57	W2 to W4
		20.0-30.0	37.0-47.0	17	79	23	W2 to W3
		30.0-40.0	47.0-57.0	8	99	33	W2 to W3
		40.0-48.0	57.0-65.0	5	95	48	W2

Notes:

1. ft – feet
2. bgs – below ground surface
3. % - percent
4. "-" No data available at BW-1 due to driller error from 46.5 to 67.0 feet.
5. Averages taken from each run that was partially or fully within the interval.
6. Weathering Indices: W1 (Fresh), W2 (Slightly Weathered), W3 (Moderately Weathered), W4 (Highly Weathered), W5 (Completely Weathered).

## 5.3 Hydrogeological Properties

### 5.3.1 Comparison to Existing Hydrogeological Data

A comparison of data collected in the three drillholes and ten tests in 2017 and the five drillholes and 15 (bedrock) tests in 2023 was performed. Table 5.3 displays all the packer testing data by interval for each investigation.



**Table 7.3: 2017 and 2023 Packer Test Data by Interval**

	Drillhole	Interval	Interval Length (ft)	Soil/ Rock Layer	Hydraulic Conductivity, K (cm/s)
2023 Data	BW-1	27.7-45.0	17.3	PWR	3.E-06
	BW-1	46.0-67.0	21.0	Bedrock	2.E-03
	BW-1	61.2-78.0	16.8	Bedrock	1.E-03
	BW-1	76.2-93.0	16.8	Bedrock	2.E-05
	BW-2	62.0-80.3	18.3	Bedrock	7.E-05
	BW-2	68.9-84.1	15.2	Bedrock	2.E-04
	BW-2	78.1-95.0	16.9	Bedrock	1.E-04
	BW-2	96.1-110.0	13.9	Bedrock	5.E-06
	BW-3	62.7-77.7	15.0	Bedrock	1.E-04
	BW-3	77.7-87.6	9.9	Bedrock	9.E-05
	BW-3	87.6-106.0	18.4	Bedrock	5.E-05
	BW-4	82.3-113.1	30.8	Bedrock	3.E-05
	BW-4	91.2-116.0	24.8	Bedrock	2.E-05
	BW-4	113.1-131.0	17.9	Bedrock	1.E-05
	BW-5	10.5-25.0	14.5	PWR	1.E-04
	BW-5	26.2-54.1	27.9	Bedrock	3.E-06
	BW-5	54.1-71.0	16.9	Bedrock	2.E-05
2017 Data	AP1-B-11	48.0-58.0	10.0	Bedrock	1.E-03
	AP1-B-11	53.0-63.0	10.0	Bedrock	1.E-03
	AP1-B-11	63.0-81.0	18.0	Bedrock	8.E-04
	AP1-B-12	35.0-45.0	10.0	Bedrock	3.E-04
	AP1-B-12	39.0-49.0	10.0	Bedrock	7.E-04
	AP1-B-12	48.5-58.5	10.0	Bedrock	7.E-04
	AP1-B-12	57.6-71.0	13.4	Bedrock	5.E-04
	AP1-B-13	22.0-32.0	10.0	Bedrock	2.E-03
	AP1-B-13	32.0-42.0	10.0	Bedrock	9.E-04
	AP1-B-13	40.0-65.0	25.0	Bedrock	9.E-05

Notes:

1. PWR - partially weathered rock
2. ft - feet
3. cm/s - centimeters per second
4. For the 2017 data, used the hydraulic conductivities estimated using HydroBench.

Similar to the 2023 investigation data, the lowest hydraulic conductivities in 2017 were at the base of the drillhole. One difference between the two investigations is the 2023 drillholes were taken slightly deeper, averaging 49 ft into rock in 2023 compared to 42 ft in 2017. This allowed the 2023 investigation packer tests to have a test interval greater than 30 feet below the top of rock (i.e., completely within the below 30 ft interval estimated to be less fractured and weathered). A summary comparison between the 2017 and 2023 field investigation data is shown in Table 5.4. For the 2023, the data was parsed into two bedrock zones (0-30 ft below top of rock and 30 ft below top of rock to total depth).



**Table 5.4: 2017 and 2023 Geometric Means of Hydraulic Conductivities**

Data Sets	Group of Packer Tests	Geometric Mean Hydraulic Conductivity, K (cm/s)	Number of Tests
<b>2017 Data</b>	All 2017 Tests	6.E-04	10
<b>2023 Data</b>	All 2023 Tests	5.E-05	15
	0 to 30 ft below TOR	1.E-04	10
	30.0 ft below TOR to TD	2.E-05	6
<b>Combined 2017 and 2023 Data</b>	All Bedrock Tests	1.E-04	25
	2017 Tests and 2023 Upper Bedrock Tests	2.E-04	20
	2023 Lower Bedrock Tests and Deepest 2017 Tests	4.E-05	9

Notes:

1. cm/s - centimeters per second
2. For the 2017 data, used the hydraulic conductivities estimated using HydroBench
3. TOR - top of rock
4. 2023 Upper Bedrock Tests are the tests covering 0 to 30 ft below top of rock
5. 2023 Lower Bedrock Tests are the tests covering 30 ft below top of rock to the bottom of the drillhole
6. Deepest 2017 Tests refers to the deepest test in each of the three drillholes. These tests are included in both data sets because they span the dividing line of 30 ft below top of rock
7. TD – total depth

The 2023 packer test results indicated that there is spatial variability in hydrogeologic conditions across the site within the same units as would be expected for the geologic conditions as the site. The 2017 data set does not have the same amount of variability when the geometric means of the tests in each drillhole are calculated. The 2017 data by drillhole is all within a half order of magnitude while the 2023 varies across almost 3 orders of magnitude.

The three drillholes completed in 2017 and their locations compared to the drillholes completed in 2023 can be seen on Drawing Sheet 1. AP1-B-11 is located to the south of AP-1 in between BW-2 and BW-3 and has a higher hydraulic conductivity by approximately a half order of magnitude and a full order of magnitude, respectively. AP1-B-12 is within 300 ft of BW-2, and they have approximately an order of magnitude difference in conductivities. AP1-B-13 is about 800 feet northeast of BW-5 and has an approximately 1.5 orders of magnitude larger geometric mean of hydraulic conductivity.

When the 2023 data from 0-30 ft below top of rock is compared to the 2017 data (which is predominantly 0-30 ft rock data), there is only about a half order of magnitude difference between the geometric mean values of the datasets. This supports that the bedrock layer may not act as a homogenous unit and may be more accurately characterized as an upper moderately to highly fractured and weathered bedrock zone and a lower bedrock zone that is less fractured and only slightly weathered.

In summary, there is spatial variability of hydraulic conductivity across the Site, and it appears the testing the upper bedrock zone yields more variability than the testing in the lower portions of the drillhole. Table 5.5 compares the geometric means of all tests completed in each drillhole.



**Table 5.5: 2017 and 2023 Spatial Variability of Hydraulic Conductivity**

Data Sets	Drillhole	Group of Packer Tests	Geometric Mean Hydraulic Conductivity, K (cm/s)	Number of Tests
2017 Data	AP1-B-11	All Tests in Borehole	9.E-04	3
		Upper Bedrock Zone: Tests above 30 ft below TOR	1.E-03	2
		Straddling Upper and Lower bedrock zones	8.E-04	1
	AP1-B12	All Tests in Borehole	5.E-04	4
		Upper Bedrock Zone: Tests above 30 ft below TOR	5.E-04	3
		Straddling Upper and Lower bedrock zones	5.E-04	1
	AP1-B13	All Tests in Borehole	5.E-04	3
		Upper Bedrock Zone: Tests above 30 ft below TOR	1.E-03	2
		Straddling Upper and Lower bedrock zones	9.E-05	1
2023 Data	BW-1	All Tests in Borehole	4.E-04	3
		Upper Bedrock Zone: 0 to 30 ft below TOR	1.E-03	2
		Lower Bedrock Zone: 30 ft below TOR to Total Depth	2.E-05	1
	BW-2	All Tests in Borehole	5.E-05	4
		Upper Bedrock Zone: 0 to 30 ft below TOR	1.E-04	3
		Lower Bedrock Zone: 30 ft below TOR to Total Depth	5.E-06	1
	BW-3	All Tests in Borehole	9.E-05	3
		Upper Bedrock Zone: 0 to 30 ft below TOR	1.E-04	2
		Lower Bedrock Zone: 30 ft below TOR to Total Depth	5.E-05	1
	BW-4	All Tests in Borehole	2.E-05	3
		Upper Bedrock Zone: 0 to 30 ft below TOR	2.E-05	2
		Lower Bedrock Zone: 30 ft below TOR to Total Depth	1.E-05	2
	BW-5	All Tests in Borehole	9.E-06	2
		Upper Bedrock Zone: 0 to 30 ft below TOR	3.E-06	1
		Lower Bedrock Zone: 30 ft below TOR to Total Depth	2.E-05	1

Notes:

1. cm/s - centimeters per second
2. For the 2017 data, used the hydraulic conductivities estimated using HydroBench
3. PWR packer tests are not included
4. Used a geometric mean if there were two or more tests available. If only one test available, re-stated that hydraulic conductivity.
5. The lowest test in each of the 2017 drillholes tests above and below 30 ft below top of rock
6. TOR – top of rock



## 5.4 Conceptual Site Hydrogeologic Model Summary

As presented in the HAR, a regional, unconfined aquifer system is present at the Site. Groundwater flow occurs in the overburden, PWR and bedrock, as is typical in Piedmont geology. The degree of groundwater flow between the overburden and PWR and bedrock is dependent on the degree of hydraulic connectivity between the units. The bedrock may be characterized as an upper moderately to highly fractured and weathered bedrock zone and a lower bedrock zone that is less fractured and less weathered.

Other attributes of the site-specific hydrogeologic model include:

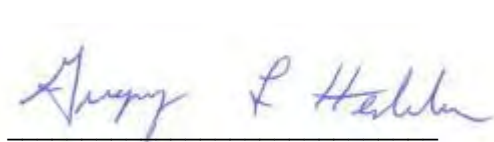
- The Site is directly underlain by a variably thick blanket of overburden and PWR (approximately 10 to 80-feet thick). The overburden model layer consists of residuum and saprolite and is underlain by the PWR model layer. Based on field hydraulic conductivity tests, the overburden is estimated to have an average horizontal hydraulic conductivity of around  $10^{-4}$  cm/sec. Part of the test data used to derive the hydraulic conductivity value in this unit is from site slug tests. In the slug tests, the screened interval often extended through the residuum and saprolite and into the PWR and upper bedrock. Previous hydraulic conductivity values specifically for the PWR was not available prior to this investigation.
- Bedrock north of the faulted intrusive contact is characterized as Long Island Creek Gneiss (Ozli), described as felsic sphene-epidote-biotite-quartz-feldspar gneiss with well-developed foliation and an augen texture reflecting historical movement/deformation near fault and shear zones of the inactive Brevard fault zone. South of the faulted intrusive contact is primarily characterized by interlayered Ordovician age phyllonite, button schist (OZbs) with well-developed shear foliation, fine-grained mylonite with poorly developed foliation, and very fine-grained mylonitic biotite gneiss with well-developed shear foliation.
- Hydraulic conductivity in the upper weathered bedrock zone is considered slightly higher but more variable than the lower, less weathered bedrock zone.
- Two lineament sets (i.e., L1 and L2) were identified onsite that orientations are consistent with the structural stresses experienced in this area.
- The top of rock surface and water table generally mimic site topography.
- The uppermost aquifer occurs within the overburden, PWR, and upper bedrock at the Site. According to water levels measured from August 2016 to January 2023 from wells and piezometers screened in the overburden, PWR, and upper bedrock, the depth to saturation varies from approximately 1.2 to 46.4 feet below ground surface (ft bgs) across the Site and is variable with topography. Calculated geometric means for depth to saturation were similar in both formations. The deeper (i.e., greater than 30 feet) in the bedrock aquifer is foliated, with fracture occurrence generally decreasing with depth.
- The potentiometric surface for the uppermost aquifer indicates groundwater flows generally west south-west across AP-1.
- Across the Site, vertical gradients are expected to occur downward in topographically highs and upwards near topographic lows.



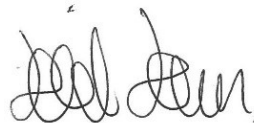
## 6.0 REFERENCES

- Chapman, M., M. Schlegel, B. A. Huffman, and K. B. McSwain, 2007, Hydraulic Gradients in Recharge and Discharge Areas and Apparent Ground-Water Age Dates from the Characterization of Multiple Regolith fractured bedrock ground-water research stations in North Carolina, Proceedings of the 2007 Georgia Water Resources Institute Proceedings held March 27-29, 2007, at The University of Georgia, Athens.
- Fetter, C. W., 1988, Applied Hydrogeology.
- Golder, 2017a, Drillhole Geophysical Services, November 13, 2017
- Golder, 2017b, Water Pressure Test for B-11, B-12 and B-13
- Golder, 2018, Three-Dimensional Numerical Groundwater and Fate and Transport Modelling Report – Rev1
- Golder, 2020, Three-Dimensional Numerical Groundwater Modeling Summary Report, Georgia Power- Plant McDonough, Cobb County, Georgia, Golder Associates Inc., Rev 05, October 2020
- Golder, 2021, Three-Dimensional Numerical Groundwater Modeling Summary Report Addendum, Georgia Power – Plant McDonough, Cobb County, Georgia, Golder Associates Inc., November 22, 2021
- Golder, 2021b, Plant McDonough Atkinson CCR Unit AP-1, Advanced Engineering Methodologies and Stormwater Improvements. Barrier Wall Profile Sheets 1 and 2.
- LeGrand, Sr., H. E., 2004, Master Conceptual Model for Hydrogeological Site Characterization in the Piedmont and Mountain Region of North Carolina: A Guidance Manual.
- Northwest Atlanta, GA USGS 7.5-minute topographic quadrangle – 2014
- Robinson, J. L., Journey, C. A., Atkins, J B, 1996, Ground-Water Resources of the Coosa River Basin in Georgia and Alabama - Subarea 6 of the Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa River Basins, USGS Report 96-177.
- WSP USA, 2023, Part B Section 1 Hydrogeological Assessment Report, Plant McDonough-Atkinson, CCR Surface Impoundment (CCR Unit AP-1), Cobb County, Georgia (HAR), Revision 06 December 2023

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## **APPENDICES**

### **APPENDIX A**

Drawing Sheets

### **APPENDIX B**

Drillhole Logs

### **APPENDIX C**

Photologs

### **APPENDIX D**

Geotechnical Laboratory Results

### **APPENDIX E**

Geophysical Investigation Technical Memorandum

### **APPENDIX F**

Hydrogeological Investigation Technical Memorandum

### **APPENDIX G**

Geophysical and Hydrogeological Drillhole Logs



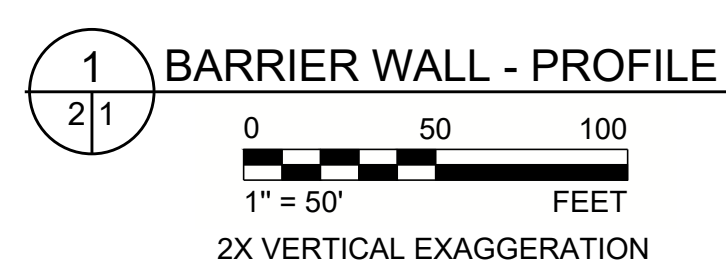
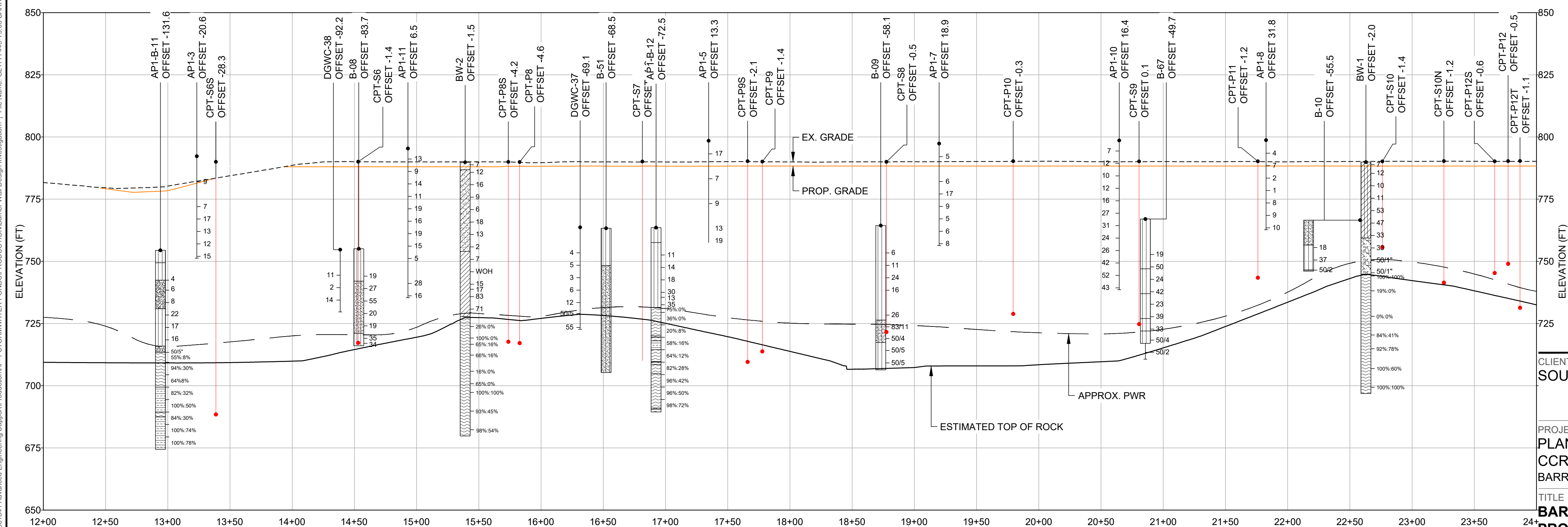
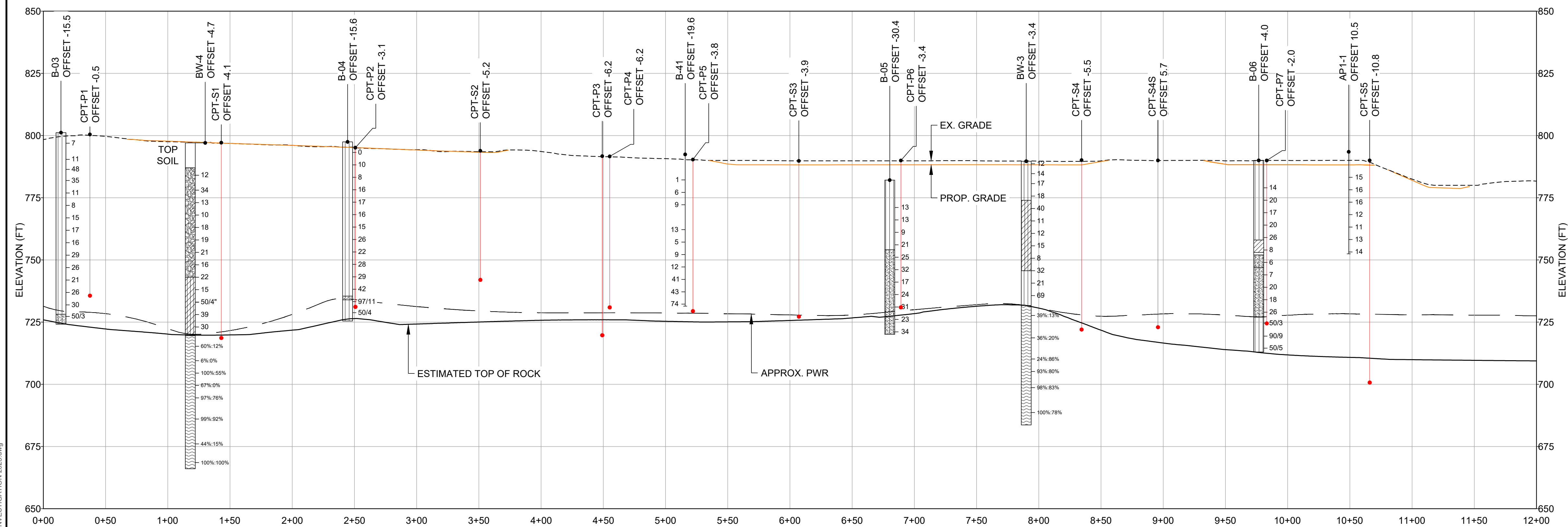
**APPENDIX A**

**Drawing Sheets**

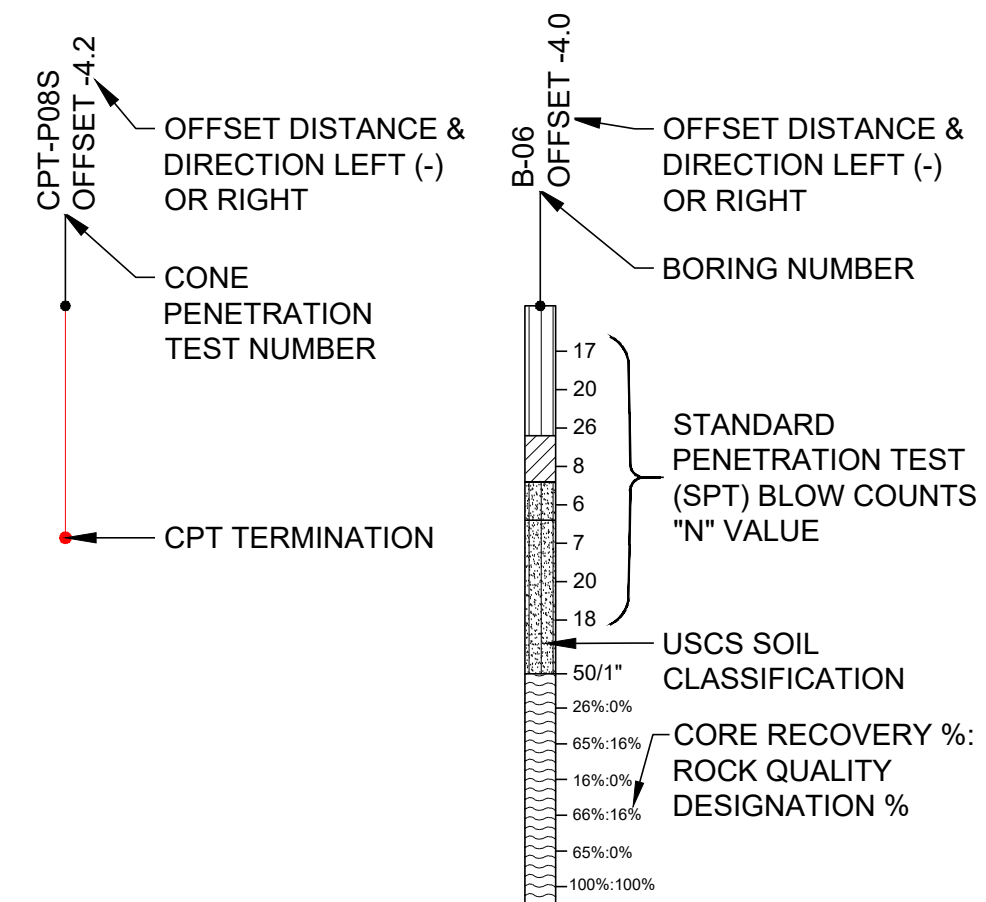
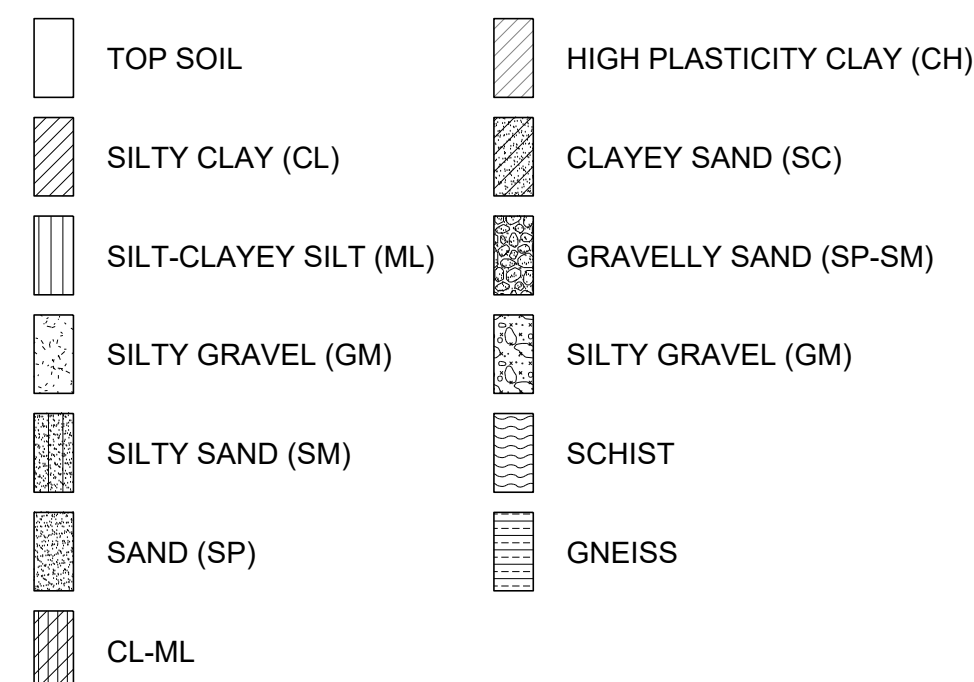








## LEGEND



## NOTES

1. PARTIALLY WEATHERED ROCK (PWR) IS DEFINED AS MATERIAL WITH A STANDARD PENETRATION TEST (SPT) N VALUE GREATER THAN 100. TOP OF ROCK (TOR) IS DEFINED AS THE DEPTH WHEN AUGER DRILLING REACHED REFUSAL WHERE APPLICABLE.

2. PWR AND TOR SURFACES ARE INTERPOLATED FROM AVAILABLE BORINGS.

3. THE ELEVATION OF THE UPPER SURFACE OF PWR AND TOR IS LIKELY TO VARY SIGNIFICANTLY OVER SHORT HORIZONTAL DISTANCES.

4. SPT "N" VALUE - BLOWS PER FOOT IN ACCORDANCE WITH ASTM D1586

FOR CONTINUATION SEE SHEET 3

CLIENT  
SOUTHERN COMPANY SERVICES



PROJECT  
PLANT MCDONOUGH - ATKINSON  
CCR UNIT AP-1  
BARRIER WALL DESIGN INVESTIGATION 2023



TITLE  
**BARRIER WALL DESIGN INVESTIGATION 2023**  
24+  
**PROFILE (1 OF 2)**

CONSULTANT



YYYY-MM-DD 2023-12-05

DESIGNED DAH

PREPARED	CRP
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CHECKED LS

REVIEWED / APPROVED GLH

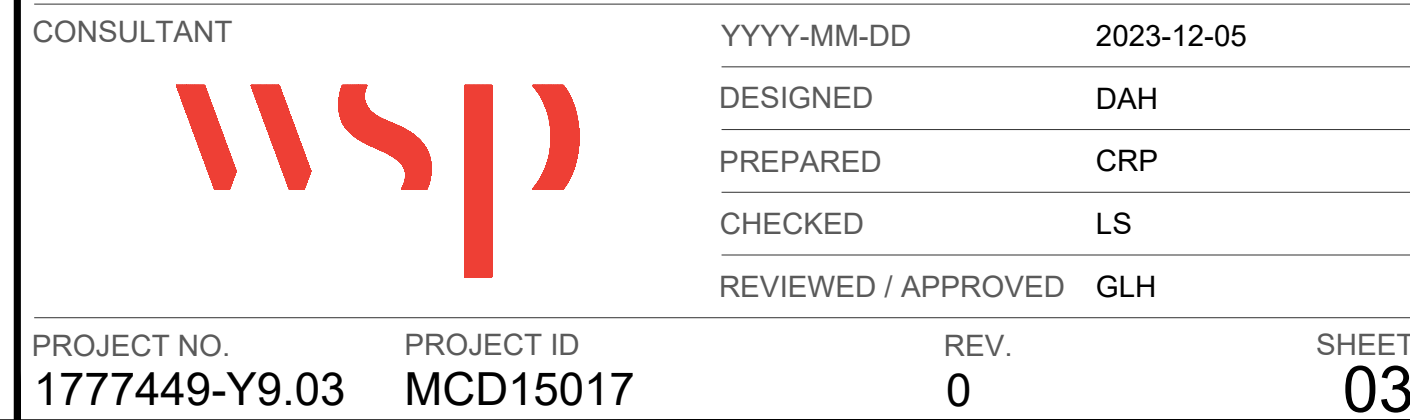
PROJECT NO.  
1777449-Y9.03

PROJECT ID  
MCD15017

REV.  
0

SHEET  
02







**APPENDIX B**

# Drillhole Logs



# RECORD OF BOREHOLE BW-1


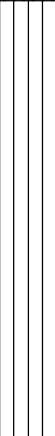
SHEET 1 of 1

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 45.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/8/23  
 DATE COMPLETED: 3/13/23

NORTHING: 1,391,134.51  
 EASTING: 2,200,836.22  
 GS ELEVATION: 789.91 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N			REC / ATT		
					DEPTH (ft)									
0		0.00 - 30.50 FILL: (CH-ML) Sandy clayey SILT and CLAY; red orange; cohesive, moderately plastic, w~PL, firm to hard.	CL-ML		759.41 30.50									
						1	SS	5 -4 -3 -4/24"	7	1.33 2.00				
5	785					2	SS	3 -4 -6 -6/24"	10	1.42 2.00				
10	780													
15	775													
20	770													
25	765													
30	760													
		30.50 - 45.00 (ML) Sandy, clayey SILT, fine to coarse schist gravel; tan brown; cohesive, w~PL, very stiff to hard.	ML		744.91	7	SS	7 -17 -16 -14/24"	33	1.75 2.00				
35	755													
40	750													
45	745													
		45.00: Auger refusal, assumed top of rock. PVC casing grouted in place. Rock core follow on. Boring completed at 45.00 ft												

AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDEN NJ-PA 05-24-06.GDT 5/9/23

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23





SHEET 2 of 3

ELEVATION: 789.91  
INCLINATION: -90  
200,836.2

[illegible]



SHEET 3 of 3

ELEVATION: 789.91  
INCLINATION: -90  
0,836.2

[illegible]



# RECORD OF BOREHOLE BW-2

SHEET 1 of 2

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 62.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/9/23  
 DATE COMPLETED: 3/23/23

NORTHING: 1,390,483.21  
 EASTING: 2,201,056.50  
 GS ELEVATION: 789.82 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
0		0.00 - 3.00 FILL: (CL) Sandy silty CLAY, micaceous; red mottled orange; cohesive, moderately plastic, w~PL, soft.	CL		786.82	1	SS	5 -4 -3 -4/24"	7	1.50 2.00		
5	785	3.00 - 35.80 FILL: (GW-GC) Sandy silty CLAY and muscovite GRAVEL, micaceous, trace red, high plasticity clay; light brown, tan; cohesive, moist, firm to soft.			3.00	2	SS	5 -5 -7 -8/24"	12	1.50 2.00		
10	780					3	SS	4 -7 -9 -13/24"	16	1.60 2.00		
15	775					4	SS	3 -3 -6 -7/24"	9	2.00 2.00		
20	770		GW-GC			5	SS	2 -2 -4 -6/24"	6	2.00 2.00		
25	765					6	SS	6 -9 -9 -12/24"	18	1.30 2.00		
30	760					7	SS	4 -6 -7 -8/24"	13	1.50 2.00		
35	755					8	SS	3 -1 -1 -1/24"	2	0.90 2.00		
40	750	35.80 - 46.00 (CL) SILTY CLAY, trace organics; brown, dark gray; cohesive, w~PL, soft to very soft.	CL		35.80	9	SS	WOH -3 -4 -6/24"	7	1.20 2.00		
45	745					10	SS	N/A/24"	WOH	1.80 2.00		
50	740	46.00 - 62.00 (CL) Sandy SILTY CLAY, fine sand; light gray, dark gray, white, tan, mottled; cohesive, w~PL, firm to hard.	CL		743.82 46.00	11	SS	5 -6 -9 -15/24"	15			

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23



AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDEN NJ-PA 05-24-06.GDT 5/9/23



# RECORD OF BOREHOLE BW-2


SHEET 2 of 2

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 62.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/9/23  
 DATE COMPLETED: 3/23/23

NORTHING: 1,390,483.21  
 EASTING: 2,201,056.50  
 GS ELEVATION: 789.82 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
50		46.00 - 62.00 (CL) Sandy SILTY CLAY, fine sand; light gray, dark gray, white, tan, mottled; cohesive, w~PL, firm to hard. (Continued)	CL			11	SS	5 -6 -9 -15/24"	15	1.80 2.00		
						12	SS	5 -7 -10 -14/24"	17	1.80 2.00		
55	735					13	SS	21 -48 -35 -36/24"	83	0.00 2.00		
60	730	62.00: Auger refusal, assumed top of rock. PVC casing grouted in place. Rock core follow on. Boring completed at 62.00 ft			727.82	14	SS	16 -27 -44 -50/3"/21"	71	1.30 2.00		
65	725											
70	720											
75	715											
80	710											
85	705											
90	700											
95	695											
100	690											

AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDR NJ-PA 05-24-06.GDT 5/9/23

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23





# RECORD OF DRILLHOLE BW-2

SHEET 2 of 3

PROJECT: Plant McDonough AP1-Drilling  
PROJECT NUMBER: GL1777449-Y9  
LOCATION: Smyrna, Georgia

DRILLING METHOD: Mud Rotary/HQ  
DRILLING DATE: 3/9/2023  
DRILL RIG: CME 550X

DATUM: NAD 83  
AZIMUTH: N/A  
COORDINATES: N: 1,390,483.2 E: 2,201,056.5

ELEVATION: 789.82  
INCLINATION: -90

DEPTH (feet)	ROCK TYPE		GRAPHIC LOG	ROCK TYPE										WEATHERING INDEX				ROCK STRENGTH INDEX		NOTES WATER LEVELS INSTRUMENTATION			
	DESCRIPTION	ELEV. DEPTH (ft)		RUN NO.	CORE RECOVERY	INTERVAL NO.	Jn	RQD %	FRACTURES PER FOOT	DISCONTINUITY DATA				GRAPHIC LOG	JCR	Jr	Ja	WEATHERING INDEX				STRENGTH TESTING (psi)	
										DEPTH (COUNT), TYPE, SHAPE, ROUGHNESS, INFILL CHARACTER, INFILL TYPE, INFILL THICKNESS (mm), AND DIP w/ CORE AXIS													
40																							
45																							
50																							
55																							
60																							
65	(62.0-70.0) Highly weathered (W4), foliated, (10YR 2/2) yellowish brown, fine to medium grained, non-porous to faintly porous, very weak (R1), Biotite Schist, [Button Schist]	727.8 62.0						24															
			1	2.1 8.0	1	4	0	24															
								24															
								24															
								24															
								4	(68.1) ( ) JN, IR, RO, SA, M Sa, < 2mm	20	3	2											
								9	(69.3) ( ) JN, IR, VR, CN, -, 35 (69.5) ( ) JN, IR, SM, SA, M Sa, < 2mm	25	3	1											
70	(70.0-75.0) Moderately weathered (W3), foliated, (10YR 2/2) yellowish brown, fine to medium grained, non-porous to faintly porous, medium strong (R3), Biotite Schist, [Button Schist] (71.8-72.0) Same as above, Extremely weak (R0)	719.8 70.0	2	1.3 1.3	2	6	0	3	(69.6) ( ) JN, IR, SM, SO, MnOx, -, 33 (69.8) ( ) JN, IR, VR, CC, M Sa, 5mm, 37 (70.3) ( ) JN, IR, RO, SO, MnOx, -, 46 (70.7) ( ) FOLO, IR, SM, SO, MnOx, -, 55 (70.9) ( ) JN, PL, RO, SO, MnOx, -, 41 (71.1) ( ) FOLO, IR, RO, SO, MnOx, -, 50 (71.2) ( ) JN, PL, RO, SO, MnOx, -, 10 (71.8) ( ) FOLO, IR, SM, SA, M Sa, < 2mm, 53 (72) ( ) FOLO, IR, RO, SA, M Sa, < 2mm	20	3	1											
								5		20	2	1											
								2		20	1.5	1											
			3	2.4 3.7	3	4	16	9	(72.2) ( ) FOLO, PL, SM, SO, FeOx, -, 64 (72.5) ( ) JN, PL, RO, SO, FeOx, -, 8 (72.7) ( ) JN, ST, RO, SA, M Sa, < 2mm, 28 (73.4) ( ) FOLO, IR, RO, SA, MnOx, -, 56	20	3	2											
								24															
								18	(76.4) ( ) FOLO, IR, RO, CN, -, 55 (76.6) ( ) FOLO, IR, RO, SO, MnOx, -, 61	22	3	1											
			4	3.3 5.0	4	4	16	0	(78) ( ) FOLO, IR, RO, SO, FeOx, -, 74 (78.4) ( ) FOLO, PL, RO, SO, FeOx, -, 61 (78.7) ( ) FOLO, PL, SM, PC, Chalco, -, 1mm, 52	22	3	1											
								10		20	1.5	1											
								4	(79.1) ( ) FOLO, IR, RO, SO, FeOx, -, 53 (79.5) ( ) JN, PL, RO, CN, -, 19	20	1.5	1											
80	Log continued on next page	709.8																					
SCALE: 1 in = 5 ft DRILLING CONTRACTOR: Premier Drilling DRILLER: L. Carter										LOGGED: RJF/CFM CHECKED: DLP REVIEWED: DAH				WEATHERING INDEX I-Fresh II-Slightly Weathered III-Moderately Weathered IV-Highly Weathered V-Completely Weathered IV-Residual Soil		UCS (psi) R1 - 150 R2 - 725 R3 - 3500 R4 - 7500 R5 - 15,000 R6 - 35,000		WSPI					

(70.0-75.0) Drilling from 10:20 to 10:29

(80.0-88.0) Drilling from 08:02 to 08:19



SHEET 3 of 3

ELEVATION: 789.82  
INCLINATION: -90  
201,056.5

[illegible]



# RECORD OF BOREHOLE BW-3

SHEET 1 of 2

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 58.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/16/23  
 DATE COMPLETED: 3/22/23

NORTHING: 1,390,653.98  
 EASTING: 2,201,675.12  
 GS ELEVATION: 789.67 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
0		0.00 - 15.70 FILL: (ML) CLAYEY SILT, some fine to coarse sand, some fine to coarse muscovite gravel; light brown to red orange; cohesive, w~PL, firm to stiff.	ML									
						1	SS	11 -6 -6 -7/24"	12	1.50 2.00		
5	785					2	SS	4 -6 -8 -9/24"	14	1.50 2.00		
10	780					3	SS	5 -6 -11 -12/24"	17	1.50 2.00		
15	775				773.97	4	SS	6 -7 -11 -13/24"	18	1.60 2.00		
		15.70 - 44.00 FILL: (CL-ML) Micaceous SILT and CLAY, some fine to coarse muscovite gravel; red, gray, brown; cohesive, w~PL, very soft to firm.	CL-ML		15.70							
20	770					5	SS	11 -19 -21 -22/24"	40	1.50 2.00		
25	765					6	SS	3 -6 -5 -7/24"	11	1.30 2.00		
30	760					7	SS	2 -3 -9 -6/24"	12	1.60 2.00		
35	755					8	SS	4 -5 -10 -13/24"	15	1.30 2.00		
40	750					9	SS	3 -3 -5 -10/24"	8	1.50 2.00		
45	745	44.00 - 58.00 (ML) Sandy SILT, fine sand, some fine to coarse muscovite gravel; gray tan, orange; cohesive, w~PL, stiff to hard.	ML		745.67 44.00	10	SS	13 -16 -16 -22/24"	32	1.60 2.00		
50	740	Log continued on next page				11	SS	6 -7 -14 -14/24"	21			

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23



AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDEN NJ-PA 05-24-06.GDT 5/9/23



# RECORD OF BOREHOLE BW-3

SHEET 2 of 2

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 58.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/16/23  
 DATE COMPLETED: 3/22/23

NORTHING: 1,390,653.98  
 EASTING: 2,201,675.12  
 GS ELEVATION: 789.67 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
50		44.00 - 58.00 (ML) Sandy SILT, fine sand, some fine to coarse muscovite gravel; gray tan, orange; cohesive, w~PL, stiff to hard. (Continued)	ML			11	SS	6 -7 -14 -14/24"	21	1.40 2.00		
55	735					12	SS	11 -26 -43 -38/24"	69	1.50 2.00		
		58.00: Auger refusal, assumed top of rock. PVC casing grouted in place. Rock core follow on. Boring completed at 58.00 ft			731.67							
60	730											
65	725											
70	720											
75	715											
80	710											
85	705											
90	700											
95	695											
100	690											

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23



AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDR NJ-PA 05-24-06.GDT 5/9/23



SHEET 1 of 2

COORDINATES: N: 1,390,654.0 E: 2,201,675.1

[illegible]



SHEET 2 of 2

ELEVATION: 789.67  
INCLINATION: -90  
1,675.1

[illegible]



# RECORD OF BOREHOLE BW-4

SHEET 1 of 2

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 77.50 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/17/23  
 DATE COMPLETED: 3/27/23

NORTHING: 1,391,306.59  
 EASTING: 2,201,755.32  
 GS ELEVATION: 797.05 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
0		0.00 - 10.00 FILL: Air knife for utility clearance (Topsoil)										
795												
5												
790												
10		10.00 - 54.00 FILL: (SP-SM) Micaceous fine SAND and SILT, some clay; gray, light orangish brown; cohesive, moist, firm to stiff.			787.05 10.00							
785						1	SS	4 -5 -7/18"	12	1.20 2.00		
15												
780												
20						2	SS	7 -13 -21 -28/24"	34	1.30 2.00		
775												
25						3	SS	4 -5 -8 -12/24"	13	1.30 2.00		
770												
30			SP-SM			4	SS	5 -5 -5 -7/24"	10	1.40 2.00		
765												
35						5	SS	6 -9 -9 -9/24"	18	1.60 2.00		
760												
40						6	SS	4 -8 -11 -14/24"	19	1.50 2.00		
755												
45						7	SS	6 -7 -14 -17/24"	21	1.60 2.00		
750												
50		Log continued on next page				8	SS	4 -6 -10 -12/24"	16			

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23





# RECORD OF BOREHOLE BW-4

SHEET 2 of 2

PROJECT: Plant McDonough AP1-Drilling  
PROJECT NUMBER: GL1777449-Y9  
DRILLED DEPTH: 77.50 ft

DRILL RIG: CME 550X  
DATE STARTED: 3/17/23  
DATE COMPLETED: 3/27/23

NORTHING: 1,391,306.59  
EASTING: 2,201,755.32  
GS ELEVATION: 797.05 ft  
TOC ELEVATION:

DEPTH W.L.:  
ELEVATION W.L.:  
DATE W.L.:  
TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
50		10.00 - 54.00 FILL: (SP-SM) Micaceous fine SAND and SILT, some clay; gray, light orangish brown; cohesive, moist, firm to stiff. (Continued)	SP-SM			8	SS	4 -6 -10 -12/24"	16	1.60 2.00		
745					743.05							
55		54.00 - 77.50 (CL-ML) CLAY and SILT, some fine to coarse muscovite gravel; brown to dark gray; cohesive, w-PL, stiff to hard.	CL-ML		54.00	9	SS	6 -9 -13 -17/24"	22	1.70 2.00		
740												
60						10	SS	4 -6 -9 -13/24"	15	2.00 2.00		
735												
65						11	SS	12 -21 -37 -50/4"/22"	58	1.60 2.00		
730												
70						12	SS	19 -19 -20 -24/24"	39	1.50 2.00		
725												
75						13	SS	18 -16 -14 -18/24"	30	1.00 2.00		
720					719.55							
80		77.50: Auger refusal, assumed top of rock. PVC casing grouted in place. Rock core follow on. Boring completed at 77.50 ft										
715												
85												
710												
90												
705												
95												
700												
100												

AA BOREHOLE RECORD MCDONOUGH SOIL GPJ GOLDR NJ-PA 05-24-06.GDT 5/9/23

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Premier Drilling  
DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
CHECKED BY: DAH  
DATE: 5/8/23





SHEET 1 of 3

ELEVATION: 797.05  
INCLINATION: -90  
1,755.3

[illegible]



# RECORD OF DRILLHOLE BW-4

SHEET 2 of 3

PROJECT: Plant McDonough AP1-Drilling  
PROJECT NUMBER: GL1777449-Y9  
LOCATION: Smyrna, Georgia

DRILLING METHOD: Mud Rotary/HQ  
DRILLING DATE: 3/17/2023  
DRILL RIG: CME 550X

DATUM: NAD 83  
AZIMUTH: N/A  
COORDINATES: N: 1,391,306.6 E: 2,201,755.3

ELEVATION: 797.05  
INCLINATION: -90

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IV-Highly Weathered  
V-Completely Weathered  
VI-Residual Soil

UCS (psi)  
R1 - 150  
R2 - 725  
R3 - 3500  
R4 - 7500  
R5 - 15,000  
R6 - 35,000





# RECORD OF DRILLHOLE BW-4

SHEET 3 of 3

PROJECT: Plant McDonough AP1-Drilling  
PROJECT NUMBER: GL1777449-Y9  
LOCATION: Smyrna, Georgia

DRILLING METHOD: Mud Rotary/HQ  
DRILLING DATE: 3/17/2023  
DRILL RIG: CME 550X

DATUM: NAD 83  
AZIMUTH: N/A  
COORDINATES: N: 1,391,306.6 E: 2,201,755.3

ELEVATION: 797.05  
INCLINATION: -90

DEPTH (feet)	ROCK TYPE		GRAPHIC LOG	ROCK TYPE										WEATHERING INDEX	ROCK STRENGTH INDEX	POINT LOAD ● Axial ■ Diametral ▲ UCS	NOTES WATER LEVELS INSTRUMENTATION			
	DESCRIPTION	ELEV. DEPTH (ft)		RUN NO.	CORE RECOVERY	INTERVAL NO.	Jn	RQD %	FRACTURES PER FOOT	DISCONTINUITY DATA			GRAPHIC LOG					JCR	Jr	Ja
										DEPTH (COUNT), TYPE, SHAPE, ROUGHNESS, INFILL CHARACTER, INFILL TYPE, INFILL THICKNESS (mm), AND DIP w/rt CORE AXIS										
120	(106.0-131.0) Fresh (W1), foliated, grayish blue green (SBG 5/2), fine grained, medium strong (R3), Muscovite Biotite Chlorite Garnet, Pyrite Schist [Button Schist] (Continued)		7	4.4 10.0	7	4	15	24												
125	(126.0-131.0) SAA [Button Schist]							24												
130			8	5.0 5.0	8	.5	100	0												
135	Downhole geophysics performed. Then grout to surface. END DRILLHOLE AT 131 ft. BGS.							0												
140																				
145																				
150																				
155																				
160																				

SCALE: 1 in = 5 ft  
DRILLING CONTRACTOR: Premier Drilling  
DRILLER: L. Carter

LOGGED: RJF/CFM  
CHECKED: DLP  
REVIEWED: DAH

WEATHERING INDEX  
I-Fresh  
II-Slightly Weathered  
III-Moderately Weathered  
IV-Highly Weathered  
V-Completely Weathered  
VI-Residual Soil

UCS (psi)  
R1 - 150  
R2 - 725  
R3 - 3500  
R4 - 7500  
R5 - 15,000  
R6 - 35,000





# RECORD OF BOREHOLE BW-5

SHEET 1 of 1

PROJECT: Plant McDonough AP1-Drilling  
 PROJECT NUMBER: GL1777449-Y9  
 DRILLED DEPTH: 25.00 ft

DRILL RIG: CME 550X  
 DATE STARTED: 3/6/23  
 DATE COMPLETED: 3/7/23

NORTHING: 1,391,737.84  
 EASTING: 2,200,988.01  
 GS ELEVATION: 779.66 ft  
 TOC ELEVATION:

DEPTH W.L.:  
 ELEVATION W.L.:  
 DATE W.L.:  
 TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC / ATT		
0		0.00 - 21.00 (SP-SM) Fine Sandy SILT; light brown, gray to tan orange; cohesive, moist, very stiff to hard.	SP-SM			1	SS	3 -3 -6 -7/24"	9	2.00 2.00		
5	775					2	SS	5 -20 -21 -23/24"	41	1.75 2.00		
10	770					3	SS	20 -32 -41 -50/5"/24"	73	2.00 2.00		
15	765					4	SS	7 -39 -50/4"/16"	50/4"	1.00 2.00		
20	760					5	SS	9 -21 -50/5"/17"	50/5"	1.50 2.00		
		21.00 - 25.00 (SP-SM) Silty fine SAND; dark gray, light brown; moist, very dense.	SP-SM		758.66 21.00							
25	755				754.66	6	SS	50/5"/5"	50/5"	0.42 0.42		
		25.00: Auger refusal, assumed top of rock. PVC casing grouted in place. Rock core follow on. Boring completed at 25.00 ft										
30	750											
35	745											
40	740											
45	735											
50	730											

AA BOREHOLE RECORD MCDONOUGH SOIL.GPJ GOLDR NJ-PA 05-24-06.GDT 5/9/23

LOG SCALE: 1 in = 6.5 ft  
 DRILLING COMPANY: Premier Drilling  
 DRILLER: Larry Carter

INSPECTOR: Connor Mikilitus  
 CHECKED BY: DAH  
 DATE: 5/8/23





SHEET 1 of 2

ELEVATION: 779.66  
INCLINATION: -90

[illegible]



# RECORD OF DRILLHOLE BW-5

SHEET 2 of 2

PROJECT: Plant McDonough AP1-Drilling  
PROJECT NUMBER: GL1777449-Y9  
LOCATION: Smyrna, Georgia

DRILLING METHOD: HSA/HQ  
DRILLING DATE: 3/6/2023  
DRILL RIG: CME 550X

DATUM: NAD 83  
AZIMUTH: N/A  
COORDINATES: N: 1,391,737.8 E: 2,200,988.0  
ELEVATION: 779.66  
INCLINATION: -90

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG	ROCK TYPE										WEATHERING INDEX				ROCK STRENGTH INDEX		POINT LOAD ● Axial ■ Diametral ▲ UCS	NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
			PL-Planar CU-Curved UN-Undulating ST-Stepped IR-Irregular		K-Slickensided PO-Polished SM-Smooth RO-Rough VR-Very Rough		BD-Bedding FLT-Fault BC-Broken Core FOLO-Foliation		VNO-Vein CONO-Contact (Open) CONC-Contact (Closed) -Clean SO-Staining only		SA-Slightly Altered CC-Completely Coated PC-Partially Coated IN-Infilled M-Silt		Br-Broken Rock Ca-Caliche CL-Clay Sa-Sand Mv-Not Applicable																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			ELEV.  DEPTH (ft)	RUN NO.	CORE RECOVERY  INTERVAL NO.	J <sub>n</sub>	RQD %	FRACTURES PER FOOT	DISCONTINUITY DATA				GRAPHIC LOGS	JCR	J <sub>1</sub>	J <sub>2</sub>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
									DEPTH (COUNT), TYPE, SHAPE, ROUGHNESS, INFL. CHARACTER, INFL. TYPE, INFL. THICKNESS (mm), AND DIP w/ CORE AXIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
40	(31.0-71.0) Slightly weathered (W2), foliated, dark gray (N3) to blue (5PB 3/2), fine to medium grained, medium strong (R3) to strong (R4), Muscovite Biotite Schist [Button Schist] (Continued)  (43.0-46.0) SAA, traces of pyrite and chlorite [Button Schist]		3	7.0 7.0	3	4	51	2	3	(36.7) (I) FOLO, IR, RO, SO, FeOx, - 58 (37.2) (I) FOLO, PL, SM, SO, FeOx, - 58 (37.7) (I) FOLO, IR, RO, SO, FeOx, - 58 (38.15) (I) FOLO, IR, RO, CN, - 58 (38.5) (I) FOLO, IR, RO, SO, FeOx, - 54 (38.6) (I) JN, IR, VR, SO, FeOx, - 21 (38.9) (I) JN, IR, RO, SO, FeOx, - 56 (40.6) (I) FOLO, PL, SM, CN, - 58 (40.7) (I) FOLO, IR, SM, CN, - 69 (40.8) (I) FOLO, IR, SM, SO, FeOx, - 59 (40.9) (I) FOLO, PL, RO, SO, FeOx, - 69 (41.1) (I) FOLO, IR, RO, CN, - 64 (41.2) (I) FOLO, IR, RO, CN, - 61 (42) (I) JN, IR, RO, PC, FeOx, - 1mm, 44 (42.1) (I) FOLO, IR, RO, CN, - 61 (42.2) (I) FOLO, IR, RO, CN, - 63 (42.3) (I) JN, IR, RO, SO, FeOx, - 48 (42.6) (I) FOLO, IR, RO, CN, - 64 (44.1) (I) FOLO, PL, RO, SO, FeOx, - 59 (44.6) (I) FOLO, PL, RO, SO, FeOx, - 59 (44.9) (I) FOLO, PL, RO, SO, FeOx, - 59 (45.4) (I) FOLO, PL, RO, SO, FeOx, - 71 (45.5) (I) FOLO, PL, RO, SO, FeOx, - 74 (45.6) (I) FOLO, UN, SM, PC, Musc, - 1mm, 71 (45.7) (I) FOLO, IR, RO, SO, FeOx, - 61 (45.8) (I) JN, IR, RO, PC, Musc, - 1mm, 81 (46.1) (I) FOLO, IR, SM, SO, FeOx, - 78 (46.15) (I) FOLO, IR, RO, SO, FeOx, - 78 (46.25) (I) FOLO, IR, RO, SO, FeOx, - 78 (46.5) (I) FOLO, IR, RO, SO, FeOx, - 69 (46.7) (I) FOLO, IR, RO, SO, FeOx, - 69 (46.8) (I) FOLO, IR, RO, SO, FeOx, - 61 (46.9) (I) JN, IR, VR, SO, FeOx, - 28 (47.1) (I) FOLO, IR, RO, SO, FeOx, - 63 (47.3) (I) FOLO, IR, RO, SO, FeOx, - 61 (47.4) (I) FOLO, PL, RO, CN, - 69 (47.5) (I) FOLO, IR, RO, CN, - 67 (47.6) (I) FOLO, IR, RO, CN, - 66 (47.9) (I) FOLO, PL, SM, CN, - 66 (48.1) (I) FOLO, IR, RO, CN, - 66 (48.3) (I) FOLO, IR, RO, CN, - 69 (48.4) (I) FOLO, PL, RO, PC, Sa, - 1mm, 61 (48.6) (I) FOLO, IR, RO, Infil, Musc, - 3mm, 59 (48.8) (I) BD, IR, RO, CN, - 67 (49) (I) FOLO, PL, RO, SO, FeOx, - 63 (49.1) (I) FOLO, IR, RO, PC, Sa, 1mm, 54 (49.2) (I) JN, IR, RO, PC, Sa, 1mm, 54 (49.3) (I) JN, IR, RO, PC, Sa, 1mm, 54 (49.4) (I) FOLO, IR, RO, SO, FeOx, - 74 (49.5) (I) FOLO, IR, RO, CN, - 73 (53) (I) JN, ST, RO, SO, FeOx, - 18 (53.2) (I) FOLO, IR, RO, SO, FeOx, - 51 (53.5) (I) FOLO, PL, RO, SO, FeOx, - 61 (53.6) (I) JN, IR, RO, SO, FeOx, - 15 (53.7) (I) FOLO, IR, RO, SO, FeOx, - 61 (53.9) (I) JN, UN, RO, SO, FeOx, - 16 (54.4) (I) FOLO, PL, RO, SO, FeOx, - 58 (54.7) (I) FOLO, PL, RO, SO, FeOx, - 57 (54.9) (I) FOLO, PL, RO, SO, FeOx, - 51 (55.3) (I) FOLO, PL, RO, SO, FeOx, - 59 (55.7) (I) FOLO, IR, SM, SO, FeOx, - 51 (55.9) (I) FOLO, IR, RO, SO, FeOx, - 54 (57) (I) FOLO, IR, RO, SO, FeOx, - 66 (57.4) (I) FOLO, IR, RO, SO, FeOx, - 61 (57.8) (I) FOLO, UN, RO, SO, FeOx, - 64 (58.5) (I) JN, IR, RO, SO, FeOx, - 43 (58.7) (I) JN, IR, RO, SO, FeOx, - 34 (58.9) (I) FOLO, IR, RO, SO, FeOx, - 54 (59.8) (I) JN, ST, RO, SO, FeOx, - 38 (60) (I) FOLO, IR, RO, PC, FeOx + Sa, 1mm, 62 (60.2) (I) FOLO, PL, SM, SO, FeOx, - 51 (60.4) (I) FOLO, PL, RO, SO, FeOx, - 52 (60.6) (I) JN, IR, RO, SO, FeOx, - 49 (60.7) (I) FOLO, CU, RO, SO, FeOx, - 67 (61.5) (I) FOLO, PL, RO, CC, Cl, - 1mm, 54 (61.7) (I) FOLO, IR, RO, SO, FeOx, - 73 (62) (I) FOLO, PL, RO, CC, MLL, - 1mm, 55 (64) (I) FOLO, PL, RO, CC, Sa, - 1mm, 53 (64.5) (I) FOLO, PL, RO, CN, - 52 (65.4) (I) FOLO, PL, RO, CN, - 53 (65.5) (I) FOLO, PL, RO, SO, FeOx, - 54 (65.6) (I) FOLO, PL, RO, SO, FeOx, - 53 (66.2) (I) FOLO, IR, RO, SO, FeOx, - 54 (66.3) (I) JN, IR, RO, SO, FeOx, - 3 (66.4) (I) FOLO, IR, RO, SO, FeOx, - 52 (66.5) (I) FOLO, PL, RO, SO, FeOx, - 54 (67.1) (I) FOLO, IR, RO, SO, FeOx, - 51 (67.3) (I) FOLO, IR, RO, CN, - 64 (67.4) (I) FOLO, IE, RO, CN, - 61 (67.6) (I) JN, PL, RO, SO, FeOx, - 15 (67.7) (I) FOLO, IR, RO, SO, FeOx, - 69 (68.2) (I) FOLO, IR, RO, SO, FeOx, - 63 (70.7) (I) FOLO, IR, RO, SO, FeOx, - 63 (71.2) (I) FOLO, IR, RO, SO, FeOx, - 51	20	2	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

SCALE: 1 in = 5 ft  
DRILLING CONTRACTOR: Premier Drilling  
DRILLER: L. Carter

LOGGED: RJF/CFM  
CHECKED: DLP  
REVIEWED: DAH

WEATHERING INDEX  
I-Fresh  
II-Slightly Weathered  
III-Moderately Weathered  
IV-Highly Weathered  
V-Completely Weathered  
VI-Residual Soil

UCS (psi)  
R1 - 150  
R2 - 725  
R3 - 3500  
R4 - 7500  
R5 - 15,000  
R6 - 35,000





## APPENDIX C

# Photologs



## Borehole BW-1

### PHOTO 1:

Split Spoon 1:  
(1.0' to 3.0')



### PHOTO 2:

Split Spoon 2:  
(4.5' to 6.5')

Photo Not Available



## Borehole BW-1

### PHOTO 3:

Split Spoon 3:  
(9.5' to 11.5')

Photo Not Available

### PHOTO 4:

Split Spoon 4:  
(14.5' to 16.5')





## Borehole BW-1

### PHOTO 5:

Split Spoon 5:  
(19.5' to 21.5')



### PHOTO 6:

Split Spoon 6:  
(24.5' to 26.5')





## Borehole BW-1

### PHOTO 7:

Split Spoon 7:  
(29.5' to 31.5')



### PHOTO 8:

Split Spoon 8:  
(34.5' to 36.5')





## Borehole BW-1

### PHOTO 9:

Split Spoon 9:  
(39.5' to 41.5')



### PHOTO 10:

Split Spoon 10:  
(44.5' to 46.5')





## Borehole BW-1

### PHOTO 11:

Core Box 1:  
(45.0' to 73.15')



### PHOTO 12:

Core Box 2:  
(73.15' to 83.4')





## Borehole BW-1

### PHOTO 13:

Core Box 3:  
(83.4' to 93.0')





## Borehole BW-2

### PHOTO 1:

Split Spoon 1:  
(1.0' to 3.0')

Photo Not Available

### PHOTO 2:

Split Spoon 2:  
(4.0' to 6.0')





## Borehole BW-2

### PHOTO 3:

Split Spoon 3:  
(9.0' to 11.0')



### PHOTO 4:

Split Spoon 4:  
(14.0' to 16.0')





## Borehole BW-2

### PHOTO 5:

Split Spoon 5:  
(19.0' to 21.0')



### PHOTO 6:

Split Spoon 6:  
(24.0' to 26.0')





## Borehole BW-2

### PHOTO 7:

Split Spoon 7:  
(29.0' to 31.0')



### PHOTO 8:

Split Spoon 8:  
(34.0' to 36.0')





## Borehole BW-2

### PHOTO 9:

Split Spoon 9:  
(39.0' to 41.0')



### PHOTO 10:

Split Spoon 10:  
(44.0' to 46.0')





## Borehole BW-2



### PHOTO 11:

Split Spoon 11  
(49.0' to 51.0')

### PHOTO 12:

Split Spoon 12:  
(51.0' to 53.0')

Photo Not Available



## Borehole BW-2

### PHOTO 13:

Split Spoon 13:  
(54.0' to 56.0')



### PHOTO 14:

Split Spoon 14:  
(59.0' to 61.0')





## Borehole BW-2

### PHOTO 15:

Core Box 1:  
(62.0' to 80.3')



### PHOTO 16:

Core Box 2:  
(80.3' to 97.4')





## Borehole BW-2

### PHOTO 17:

Core Box 3:  
(97.4' to 107.7')



### PHOTO 18:

Core Box 4:  
(107.7' to 110.0')





## Borehole BW-3

### PHOTO 1:

Split Spoon 1:  
(1.0' to 3.0')



### PHOTO 2:

Split Spoon 2:  
(4.0' to 6.0')





## Borehole BW-3

### PHOTO 3:

Split Spoon 3:  
(9.0' to 11.0')



### PHOTO 4:

Split Spoon 4:  
(14.0' to 16.0')





## Borehole BW-3

### PHOTO 5:

Split Spoon 5:  
(19.0' to 21.0')



### PHOTO 6:

Split Spoon 6:  
(24.0' to 26.0')





## Borehole BW-3

### PHOTO 7:

Split Spoon 7:  
(29.0' to 31.0')

Photo Not Available

### PHOTO 8:

Split Spoon 8:  
(34.0' to 36.0')





## Borehole BW-3

### PHOTO 9:

Split Spoon 9:  
(39.0' to 41.0')

Photo Not Available

### PHOTO 10:

Split Spoon 10:  
(44.0' to 46.0')





## Borehole BW-3

### PHOTO 11:

Split Spoon 11  
(49.0' to 51.0')



### PHOTO 12:

Split Spoon 12:  
(54.0' to 56.0')





## Borehole BW-3

### PHOTO 13:

Core Box 1:  
(58.0' to 83.0')



### PHOTO 14:

Core Box 2:  
(83.0' to 92.0')





## Borehole BW-3

### PHOTO 15:

Core Box 3:  
(92.0' to 101.7')



### PHOTO 16:

Core Box 4:  
(101.7' to 106.0')





## Borehole BW-4

### PHOTO 1:

Split Spoon 1:  
(13.0' to 15.0')

Photo Not Available

### PHOTO 2:

Split Spoon 2:  
(19.0' to 21.0')





## Borehole BW-4

### PHOTO 3:

Split Spoon 3:  
(24.0' to 26.0')



### PHOTO 4:

Split Spoon 4:  
(29.0' to 31.0')





## Borehole BW-4

### PHOTO 5:

Split Spoon 5:  
(34.0' to 36.0')



### PHOTO 6:

Split Spoon 6:  
(39.0' to 41.0')





## Borehole BW-4

### PHOTO 7:

Split Spoon 7:  
(44.0' to 46.0')



### PHOTO 8:

Split Spoon 8:  
(49.0' to 51.0')





## Borehole BW-4

### PHOTO 9:

Split Spoon 9:  
(54.0' to 56.0')



### PHOTO 10:

Split Spoon 10  
(59.0' to 61.0')





## Borehole BW-4

### PHOTO 11:

Split Spoon 11:  
(64.0' to 66.0')



### PHOTO 12:

Split Spoon 12:  
(69.0' to 71.0')

Photo Not Available



## Borehole BW-4

**PHOTO 13:**

Split Spoon 13:  
(74.0' to 76.0')



**PHOTO 14:**

Core Box 1:  
(77.5' to 93.5')





## Borehole BW-4

### PHOTO 15:

Core Box 2:  
(93.5' to 103.8')



### PHOTO 16:

Core Box 3:  
(103.8' to 113.1')





## Borehole BW-4

**PHOTO 17:**

Core Box 4:  
(113.1' to 127.7')



**PHOTO 18:**

Core Box 5:  
(127.7' to 131.0')





## Borehole BW-5

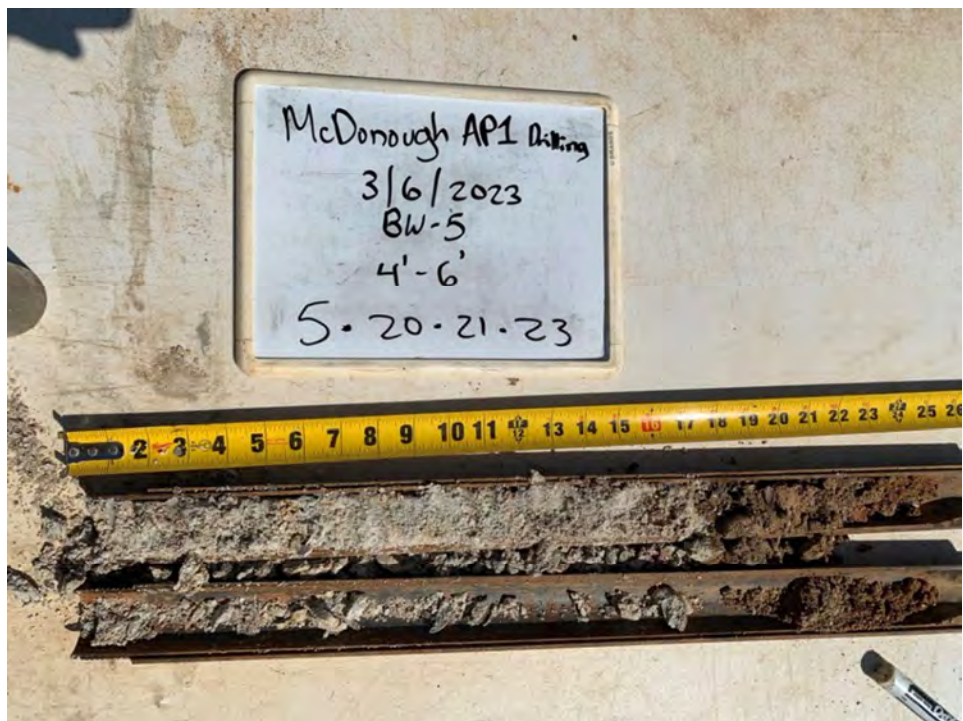
### PHOTO 1:

Split Spoon 1:  
(0.0' to 2.0')



### PHOTO 2:

Split Spoon 2:  
(4.0' to 6.0')





## Borehole BW-5

### PHOTO 3:

Split Spoon 3:  
(9.0' to 11.0')



### PHOTO 4:

Split Spoon 4:  
(14.0' to 16.0')





## Borehole BW-5

### PHOTO 5:

Split Spoon 5:  
(19.0' to 21.0')



### PHOTO 6:

Split Spoon 6:  
(24.0' to 26.0')





## Borehole BW-5

### PHOTO 7:

Core Box 1:  
(25.0' to 34.5')



### PHOTO 8:

Core Box 2:  
(34.5' to 45.5')





## Borehole BW-5

### PHOTO 9:

Core Box 3:  
(45.5' to 58.1')



### PHOTO 10:

Core Box 4:  
(58.1' to 67.1')





## Borehole BW-5

### PHOTO 11:

Core Box 5:  
(67.1' to 71.0')





## **APPENDIX D**

# Geotechnical Laboratory Results



**SCS/STATE CCR PERMITTING SER. Y9/GA**  
**SUMMARY OF POINT LOAD TESTING**  
**ASTM D5731**

SAMPLE IDENTIFICATION	TEST TYPE <sup>1</sup>	D PLATEN SEPARATION (in)	W Diameter (in)	D <sub>e</sub> <sup>2</sup> (in <sup>2</sup> )	P FORCE AT FAILURE (lbf)	I <sub>s</sub> POINT LOAD STRENGTH INDEX <sup>2</sup> (psi)	I <sub>s(50)</sub> (psi)	UCS BASED ON CORRELATION WITH POINT LOAD INDEX (psi)	Valid Test (Yes/No)	COMMENTS
BW-1, S-1, 45.2'	-	-	-	-	-	-	-	-	-	Not Testable
BW-1, S-2, 46'	A	0.94	2.40	2.89	2287.5	791.7	741.1	19,398	Yes	
BW-2, S-3, 69.5'	A	1.85	2.38	5.61	645.6	115.1	125.0	2,819	Yes	
BW-2, S-4, 70.5'	D	2.38	-	5.67	620.0	109.3	119.1	2,677	Yes	
BW-2, S-4, 70.5'	A	1.93	2.38	5.85	876.5	149.8	164.4	3,671	No	Broke on existing fracture, not thru points
BW-2, S-5, 72'	A	1.81	2.38	5.49	1026.2	186.8	202.1	4,578	No	Did not break thru points
BW-2, S-6, 77.3 - 78'	D	2.38	0.00	5.67	1359.7	239.7	261.1	5,872	Yes	
BW-2, S-6, 77.3 - 78'	A	-	-	-	-	-	-	-	-	Could not obtain specimen due to existing fractures
BW-3, S-7 59.4'	D	2.36	-	5.58	102.6	18.4	20.0	451	Yes	
BW-3, S-7, 59.4'	A	1.02	2.36	3.08	555.9	180.5	171.4	4,423	Yes	
BW-3, S-8, 60.3'	A	1.10	2.32	3.26	320.7	98.4	94.6	2,410	Yes	
BW-3, S-9, 66.7'	A	1.93	2.32	5.71	51.3	9.0	9.8	220	Yes	
BW-3, S-10, 67'	D	2.32	-	5.40	98.3	18.2	19.6	447	Yes	
BW-3, S-10, 67'	A	2.20	2.32	6.52	252.3	38.7	43.5	948	No	Did not break thru points
BW-3, S-11, 68.9'	A	1.22	2.36	3.67	303.6	82.7	81.7	2,026	Yes	
BW-4, S-12, 78'	D	2.38	-	5.67	265.1	46.7	50.9	1,145	Yes	
BW-4, S-12, 78'	A	1.50	2.38	4.54	1329.8	293.1	303.7	7,181	Yes	
BW-4, S-13, 79.5'	D	2.38	-	5.67	868.0	153.0	166.7	3,748	Yes	
BW-4, S-13, 79.5'	A	1.26	2.38	3.82	3587.4	938.9	935.9	23,004	Yes	
BW-4, S-14, 89.2'	D	2.38	-	5.67	286.5	50.5	55.0	1,237	Yes	
BW-4, S-14, 89.2'	A	1.83	2.38	5.55	3035.8	546.8	592.9	13,396	No	Did not break thru points
BW-4, S-14, 89.2'	A	1.22	2.38	3.70	2958.8	799.4	791.2	19,585	Yes	
BW-5, S-16, 25.3'	A	1.97	2.38	5.97	1778.7	297.9	328.4	7,300	Yes	
BW-5, S-17, 25.7'	D	2.38	-	5.67	675.6	119.1	129.7	2,917	Yes	
BW-5, D-17, 25.7'	A	1.12	2.38	3.40	1453.8	427.2	414.9	10,467	Yes	

**Notes:**

1. D = Diametral / A = Axial.

2. I<sub>s</sub> = Point Load Strength Index =  $P/D_e^2$ 

Tech	DA
Date	5/6/23
Check	<i>DA</i>
Review	<i>[Signature]</i>
Approve	



GL1777449-Y9

[illegible][illegible]

**WSP USA**



# UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMENS

ASTM D7012 - Method C

PROJECT NAME	SCS/STATE CCR PERMITTING SER. Y-9/GA
PROJECT NUMBER	GL1777449-Y9
SAMPLE ID	BW-4, S-15
SAMPLE DEPTH	89.8 - 90.7'

Length (in)	4.985
	5.015
	5.035
	4.960

Average

4.999

Load at Failure (lbs)

26,690

Diameter (in)	2.376
	2.377
	2.378
	2.377

Average

2.377

Uniaxial Compressive Strength (psi)

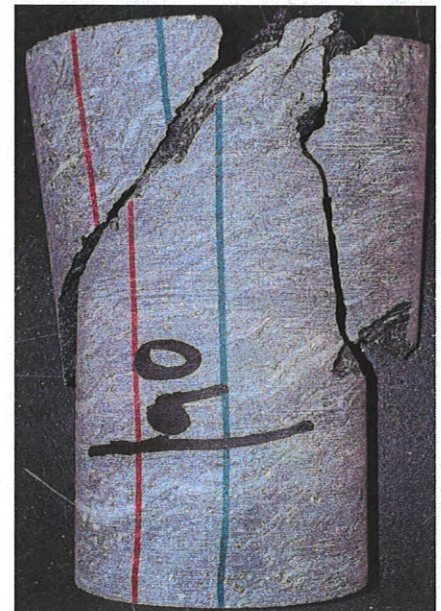
6,015

Weight (g)	1015.76
------------	---------

L/D Ratio

2.103

Photo of Break



Moisture Content

Wet Weight + Tare (g)	1004.96
Dry Weight + Tare (g)	1004.05
Tare Weight (g)	8.33
Weight of Water (g)	0.91
Dry Weight (g)	995.72
Moisture Content (%)	0.1

Area (in<sup>2</sup>)

4.438

Volume (in<sup>3</sup>)

22.182

Dry Density (pcf)

174.3

Remarks

Description

USCS

Tech	DA
Date	5/11/23
Check	DA
Review	
Approve	



# UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMENS

ASTM D7012 - Method C

PROJECT NAME	SCS/STATE CCR PERMITTING SER. Y-9/GA
PROJECT NUMBER	GL1777449-Y9
SAMPLE ID	BW-5, S-18
SAMPLE DEPTH	27.2 - 28.0'

Length (in)	4.731
	4.726
	4.787
	4.796

Average

4.760

Load at Failure (lbs)

57,440

Diameter (in)	2.394
	2.393
	2.392
	2.387

Average

2.392

Uniaxial Compressive Strength (psi)

12,787

Weight (g)	911.01
------------	--------

L/D Ratio

1.990

Photo of Break



Moisture Content

Wet Weight + Tare (g)	881.83
Dry Weight + Tare (g)	880.98
Tare Weight (g)	7.99
Weight of Water (g)	0.85
Dry Weight (g)	872.99
Moisture Content (%)	0.1

Area (in<sup>2</sup>)

4.492

Volume (in<sup>3</sup>)

21.381

Dry Density (pcf)

162.2

Remarks

Description

USCS

Tech	DA
Date	5/11/23
Check	DA
Review	
Approve	



**APPENDIX E**

# Geophysical Investigation Technical Memorandum





## TECHNICAL MEMORANDUM

**DATE** 05-09-2023

**Project No.** GL1777449-Y9

**TO** Georgia Power

**CC** Robert K. Davis

**FROM** Chris Bryant

**EMAIL** kim.davis@wsp.com

### PLANT MCDONOUGH - 2022 PERMITTING SUPPORT AP-1 INVESTIGATION 22-23 BOREHOLE GEOPHYSICS

## 1.0 INTRODUCTION

This technical memorandum documents the downhole borehole geophysics completed by WSP's geophysical team in bedrock boreholes from March 20 to April 11, 2023 around Ash Pond 1 (AP-1) at Plant McDonough (Site), in Cobb County, Georgia

The downhole geophysics logging was part of an exploratory investigation that included HQ-diameter rotary coring to a depth of around 45 feet into bedrock to a total depth of 93 to 131 ft BGS. Packer testing was conducted in the holes.

Of the five boreholes drilled, downhole geophysics was performed on four boreholes (BW-1 through BW-4). The boreholes were located along the elevated service road surrounding AP-1. Downhole borehole geophysics was not completed in BW-5.

Each borehole had PVC casing temporarily installed to top of rock. The bedrock was HQ cored, and the overburden was either drilled using hollow stem auger or mud rotary methodologies.

## 2.0 SUMMARY OF WORK

The borehole geophysics was to support identification of lithologic contacts and flow zones. The geophysical logs included:

- Fluid temperature and conductivity (FTC) log (Mount Sopris Instruments, MSI model QL40-FTC) to evaluate borehole water quality characteristics and to identify bedrock flow zones.
- 3-arm summation caliper log (Mount Sopris Instruments, MSI, model QL40-CAL) to identify depth of casing bottom, potential casing defects, borehole accessibility, bedrock fractures, and borehole diameter variations/lithology.
- Natural gamma and single point resistance (SPR) logs (MSI model 40LGR-1000) to characterize lithologic changes, flow zones, and water quality.
- Static heat pulse flowmeter (HPFM) testing (MSI model HPFM-2293) to measure vertical flow at given depths within each borehole under static conditions to identify water flow zones up to 1.5 gallon per minute (gpm).



Stressed heat pulse flowmeter (HPFM) testing (MSI model HPFM-2293) was done by injecting water into the borehole.

### 3.0 BOREHOLE GEOPHYSICAL METHODS

WSP used a portable borehole geophysical logging system and tools manufactured by Mount Sopris Instrument Company (MSI). The logging acquisition software was MSI/ALT's LoggerSuite-13.2.2790.

#### 3.1 Fluid Temperature and Fluid Conductivity (FTC)

A MSI model QL40-FTC combination fluid temperature and conductivity probe (SN 5518) was used for to record the fluid temperature log and fluid conductivity log of the fluid filling the borehole. This probe was run uncentralized, logged traveling down the borehole at 6 ft/min with a depth sample interval of 0.05 ft.

Fluid temperature logs are useful for delineating water-bearing zones and fluid flow into or out of the borehole by abrupt shifts in values or by slight changes in slope compared to the regional geothermal gradient, which is approximately 1-degree Fahrenheit per 100 feet of depth. Fluid conductivity is directly proportional to the concentration of dissolved solids in the borehole fluid and can also be used to delineate fluid flow into or out of the borehole as well as a general indicator of water quality in the borehole. These measurements apply to the fluid (water) in the borehole and may not be the same as the temperature and resistivity of the rocks surrounding the borehole.

#### 3.2 Caliper

A MSI model QL40-CAL (SN 5521) 3-arm summation caliper probe was used to record the caliper log run uncentralized (except for the angled borehole in which the tool was centralized), traveling up the borehole at 10 to 12 ft/min with a depth sample interval of 0.05 ft. This log is calibrated at the start of each run using an MSI calibration jig.

This measurement gives the borehole diameter as indicated by the average deflection of three spring-loaded arms pressed against the wall of the borehole. Abrupt shifts to larger diameter (kicks) can indicate the locations where fractures intersect the borehole wall. However, the thickness of the caliper arms and the mechanical enlargement of fractures by drilling result in only a very approximate, qualitative relation between fracture aperture and the size of the caliper deflection (Long et al, 1996). Changes in borehole diameter indicated by the caliper log are also useful in interpreting other geophysical logs since changes in borehole diameter can affect interpretations of flowmeter, formation resistivity logs, and borehole imaging logs such as televiewers.

#### 3.3 Natural Gamma and Single-Point Resistance (SPR)

WSP used a MSI 40LGR-1000 (SN 5809) combination natural gamma (gamma) and single-point resistance (SPR) probe run uncentralized traveling up the borehole at 10 to 12 ft/min with a depth sample interval of 0.05 ft. The SPR was run traveling down the borehole at 10 to 12 ft/min with a depth sample interval of 0.05 ft.

The gamma log is sometimes referred to as gamma, gamma ray and total count gamma. The gamma sensor is a Sodium Iodine crystal that emits a pulse of light when struck by a gamma photon. The primary sources of naturally occurring radiation in the geologic environment are the isotopes of the daughter products of the most abundant radionuclides such as 40K, the uranium-radium series and the thorium series. The decay of these isotopes produces alpha and beta particles, and gamma rays. The gamma rays are emitted at discrete energy levels. The gamma tool measures only the total gamma ray energy. This measurement gives the average



natural gamma activity of the formation adjacent to the borehole, and can be related to variations in lithology, and occasionally to degree of weathering in cases where alteration results in the local deposition of radioisotopes along fracture planes.

The SPR log measures the electrical resistance in ohms between an electrode in the borehole and an electrode at surface (the mud plug). The resistance of the intervening earth material is a function of composition, cross-sectional area and length of the travel path. However, as there is no way to measure the length or cross-sectional area of the travel path, the measurement is relative, and the logs cannot be related quantitatively to formation resistivity. SPR logs deflect according to the changes in bed resistivity adjacent to the borehole electrode, with positive deflections indicating an increase in resistivity. The response is independent of bed thickness, resulting in a high vertical resolution of contacts between materials of differing resistivity. In sedimentary rock, the primary use is for accurately identifying lithologic contacts. Local changes in resistivity can be related to lithology, and local reductions in resistance can be caused by clay mineral alteration adjacent to fractures.

### **3.4 Heat Pulse Flowmeter (HPFM)**

WSP used a MSI model HFP-2293 heat pulse flowmeter (SN 5517) to measure small vertical flow components at given depths in the borehole. This measurement gives the vertical flow at a given depth in the borehole where the probe is held stationary long enough for all effects of probe movement on the fluid column to have faded. The measurement gives the time required for vertical flow to move a thermally tagged parcel of water a known distance (2 cm) up or down after heating by capacitor discharge onto an electrical grid. The probe measures flow through a cylindrical measurement section where the annulus surrounding this cylinder is blocked by a flexible disk, the diverter.

Flowmeter response times were converted to flow rates using calibration curves provided by MSI. Upward flow is detected by the upper thermistor and reported as a positive value, while downward flow is detected by the lower thermistor and reported as a negative value. The heat-pulse flowmeter has a low flow detection limit of about 0.01 gpm (Hess, 1986). The upper flow detection limit is associated with the thermal inertia of the thermistors, which cannot respond quickly enough to detect flow if the flow exceeds about 1.5 gpm in either direction (up or down).

The HPFM testing was only possible in boring BW-4 because of equipment malfunction.

## **4.0 BOREHOLE GEOPHYSICAL LOGGING RESULTS**

ALT's WellCAD v5.6 software was used to process the geophysical log data. All logs are depth referenced to ground surface. Log plots for each borehole are included in Appendix A.

### **4.1 Borehole BW-1**

The FTC logs indicate flow from the base of the casing and a fracture at 52 ft depth; which coincided with loss of drill fluid. There was no core recovered from BW-1 from around 48 ft to 67 ft.

### **4.2 Borehole BW-2**

The gamma, SPR, and caliper show a change at 88.5 ft depth (~701 ft elevation) and a possible flow zone. This coincides with the base of a highly fractured zone.



Below the flow zone at 88.5 this depth is more resistive, higher gamma counts and harder. This generally coincides with a rock demonstrating less fracturing, less weathering and increased RQDs.

### 4.3 Borehole BW-3

The FTC logs indicate flow from the base of the casing, at a fracture at 65.3 ft depth (~724 ft elevation), which coincides with approximate the top of rock. Flow is also indicated in at a fracture at 70.5 ft depth (~719 ft elevation). This coincides with a highly fractured (>2 fractures per inch) recorded in the borehole log. The gamma, SPR, and caliper show a change 82 ft depth (~707 ft elevation) The formation below this depth is more resistive, higher gamma counts and harder. This is logged as a decrease in weathering and increase in rock strength and core recovery. The FTC logs indicate possible flow at this depth.

### 4.4 Borehole BW-4

The FTC logs indicate possible flow from the base of the casing, generally coinciding with the top of rock. The gamma, SPR, and caliper show a change 99.5 ft depth (~697 ft elevation) where the formation below becomes more resistive, higher gamma counts and harder. This coincides with an increase in the RQD and rock strength and a decrease in weathering.

## 5.0 SURVEY LIMITATIONS

WSP's geophysical services are conducted in a manner consistent with the level of care and skill ordinarily exercised by other members of the technical community currently practicing under similar conditions subject to the time limits, financial, and physical constraints applicable to the services.

## 6.0 REFERENCES

Hess, A.E., 1986, Identifying hydraulically conductive fractures with a slow-velocity borehole flowmeter, Canadian Geotechnical Journal, v. 23, p. 69-78.

Long, J.C.S., and others, 1996. Rock fractures and fluid flow--Contemporary understanding and applications, Washington, D.C.: National Academy Press, 551 p.

WSP USA INC.



Chris Bryant  
*Senior Geophysicist, PG, RPG*



Robert K. Davis  
*Technical Principal, Senior Geophysical Consultant, PG*

CAB/RKD/cab

Appendixes: Appendix A, Geophysical Logs



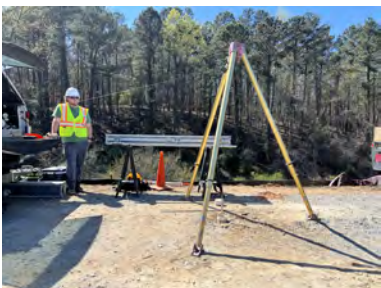
**APPENDIX A**

# Geophysical Logs



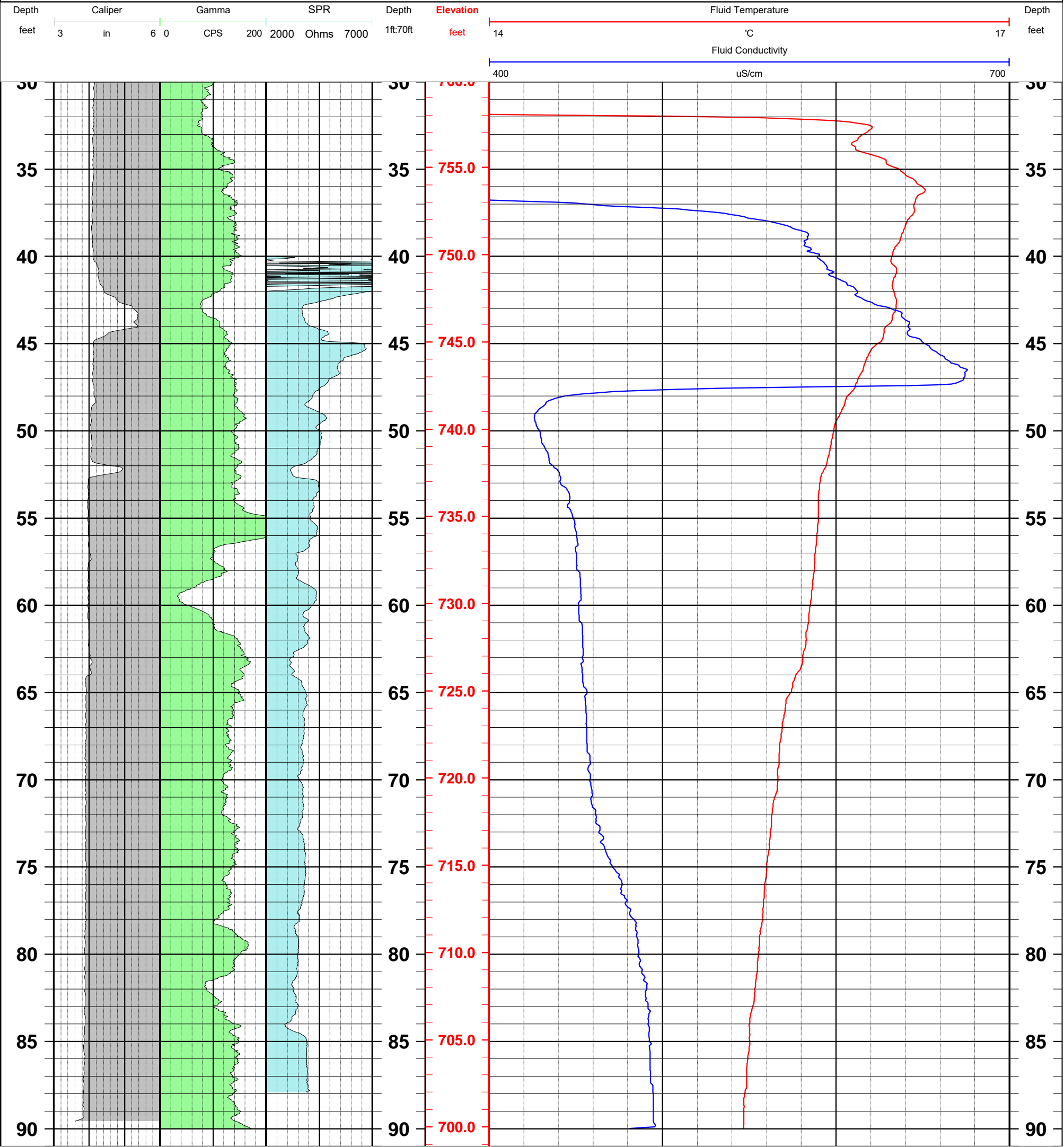
Geophysical Record of Borehole: BW-1

Project Title: Plant McDonough Permitting Support AP-1 Investigation  
Project Number: GL1777449-Y9  
Client: Georgia Power  
Date: April 11, 2023



Driller: Premier	Casing Dia.: 4 in	Log Depth Ref.: Ground Surface	Location: Plant McDonough AP-1
Drilled Depth: 93 ft	Casing Material: PVC	Water Level: see notes	
Drill Date: March 10, 2023	Casing Depth: 42 ft bgs	Borehole Incl.: vertical	Log Date: 3-20-2023 and 4-11-2023
Drill Method.: Mud rotary & HQ core	Casing Stick-up: see notes	Borehole Az.: na	Logged By: Chris Bryant and Geoff Busby
GS Elevation: 789.9 (feet NAVD 88)	Easting: 2200836.2	Northing: 1391134.5	Coord. Sys.: GA ST Plane West (ft NAD83)

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing. The casing stick-up on 3-20-23 was 0.25 ft ags and was below GS on 4-11-2023. Water levels were 32.05' BTC on 3-20-23 and 31.47' BGS 7:22 on 4-11-23.





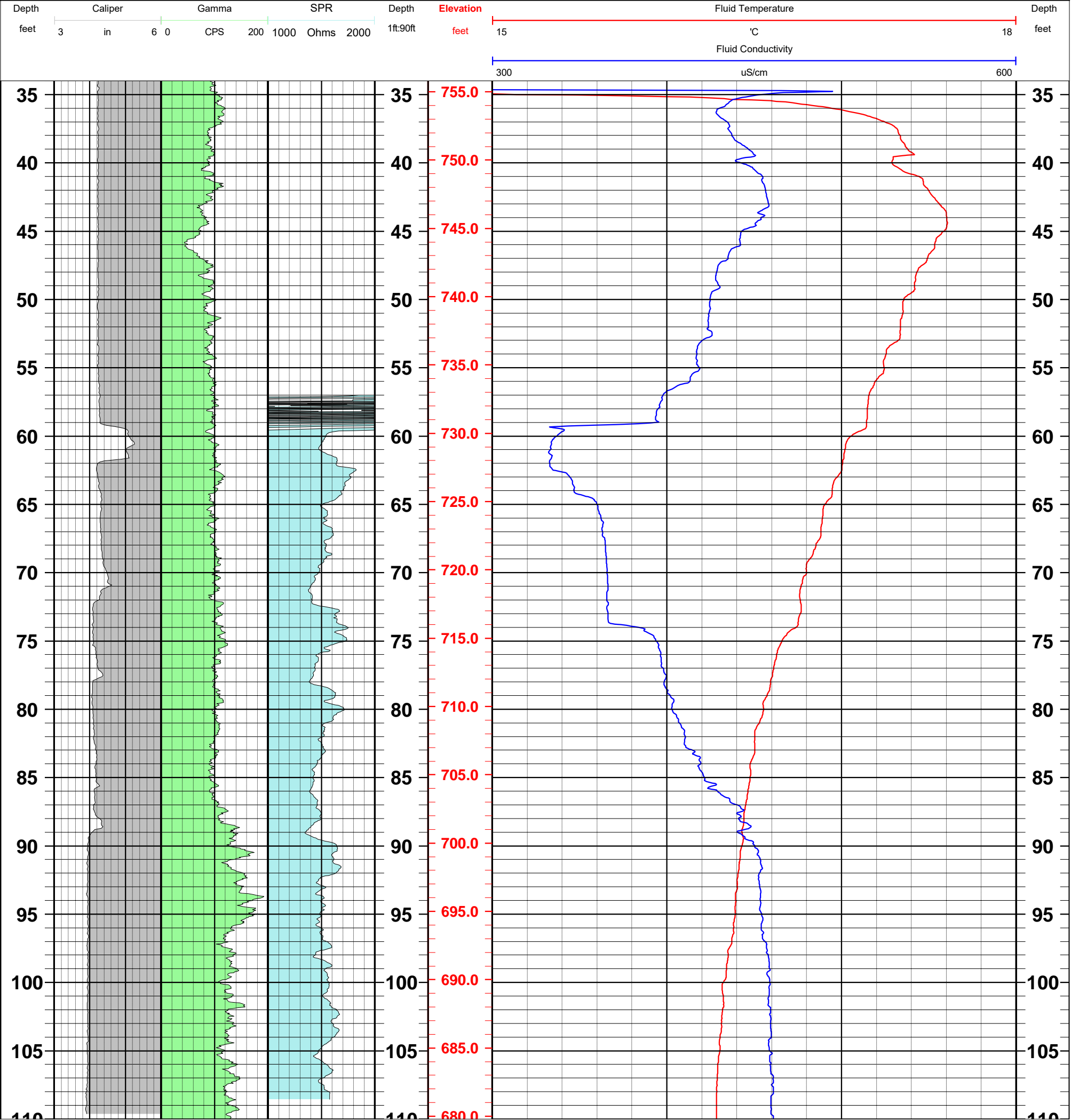
Geophysical Record of Borehole: BW-2

Project Title: Plant McDonough Permitting Support AP-1 Investigation  
Project Number: GL1777449-Y9  
Client: Georgia Power  
Date: April 11, 2023



Driller: Premier	Casing Dia.: 4 in	Log Depth Ref.: Ground Surface	Location: Plant McDonough AP-1
Drilled Depth: 110 ft	Casing Material: PVC	Water Level: see notes	
Drill Date: March 14, 2023	Casing Depth: 59 ft bgs	Borehole Incl.: vertical	Log Date: 3-21-2023 and 4-11-2023
Drill Method.: Mud rotary & HQ core	Casing Stick-up: see notes	Borehole Az.: na	Logged By: Chris Bryant and Geoff Busby
GS Elevation: 789.8 (feet NAVD 88)	Easting: 2201056.5	Northing: 1390483.2	Coord. Sys.: GA ST Plane West (ft NAD83)

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing. The casing stick-up on 3-21-23 was 0.25 ft ags and was below GS on 4-11-2023. Water levels were 35.09' BTC @ 9:07 on 3-21-23 and 34.05' BTC @ 9:18 on 4-11-23





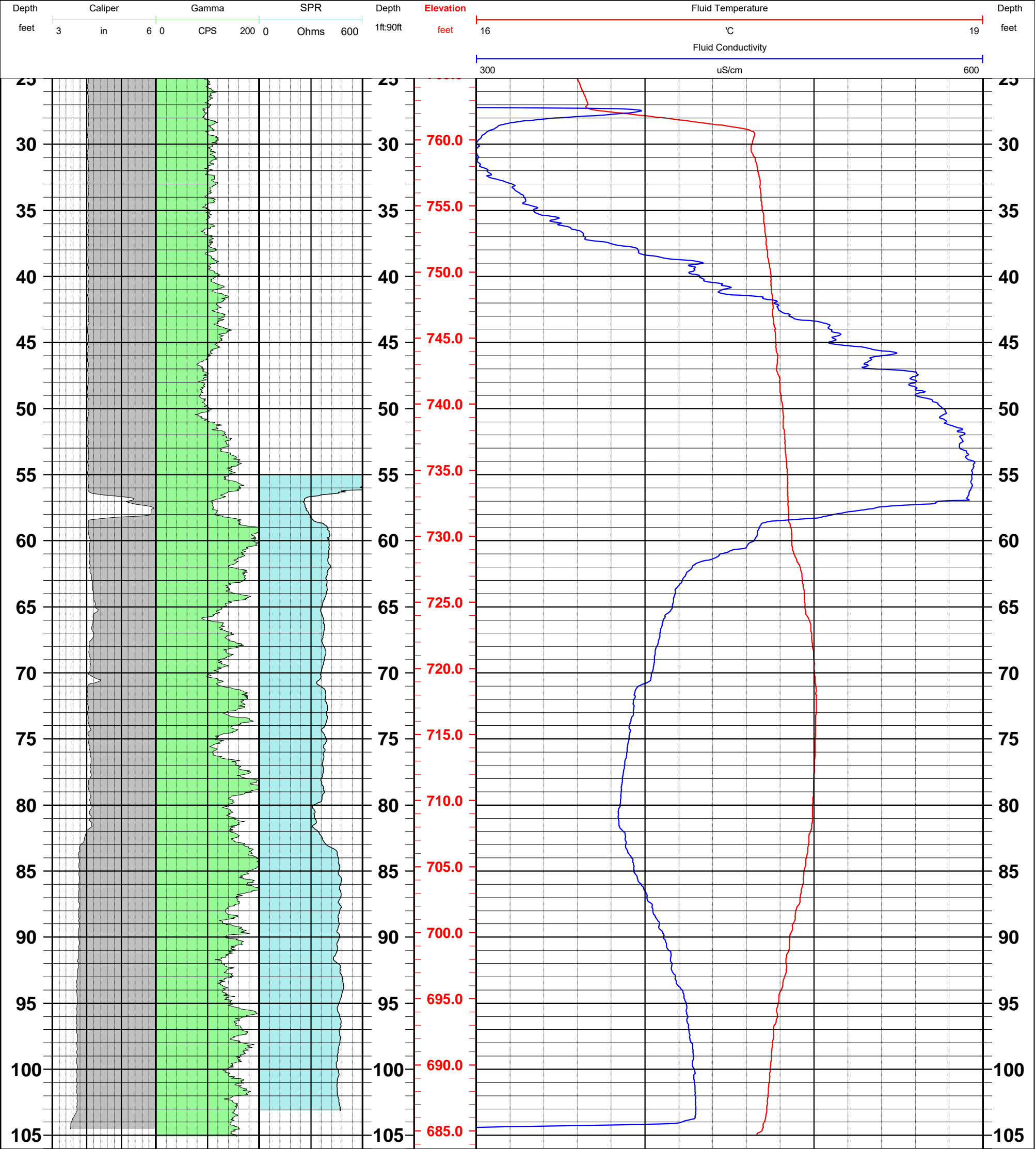
Geophysical Record of Borehole: BW-3

Project Title: Plant McDonough Permitting Support AP-1 Investigation  
Project Number: GL1777449-Y9  
Client: Georgia Power  
Date: April 11, 2023



Driller: Premier	Casing Dia.: 4 in	Log Depth Ref.: Ground Surface	Location: Plant McDonough AP-1
Drilled Depth: 106 ft	Casing Material: PVC	Water Level: 27.44" BTC 12:40	
Drill Date: March 22, 2023	Casing Depth: 57 ft bgs	Borehole Incl.: vertical	Log Date: March 22, 2023
Drill Method.: Mud rotary & HQ core	Casing Stick-up: 0.21 ft ags	Borehole Az.: na	Logged By: Chris Bryant and Geoff Busby
GS Elevation: 789.67 (feet NAVD 88)	Easting: 2201675.12	Northing: 1390653.98	Coord. Sys.: GA ST Plane West (ft NAD83)

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing.





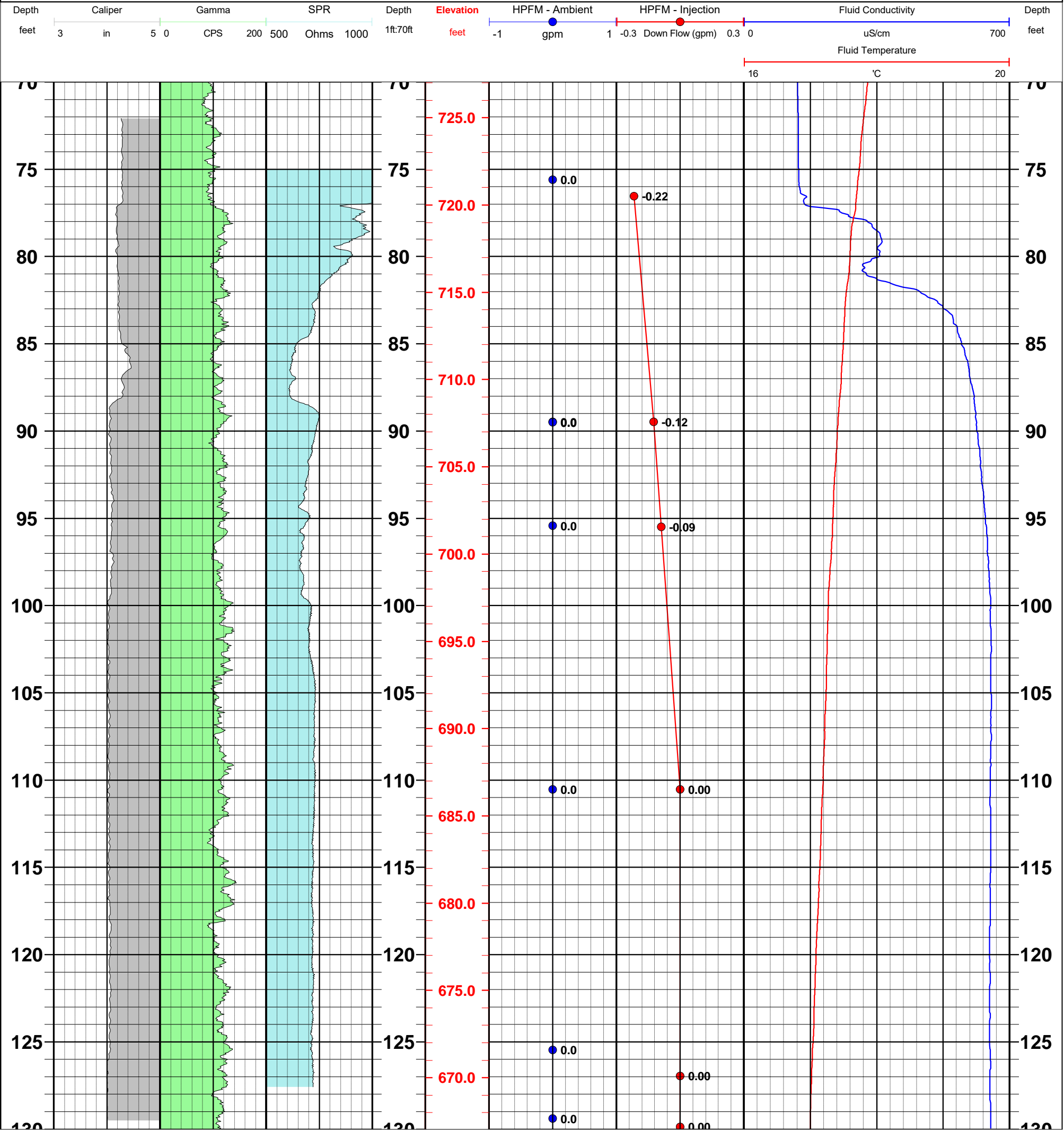
Geophysical Record of Borehole: BW-4

Project Title: Plant McDonough Permitting Support AP-1 Investigation  
Project Number: GL1777449-Y9  
Client: Georgia Power  
Date: April 11, 2023



Driller: Premier	Casing Dia.: 4 in	Log Depth Ref.: Ground Surface	Location: Plant McDonough AP-1
Drilled Depth: 131 ft	Casing Material: PVC	Water Level: 20.53' BGS @ 13:10	
Drill Date: March , 2023	Casing Depth: 77 ft bgs	Borehole Incl.: vertical	Log Date: April 10, 2023
Drill Method.: Mud rotary & HQ core	Casing Stick-up: 0 ft ags	Borehole Az.: na	Logged By: Chris Bryant and Geoff Busby
GS Elevation: 797.05 (feet NAVD 88)	Easting: 2201755.32	Northing: 1391306.59	Coord. Sys.: GA ST Plane West (ft NAD83)

**Notes:** All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing.  
The HPFM was run under ambient conditions and under stressed (injection). No ambient flow was measured. The injection rate was 1 gpm.  
Injection started at 15:46 with the water level at 20.53 ft bgs and ended at 16:16 with water flowing out of the TOC.





**APPENDIX F**

**Hydrogeological Investigation  
Technical Memorandum**





## TECHNICAL MEMORANDUM

**DATE** May 10, 2023

**Project No.** GL1777449-Y9

**TO** David Hannam, P.G.  
WSP USA

**CC** Greg Hebeler, PhD, P.E.  
Lizmarie Steel, P.E.

**FROM** Ryan Feldmann, P.E., Justin White, P.E.

**EMAIL** Justin.White@wsp.com

### **BOREHOLE WATER PRESSURE TESTING METHODS & RESULTS – PLANT MCDONOUGH, ATLANTA, GEORGIA**

This memorandum details the field methods and analyses used for water pressure (packer) tests conducted at the Georgia Power's Plant McDonough facility in Atlanta, Georgia.

The results of each test are presented in one or both of the formats below.

- Lugeon value
- Coefficient of hydraulic conductivity “k” with units centimeters per second (cm/s)

Two different methods of analysis are described in the following sections.

#### **1.0 SUMMARY OF WATER PRESSURE TEST PROCEDURE**

A down-hole straddle packer and multiple single packer configurations (e.g., wireline and conventional) were used to perform hydrogeological testing during and/or after drilling in each borehole. Example test setups for conventional and wireline packer testing are illustrated schematically in Figures 1 and 2.

Where possible, five consecutive water injection (pump-in) tests were conducted, each for a duration of approximately 10 minutes. Generally, the test pressures used were calculated based on overburden pressure as follows.

- Step 1: low pressure; 0.25 x Overburden Pressure
- Step 2: medium pressure; 0.50 x Overburden Pressure
- Step 3: peak pressure; 0.75 x Overburden Pressure
- Step 4: medium pressure (Step 2 pressure); 0.50 x Overburden Pressure
- Step 5: low pressure (Step 1 pressure); 0.25 x Overburden Pressure

The pressures were kept below the overburden pressure for each test to prevent hydraulic jacking of discontinuities in the rock within the test section.

The volume of water pumped into the test section was measured by mechanical flowmeter and recorded each 2 minutes (approximately) of the test. The average flow was then calculated for each pressure step. The average flow was divided by the length of test section, which provides a flow in gallons per minute (gpm) per foot.





## **1.1 Surface Equipment**

The main components for the surface equipment were as follows:

- Drill rig pump used for water withdrawal and injection
- Flow control manifold
- Real-time read-out gauge

The injection pump was the drill rig piston pump with a maximum injection rate of approximately 15-20 gallons per minute (gpm). The main components of the flow control manifold with their functions are described below:

- A bypass gate valve was opened if the flow rate had to be adjusted below the lower limit of the pump.
- A flow meter with a recommended operation range between 0.1 gpm and 20 gpm was used to measure water flow.

## **1.2 Downhole Equipment**

### **1.2.1 Conventional Downhole Equipment**

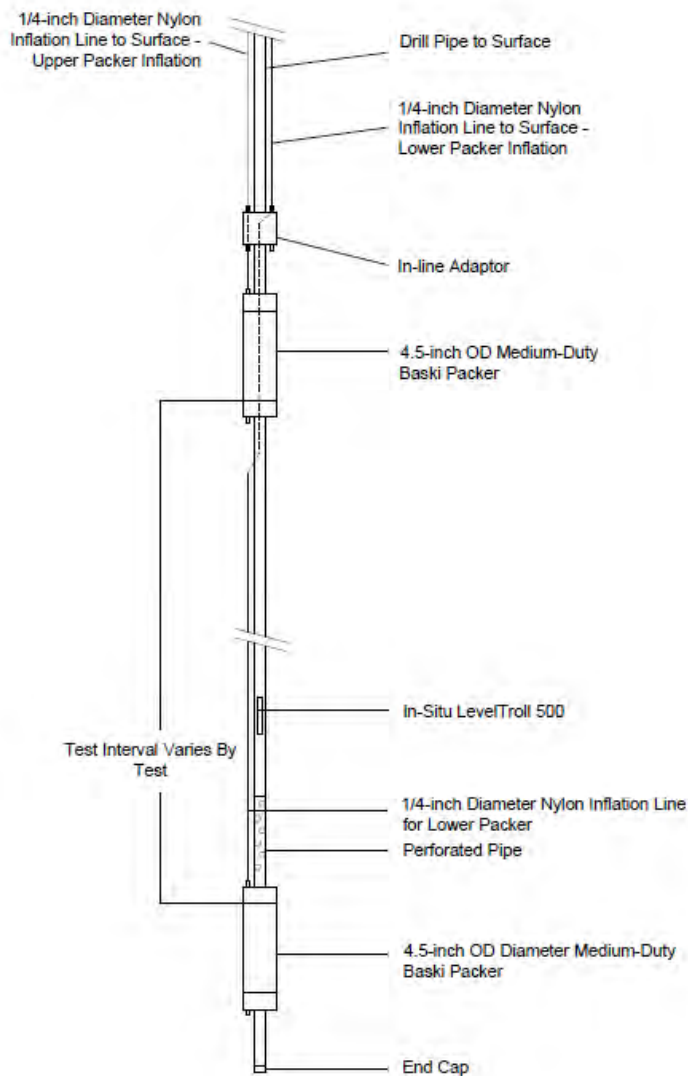
The conventional down-hole packer equipment used for testing consisted of a pneumatic packer tool (either a straddle packer or single packer set up) lowered on 1-inch metal pipe and a data logging pressure transducer in the test interval. Packers were manufactured by QSP Packers, LLC of Sumner, Washington and specifications are listed below:

- Constructed on 1 inch, NPT-threaded, chrome steel mandrel
- Un-inflated diameter of 2.13 inches
- Un-inflated element length of 24.5 inches
- Rated for drillhole diameters up to 4.33 inches
- A maximum pressure differential rating of 500 pounds per square inch (psi) in HQ 3.78-in diameter drillhole

The packers were inflated from the surface through quarter-inch diameter nylon lines (690 psi pressure rating) using compressed Argon gas provided by the driller, Premier Drilling. A schematic of the downhole packer assembly is shown in Figure 1, below.



**Figure 1: Example Conventional Straddle Packer Schematic**



### 1.2.2 Wireline Downhole Equipment

The wireline packer down-hole equipment used for testing consisted of a pneumatic packer tool lowered by wireline and a data logging pressure transducer in the test interval. One packer element was located within the drill rods immediately above the drill bit, and the other packer element seated within the rock interval immediately below the drill bit. For the straddle packer setup, an additional packer was placed below the previously mentioned packers to isolate the interval of interest. Packers were manufactured by QSP Packers, LLC of Sumner, Washington and specifications are listed below:

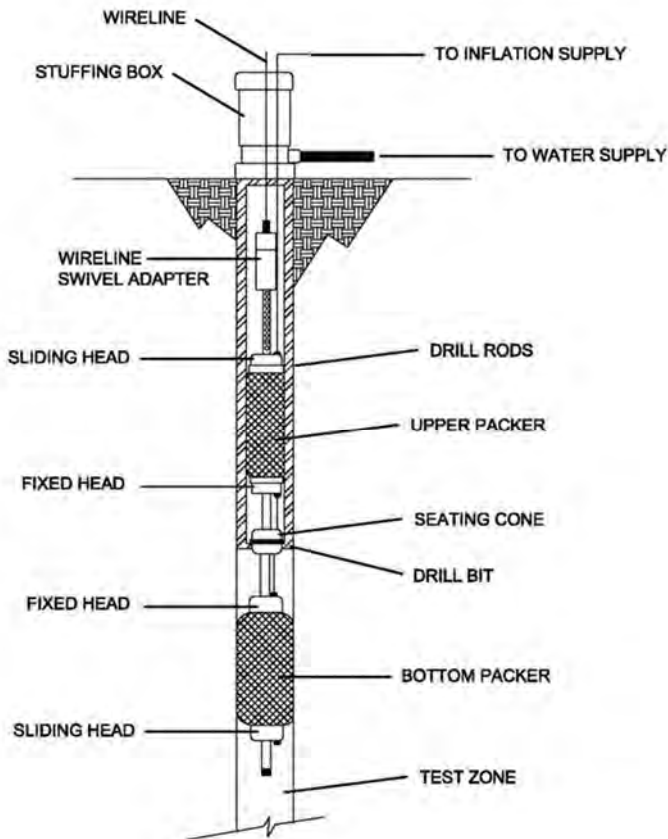
- Constructed on 1 inch, NPT-threaded, chrome steel mandrel
- Un-inflated diameter of 2.13 inches
- Un-inflated element length of 24.5 inches



- Rated for drillhole diameters up to 4.33 inches
- A maximum pressure differential rating of 500 pounds per square inch (psi) in HQ 3.78-in diameter drillhole

The packers were inflated from the surface through quarter-inch diameter nylon lines (690 psi pressure rating) using compressed Argon gas provided by the driller, Premier Drilling. A schematic of the downhole packer assembly is shown in Figure 2, below.

**Figure 2: Example Wireline Packer Testing Tool Schematic**



## 2.0 CALCULATION OF LUGEON VALUES

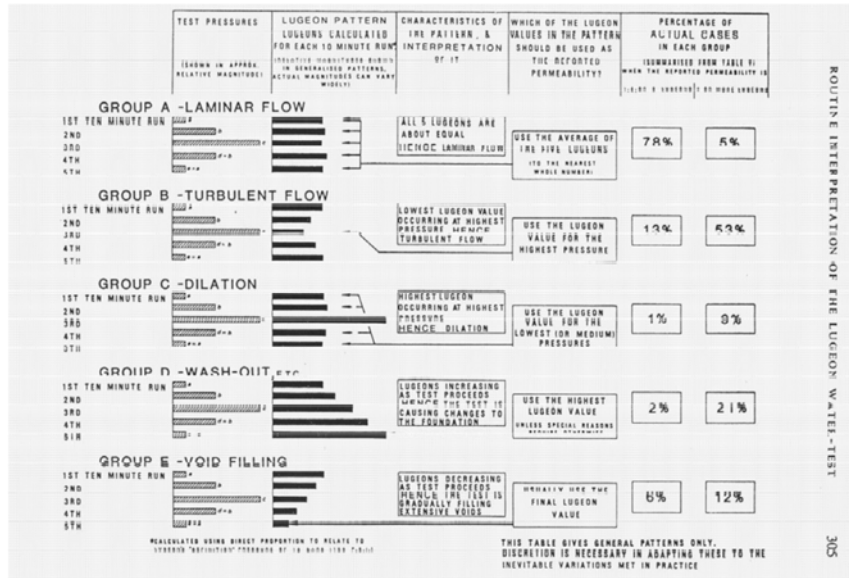
The method used to calculate the Lugeon values was adopted from the paper by A.C. Houlby, entitled "Routine Interpretation of the Lugeon Water Test"<sup>1</sup>. A Lugeon value was calculated for each of the five test stages using the following formula: Lugeon value = water flow in test (liters/meter/minute) x 1000 kPa / test pressure (kPa)

The calculated Lugeon values were then plotted on a bar chart and the observed pattern is interpreted as a "flow type" using guidelines from the Houlby paper, see Figure 3 below. Based on the interpreted flow type, an indicative Lugeon value was chosen as representative of the test section.

<sup>1</sup>A.C. Houlby, Routine Interpretation of the Lugeon Water Test, The Quarterly Journal of Engineering Geology, Vol. 9 (4), 1976.



**Figure 3: Guideline for Interpreting Lugeon Patterns (Sourced from Houlsby)**



An annotated example of the Lugeon calculation is provided in Figure 4 below. Testing results are in Table 1 of Section 4.





Figure 4: Packer Testing Field Form - Annotated

WATER PRESSURE TEST												
Job No.: GL1777443-Y9		Hole No.: BW-2		Drilling Method: HQ		Vertical depth to Groundwater: 35.17		Revision: 0.0		Immediately prior to test (ft bgs): 35.17		
Client: Southern Co.		Dip (Deg): -92		Hole Diameter (in): 0.096		Used in analysis (ft bgs): 35.17						
Project: McDonough Plant		Interval Top (ft): 68.90		Tested Length (ft): 4.63		Pressure Gauge Height (ft bgs): -						
Location: Ash Pond 1		Interval Base (ft): 84.10		Packer Type: Pneumatic - Non-Wireline - Double		Presumed Water Temperature (°C): 18						
Tested By: RUF/CM		Computed By: RUF		Rock used: W2 to W4, Bedrock Schist		Casing Inner Diameter (mm): 27.4						
Date: 3/29/2023		Date: 4/25/2023		Water Meter Reading in US Gallon		Checked By: JCW		Date: 5/1/2023				
Pressure Stage	Interval Pressure (PSI)	No	Actual Time (hrs:min)	Interval (min)	Water Meter Reading (US Gallon)	Volume (US Gallon)	Discharge (L/min)	Discharge (L/min)	Remarks			
P1	21	0	13:09:00	0	97135.22	0.00						
		1	13:11:00	02:00	97138.97	14.20						
		2	13:12:00	01:00	97140.77	6.81						
		3	13:14:00	02:00	97144.23	13.10						
		4	13:15:00	01:00	97145.04	6.47						
		5	13:16:00	01:00	97147.07	6.55						
		6	13:17:00	01:00	97149.34	6.32						
		7	13:18:00	01:00	97151.00	6.28						
		8										
		9										
Total						46.09	9.35			Start Date & Time: 3/29/2023 12:34		
Average						6.584	1.421					
P2	36	0	13:19:00	0	97153.68	0.00						
		1			97156.79	11.77	11.77	2.54				
		2			97159.63	11.51	11.51	2.48				
		3			97162.51	11.66	11.66	2.52				
		4			97165.93	11.43	11.43	2.47				
		5			97168.92	11.32	11.32	2.44				
		6			97171.02	11.36	11.36	2.45				
		7			97174.04	11.43	11.43	2.47				
		8			97177.84	10.98	10.98	2.37				
		9			97180.81	11.24	11.24	2.43				
Total						102.70	22.16					
Average						11.411	2.462					
P3	46	0	13:29:00	0	97155.0	0.00						
		1	13:32:00	03:00	97198.6	51.48	17.16	3.70				
		2	13:33:00	01:00	97203.1	17.03	17.03	3.68				
		3	13:34:00	01:00	97207.7	17.61	17.61	3.75				
		4	13:35:00	01:00	97212.1	18.66	18.66	3.99				
		5	13:36:00	01:00	97216.4	16.28	16.28	3.51				
		6	13:38:00	02:00	97224.8	31.80	15.90	3.33				
		7										
		8										
		9										
Total						100.44	21.67					
Average						16.740	3.612					
P4	35	0	13:39:00	0	97226.2	0.00						
		1	13:40:00	01:00	97231.6	12.87	12.87	2.78				
		2	13:41:00	01:00	97234.8	12.11	12.11	2.61				
		3	13:43:00	02:00	97241.2	24.23	12.11	2.61				
		4	13:44:00	01:00	97244.4	12.11	12.11	2.61				
		5	13:45:00	01:00	97247.6	12.19	12.19	2.63				
		6	13:46:00	01:00	97250.5	12.04	12.04	2.58				
		7	13:47:00	01:00	97253.9	11.73	11.73	2.53				
		8	13:48:00	01:00	97257.0	11.73	11.73	2.53				
		9										
Total						96.91	20.91					
Average						12.113	2.614					
P5	25	1	13:50:00	0	97262.0	0.00						
		2	13:51:00	01:00	97264.4	8.97	8.97	1.94				
		3	13:52:00	01:00	97266.7	8.93	8.93	1.93				
		4	13:54:00	02:00	97271.4	17.68	8.84	1.91				
		5	13:56:00	02:00	97276.7	17.79	8.90	1.92				
		6	13:57:00	01:00	97278.5	9.05	9.05	1.95				
		7	13:58:00	01:00	97280.9	9.05	9.05	1.95				
		8	14:00:00	02:00	97285.7	18.17	9.08	1.95				
		9	14:02:00	02:00	97290.4	17.79	8.90	1.92				
		10	14:03:00	01:00		9.08	9.08	1.95				
		11	14:04:00	01:00		9.08	9.08	1.95				
Total						89.95	19.41			Finish Date & Time: 3/29/2023 14:39		
Average						8.995	1.941					
TEST RESULTS												
Stage No.	Lugeon Value	Lugeon Value Curve		Interval Pressure	Interpreted Result & Hydraulic Conductivity							
P1	16.0			21.1								
P2	16.3			35.7								
P3	16.7			45.7								
P4	17.9			34.6								
P5	18.1			25.4								
Flow Type												
LAMINAR FLOW												
Interpreted Result & Hydraulic Conductivity												
Interpreted Result: 17 uL												
Reported Permeability at Stage: Average:												
K= 2.5-04 cm/sec												
Interpreted Hydraulic Conductivity												





### **3.0 CALCULATION OF INTERVAL TRANSMISSIVITY AND COEFFICIENT OF HYDRAULIC CONDUCTIVITY**

#### **3.1 Analysis Software**

FracMan HydroBench® (version 7.00) was used to analyze slug withdrawal and recovery phases of select tests. HydroBench® is an in-house software developed by WSP and based on a numerical drillhole simulator using an automated matching procedure (nonlinear regression algorithms). In addition, the software includes the deconvolution approach to analyze slug test data. Both homogeneous and composite flow models may be used to interpret the data and the flow geometry may also be matched to infer the local connectivity of a fracture network. HydroBench® includes the derivative of pressure (i.e., rate of pressure change) with respect to the natural logarithm of time that has been shown to significantly improve the diagnostic and quantitative analysis of slug tests and constant-rate pumping tests (Spane and Wurstner 1993). Transmissivity normalized plots are included in the software package and allow comparison of different phases of a hydrogeological test by normalizing the pressure response.

#### **3.2 Input Parameters**

In general, the input parameters for slug tests and constant rate injections are considered to be well constrained. The test interval volume and estimate of the test interval compressibility were used to estimate the wellbore storage. The wellbore storage value was based on the volume change in HQ-size drill pipe or a 5-inch augered borehole per unit change in head taking into account the inclined drill pipe area.

In the analyses, storativity is assumed and skin is a matched parameter with a high correlation between parameters; an order of magnitude error in storativity will typically approach an error in skin by one unit. Skin is dimensionless parameter that defines the disturbed zone from drilling in the immediate vicinity of the borehole wall. A negative skin indicates a near well hydraulic conductivity that is greater than the formation hydraulic conductivity and the opposite for a positive skin value. The analyses emphasized hydraulic properties beyond the skin zone. Total compressibility is the water compressibility plus the formation compressibility on a pore volume basis. The storativity value for each interval was based on an assumed rock mass porosity of 10% (typical for limestone), system compressibility of  $2 \times 10^{-9}$  1/Pa and test interval volume. (Freeze and Cherry, 1979).

### **4.0 TESTING RESULTS**

A total of 17 packers tests were completed in five investigation boreholes (BW-1, BW-2, BW-3, BW-4, and BW-5) covering a cumulative borehole length of 264 feet. The hydraulic conductivity values were primarily moderate ( $1 \times 10^{-4}$  to  $1 \times 10^{-5}$  cm/s), with several in the  $1 \times 10^{-3}$  cm/s (high) range and several in the  $1 \times 10^{-7}$  cm/s (low) range, and a geometric mean of  $5 \times 10^{-5}$  cm/s (~4 Lu).

The hydraulic conductivity/Lugeon distribution is shown on Table 1 based on depth of the test interval.



**Table 1: McDonough Ash Pond 1 Spring 2023 Testing Results**

Borehole	Interval (ft BGS)	Interval Length (ft)	Soil / Rock Layer	Test Sequence	Estimated Lugeons (Lu)	Conductivity k (cm/s)	Transmissivity T (m <sup>2</sup> /s)	Comments
BW-1	27.7-45.0	17.3	PWR	Lugeon	<1	3.E-06	1.E-07	Tested PWR in 5-inch augered broehole.
BW-1	46.0-67.0	21.0	Bedrock	Constant Rate Injection	158	2.E-03	1.E-04	
BW-1	61.2-78.0	16.8	Bedrock	Lugeon	133	1.E-03	7.E-05	
BW-1	76.2-93.0	16.8	Bedrock	Lugeon	2	2.E-05	1.E-06	
BW-2	Open BH, 80.3-ft TD	45.5	Bedrock	Constant Rate Injection	NA	7.E-05	1.E-05	SWL=34.80 ft BGS. Grout/bedrock interface at 62 ft BGS.
BW-2	68.9-84.1	15.2	Bedrock	Lugeon	17	2.E-04	8.E-06	
BW-2	78.1-95.0	16.9	Bedrock	Lugeon	12	1.E-04	6.E-06	
BW-2	96.1-110.0	13.9	Bedrock	Lugeon	<1	5.E-06	2.E-07	
BW-3	62.7-106.0	43.3	Bedrock	Lugeon	9	9.E-05	1.E-05	
BW-3	77.7-106.0	28.3	Bedrock	Lugeon	6	6.E-05	5.E-06	
BW-3	87.6-106.0	18.4	Bedrock	Lugeon	5	5.E-05	3.E-06	
BW-4	82.3-131.0	48.7	Bedrock	Lugeon	2	2.E-05	3.E-06	
BW-4	91.2-116.0	24.8	Bedrock	Lugeon	2	2.E-05	1.E-06	
BW-4	113.1-131.0	17.9	Bedrock	Lugeon	1	1.E-05	5.E-07	
BW-5	Open BH, 25.0-ft total	16.7	PWR	Slug Withdrawal	NA	1.E-04	5.E-06	SWL=8.32 ft BGS. PWR begins between 10.5 and 11 ft BGS.
BW-5	26.2-71.0	44.8	Bedrock	Lugeon	1	1.E-05	1.E-06	
BW-5	54.1-71.0	16.9	Bedrock	Lugeon	2	2.E-05	1.E-06	

**Notes:**

1. SWL - static water level
2. PWR - partially weathered rock
3. ft bgs - ft below ground surface
4. ft - feet
5. cm/s - centimeters per second
6. m<sup>2</sup>/s - square meters per second
7. BH - borehole
8. TD - total depth
9. Lu - Lugeon
10. NA – no applicable

## 4.1 Data Backup

Copies of test calculations sheets are included as attachments to this memorandum.

**Attachments:**

Appendix A – Lugeon Test Sheets

Appendix B – HydroBench Analysis Outputs



**APPENDIX A**

## Lugeon Test Sheets



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Revision : 0.0

Job No. :	GL1777449-Y9	Hole No. :	BW-1	Drilling Method :	HQ	Vertical depth to Groundwater	Immediately prior to test (ft bgs) :	>33
Client :	Southern Co.	Dip (Deg) :	-90	Hole Diameter (m) :	0.096		Used in analysis (ft bgs) :	>33
Project :	McDonough Plant	Interval Top (ft) :	48.06	Tested Length (m) :	5.77		Pressure Gauge Height (ft ags) :	--
Location :	Ash Pond 1	Interval Base (ft) :	67.00	Packer Type:	Pneumatic - Wireline - Single		Presumed Water Temperature (C) :	13
Tested By :	C. Mikilitus	Computed By :	RJF	Rock tested :	W2 to W3 Muscovite Biotite Schist		Casing Inner Diameter (mm ) :	77.8
Date :	3/13/2023	Date :	4/26/2023	Water Meter Reading in US Gallon	Checked By :	JCW	Date :	5/1/2023

Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						
P1	18	0	9:14:00	0	94591.72		0.00	0.00	0.00	c : 1	
		1	9:15:00	01:00	94610.37		70.60	70.60	12.23		
		2	9:16:00	01:00	94629.25		71.47	71.47	12.38		
		3	9:17:00	01:00	94645.28		60.68	60.68	10.51		
		4	9:18:00	01:00	94659.23		52.81	52.81	9.14		
		5	9:19:00	01:00	94678.92		74.53	74.53	12.91		
		6	9:20:00	01:00	94697.95		72.04	72.04	12.48		
		7	9:21:00	01:00	94716.81		71.39	71.39	12.36		
		8	9:22:00	01:00	94735.14		69.39	69.39	12.02		
		9	9:23:00	01:00	94752.92		67.30	67.30	11.66		
		10	9:24:00	01:00	94771.73		71.20	71.20	12.33		
		Total : Average:							681.41	118.01	Start Date & Time : 3/13/2023 9:06
P2	29	0	9:25:00	0	94797.24		0.00	0.00	0.00	c : 1	
		1	9:26:00	01:00	94828.36		117.80	117.80	20.40		
		2	9:27:00	01:00	94859.17		116.63	116.63	20.20		
		3	9:28:00	01:00	94888.45		110.84	110.84	19.19		
		4	9:37:00	09:00	95155.82		1012.11	112.46	19.47		
		5	9:38:00	01:00	95183.23		103.76	103.76	17.97		
		6									
		7									
		8									
		9									
		10									
		Total : Average:							561.48	97.24	
P3	0	0		0			0.00	0.00	0.00	c : 1	Ran out of water (~850 gallons), stop test
		1									
		2									
		3									
		4									
		5									
		6									
		7									
		8									
		9									
		10									
		Total : Average:									
P4	0	0		0			0.00	0.00	0.00	c : 1	
		1									
		2									
		3									
		4									
		5									
		6									
		7									
		8									
		9									
		10									
		Total : Average:									
P5	0	1		0			0.00	0.00	0.00	c : 1	
		2									
		3									
		4									
		5									
		6									
		7									
		8									
		9									
		10									
		11									
		Total : Average:									Finish Date & Time : 3/13/2023 9:40

## TEST RESULTS

Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	158.9		17.6		Interpreted Result      158      uL
P2	157.8		29.2		<div>Reported Permeability at Stage   1 and 2</div> <div>K=      2.E-03      cm/sec</div>
P3	NA		0.0		
P4	NA		0.0		
P5	NA		0.0		
Flow Type					
LAMINAR FLOW		Comments:			

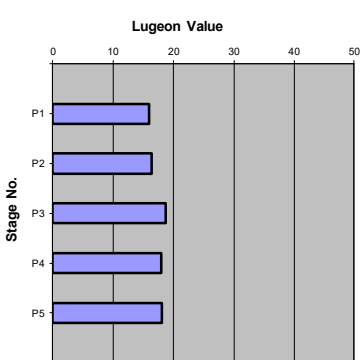
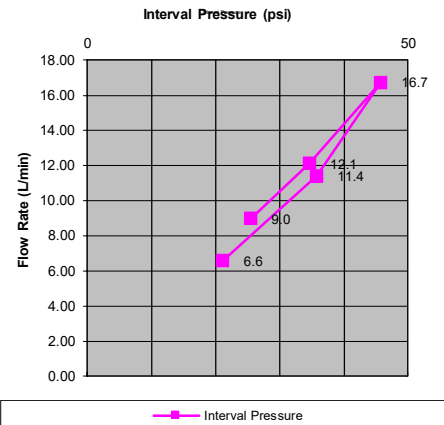


<div><div><div><div><div></div><div>WSP</div></div><div></div></div><div></div><div></div></div><div>WATER PRESSURE TEST</div></div>										Revision : 0.0	
Job No. : GL1777449-Y9		Hole No : BW-1		Drilling Method : HQ		Vertical depth to Groundwater		Immediately prior to test (ft bgs) : 34.40			
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Used in analysis (ft bgs) : 34.40			
Project : McDonough Plant		Interval Top (ft) : 61.16		Tested Length (m) : 5.13				Pressure Gauge Height (ft ags) : --			
Location : Ash Pond 1		Interval Base (ft) : 78.00		Packer Type: Pneumatic - Wireline - Single				Presumed Water Temperature (C) : 16			
Tested By : C. Mikilitus		Computed By : RJF		Rock tested : Slightly Weathered Muscovite Biotite Schist				Casing Inner Diameter (mm ) : 77.8			
Date : 3/13/2023		Date : 4/24/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023			
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time (h:m:s)	Intervals (min)	Reading (US Gallon)		(L)	(L/min)	(L/min/m)		
P1	19	0	12:27	0	95280.61		0.00	0.00	0.00	c : 1	
		1	12:28	01:00	95296.44		59.92	59.92	11.67		
		2	12:30	02:00	95328.58		121.66	60.83	11.85		
		3	12:31	01:00	95344.82		61.48	61.48	11.97		
		4	12:32	01:00	95360.62		59.81	59.81	11.65		
		5	12:33	01:00	95376.63		60.60	60.60	11.80		
		6	12:34	01:00	95392.71		60.87	60.87	11.86		
		7	12:35	01:00	95409.95		65.26	65.26	12.71		
		8	12:36	01:00	95424.88		56.52	56.52	11.01		
		9	12:37	01:00	95440.85		60.45	60.45	11.77		
		10									
		Total : Average:						545.74	106.30	Start Date & Time : 3/13/23 12:18	
								60.638	11.811		
P2	28	0	12:38	0	95459.74		0.00	0.00	0.00	c : 1	
		1	12:39	01:00	95479.62		75.25	75.25	14.66		
		2	12:40	01:00	95499.30		74.50	74.50	14.51		
		3	12:41	01:00	95520.63		80.74	80.74	15.73		
		4	12:42	01:00	95541.85		80.33	80.33	15.65		
		5	12:43	01:00	95561.44		74.16	74.16	14.44		
		6	12:44	01:00	95582.73		80.59	80.59	15.70		
		7	12:45	01:00	95603.82		79.83	79.83	15.55		
		8	12:46	01:00	95623.56		74.72	74.72	14.55		
		9	12:47	01:00	95644.93		80.89	80.89	15.76		
		10									
		Total : Average:						701.02	136.54		
								77.891	15.171		
P3	33	0	12:48	0	95668.15		0.00	0.00	0.00	c : 1	
		1	12:49	01:00	95693.26		95.05	95.05	18.51		
		2	12:50	01:00	95719.03		97.55	97.55	19.00		
		3	12:51	01:00	95744.38		95.96	95.96	18.69		
		4	12:52	01:00	95769.84		96.38	96.38	18.77		
		5	12:53	01:00	95794.95		95.05	95.05	18.51		
		6	12:55	02:00	95844.28		186.73	93.37	18.19		
		7	12:56	01:00	95869.76		96.45	96.45	18.79		
		8	12:57	01:00	95894.74		94.56	94.56	18.42		
		9									
		10									
		Total : Average:						764.37	148.88		
								95.546	18.610		
P4	28	0	13:00	0	95958.54		0.00	0.00	0.00	c : 1	
		1	13:01	01:00	95979.67		79.99	79.99	15.58		
		2	13:02	01:00	96000.69		79.57	79.57	15.50		
		3	13:03	01:00	96021.62		79.23	79.23	15.43		
		4	13:04	01:00	96042.36		78.51	78.51	15.29		
		5	13:05	01:00	96062.08		74.65	74.65	14.54		
		6	13:06	01:00	96082.94		78.96	78.96	15.38		
		7	13:07	01:00	96105.40		85.02	85.02	16.56		
		8									
		9									
		10									
		Total : Average:						555.93	108.28		
								79.418	15.469		
P5	0	1		0			0.00	0.00	0.00	c : 1	
		2									
		3									
		4									
		5									
		6									
		7									
		8									
		9									
		10									
		11									
		Total : Average:								Finish Date & Time : 3/13/23 13:15	
		TEST RESULTS									
Stage No.	Lugeon Value	Lugeon Value Curve			Interval Pressure	Pressure Vs Flow		Interpreted Result & Hydraulic Conductivity			
P1	144.0	<div><div>Lugeon Value</div><div><div>050100150200</div><div><div>P1</div><div>P2</div><div>P3</div><div>P4</div><div>P5</div></div></div></div>			19.4	<div><div>Interval Pressure (psi)</div><div><div>050</div><div><div>120.00</div><div>100.00</div><div>80.00</div><div>60.00</div><div>40.00</div><div>20.00</div><div>0.00</div></div></div><div><div>0.0</div><div>60.6</div><div>79.4</div><div>95.5</div></div></div> <div>Interval Pressure</div>		<div>Interpreted Result133uL</div> <div>Reported Permeability at Stage Average</div> <div>K=1.E-03cm/sec</div>			
P2	127.5				28.2						
P3	132.3				33.3						
P4	130.1				28.2						
P5	NA				0.0						
Flow Type			Comments:								
LAMINAR FLOW											



<div><div><div><div><div>WSP</div></div><div>WATER PRESSURE TEST</div></div><div><div><div>Job No. : GL1777449-Y9</div><div>Client : Southern Co.</div><div>Project : McDonough Plant</div><div>Location : Ash Pond 1</div><div>Tested By : C. Mikilitus</div><div>Date : 3/13/2023</div></div><div><div>Hole No. : BW-1</div><div>Dip (Deg) : -90</div><div>Interval Top (ft) : 76.16</div><div>Interval Base (ft) : 93.00</div><div>Computed By : RJF</div><div>Date : 4/24/2023</div></div><div><div>Drilling Method : HQ</div><div>Hole Diameter (m) : 0.096</div><div>Tested Length (m) : 5.13</div><div>Packer Type: Pneumatic - Wireline - Single</div><div>Rock tested : Slightly Weathered Muscovite Biotite Schist</div><div>Water Meter Reading in US Gallon</div></div><div><div>Vertical depth to Groundwater</div><div>Immediately prior to test (ft bgs) : 30.12</div><div>Used in analysis (ft bgs) : 30.12</div><div>Pressure Gauge Height (ft ags) : --</div><div>Presumed Water Temperature (C) : 15</div><div>Casing Inner Diameter (mm ) : 77.8</div><div>Checked By : JCW</div><div>Date : 5/1/2023</div></div><div>Revision : 0.0</div></div></div></div>											
Pressure Stage	Interval Pressure (PSI)	No	Actual Time (h:m:s)	Time Intervals (min)	Water Meter Readings Reading (US Gallon)		Volume (L)	Discharge (L/min)	Discharge/m (L/min/m)	Remarks	
P1	25	0	15:29:00	0	96138.84		0.00	0.00	0.00	c : 1	
		1	15:30:00	01:00	96139.04		0.76	0.76	0.15		
		2	15:31:00	01:00	96139.31		1.02	1.02	0.20		
		3	15:32:00	01:00	96139.59		1.06	1.06	0.21		
		4	15:33:00	01:00	96139.86		1.02	1.02	0.20		
		5	15:34:00	01:00	96140.13		1.02	1.02	0.20		
		6	15:35:00	01:00	96140.38		0.95	0.95	0.18		
		7	15:36:00	01:00	96140.64		0.98	0.98	0.19		
		8	15:37:00	01:00	96140.91		1.02	1.02	0.20		
		9	15:38:00	01:00	96141.16		0.95	0.95	0.18		
		10	15:39:00		96141.41		0.95				
		Total : Average:							8.78	1.71	Start Date & Time : 3/13/2023 15:21
									0.976	0.190	
P2	33	0	15:40:00	0	96141.81		0.00	0.00	0.00	c : 1	
		1	15:41:00	01:00	96142.22		1.55	1.55	0.30		
		2	15:42:00	01:00	96142.65		1.63	1.63	0.32		
		3	15:43:00	01:00	96143.10		1.70	1.70	0.33		
		4	15:44:00	01:00	96143.53		1.63	1.63	0.32		
		5	15:45:00	01:00	96143.91		1.44	1.44	0.28		
		6	15:46:00	01:00	96144.32		1.55	1.55	0.30		
		7	15:47:00	01:00	96144.73		1.55	1.55	0.30		
		8	15:48:00	01:00	96145.14		1.55	1.55	0.30		
		9	15:49:00	01:00	96145.54		1.51	1.51	0.29		
		10	15:50:00	01:00	96145.95		1.55	1.55	0.30		
		Total : Average:							15.67	3.05	
									1.567	0.305	
P3	44	0	15:51:00	0	96146.54		0.00	0.00	0.00	c : 1	
		1	15:52:00	01:00	96147.15		2.31	2.31	0.45		
		2	15:53:00	01:00	96147.77		2.35	2.35	0.46		
		3	15:54:00	01:00	96148.39		2.35	2.35	0.46		
		4	15:55:00	01:00	96148.98		2.23	2.23	0.44		
		5	15:56:00	01:00	96149.61		2.38	2.38	0.46		
		6	15:57:00	01:00	96150.18		2.16	2.16	0.42		
		7	15:58:00	01:00	96150.77		2.23	2.23	0.44		
		8	15:59:00	01:00	96151.34		2.16	2.16	0.42		
		9	16:00:00	01:00	96151.83		1.85	1.85	0.36		
		10									
		Total : Average:							20.02	3.90	
									2.225	0.433	
P4	34	0	16:01:00	0	96152.37		0.00	0.00	0.00	c : 1	
		1	16:02:00	01:00	96152.80		1.63	1.63	0.32		
		2	16:03:00	01:00	96153.21		1.55	1.55	0.30		
		3	16:04:00	01:00	96153.62		1.55	1.55	0.30		
		4	16:05:00	01:00	96154.03		1.55	1.55	0.30		
		5	16:06:00	01:00	96154.44		1.55	1.55	0.30		
		6	16:07:00	01:00	96154.84		1.51	1.51	0.29		
		7	16:08:00	01:00	96155.24		1.51	1.51	0.29		
		8	16:09:00	01:00	96155.64		1.51	1.51	0.29		
		9	16:10:00	01:00	96156.03		1.48	1.48	0.29		
		10									
		Total : Average:							13.85	2.70	
									1.539	0.300	
P5	24	1	16:11:00	0	96156.30		0.00	0.00	0.00	c : 1	
		2	16:12:00	01:00	96156.56		0.98	0.98	0.19		
		3	16:13:00	01:00	96156.83		1.02	1.02	0.20		
		4	16:14:00	01:00	96157.11		1.06	1.06	0.21		
		5	16:15:00	01:00	96157.37		0.98	0.98	0.19		
		6	16:16:00	01:00	96157.63		0.98	0.98	0.19		
		7	16:17:00	01:00	96157.90		1.02	1.02	0.20		
		8	16:18:00	01:00	96158.15		0.95	0.95	0.18		
		9	16:19:00	01:00	96158.41		0.98	0.98	0.19		
		10	16:20:00	01:00	96158.67		0.98	0.98	0.19		
		11									
		Total : Average:							8.97	1.75	Finish Date & Time : 3/13/2023 16:40
									0.997	0.194	
TEST RESULTS											
Stage No.	Lugeon Value	Lugeon Value Curve		Interval Pressure	Pressure Vs Flow		Interpreted Result & Hydraulic Conductivity				
P1	1.8	<div><div><div>Lugeon Value</div><div><div><div>0</div><div>10</div><div>20</div><div>30</div><div>40</div><div>50</div></div><div><div><div>P1</div><div>P2</div><div>P3</div><div>P4</div><div>P5</div></div><div>Stage No.</div></div></div></div></div>		24.8	<div><div><div>Interval Pressure (psi)</div><div><div><div>0</div><div>2.50</div><div>2.00</div><div>1.50</div><div>1.00</div><div>0.50</div><div>0.00</div></div><div><div><div>Flow Rate (L/min)</div><div>0</div><div>5</div><div>10</div><div>15</div><div>20</div><div>25</div></div><div>Flow Rate (L/min)</div></div></div><div><div><div>Interval Pressure</div></div></div></div></div>		Interpreted Result 2 uL				
P2	2.2			33.4			Reported Permeability at Stage P1, P2, P3, P4				
P3	2.3			43.8			K= 2.E-05 cm/sec				
P4	2.1			33.7							
P5	1.9			23.9							
Flow Type											
LAMINAR FLOW		Comments:									

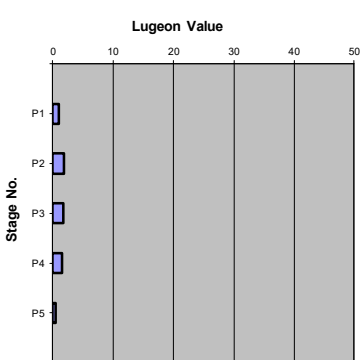
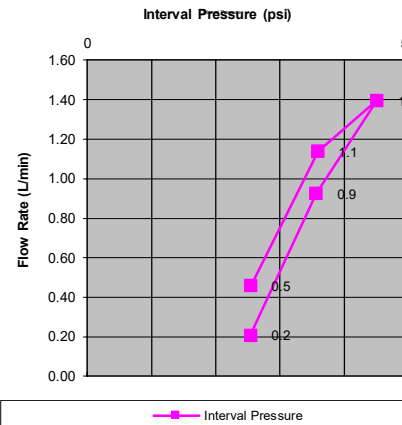


WATER PRESSURE TEST										Revision : 0.0	
Job No. : GL1777449-Y9		Hole No : BW-2		Drilling Method : HQ		Vertical depth to Groundwater		Immediately prior to test (ft bgs) : 35.17		35.17	
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Used in analysis (ft bgs) : 35.17			
Project : McDonough Plant		Interval Top (ft) : 68.90		Tested Length (m) : 4.63				Pressure Gauge Height (ft ags) : --			
Location : Ash Pond 1		Interval Base (ft) : 84.10		Packer Type: Pneumatic - Non-Wireline - Double				Presumed Water Temperature (C) : 18			
Tested By : RJF/CM		Computed By : RJF		Rock tested : W2 to W4 Biotite Schist				Casing Inner Diameter (mm ) : 27.4			
Date : 3/29/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023			
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						
P1	21	0	13:09:00	0	97135.22		0.00	0.00	0.00	c : 1	
		1	13:11:00	02:00	97138.97		14.20	7.10	1.53		
		2	13:12:00	01:00	97140.77		6.81	6.81	1.47		
		3	13:14:00	02:00	97144.23		13.10	6.55	1.41		
		4	13:15:00	01:00	97145.94		6.47	6.47	1.40		
		5	13:16:00	01:00	97147.67		6.55	6.55	1.41		
		6	13:17:00	01:00	97149.34		6.32	6.32	1.36		
		7	13:18:00	01:00	97151.00		6.28	6.28	1.36		
		8									
		9									
		10									
		Total :						46.09	9.95	Start Date & Time : 3/29/2023 12:34	
		Average:						6.584	1.421		
P2	36	0	13:19:00	0	97153.68		0.00	0.00	0.00	c : 1	
		1	13:20:00	01:00	97156.79		11.77	11.77	2.54		
		2	13:21:00	01:00	97159.83		11.51	11.51	2.48		
		3	13:22:00	01:00	97162.91		11.66	11.66	2.52		
		4	13:23:00	01:00	97165.93		11.43	11.43	2.47		
		5	13:24:00	01:00	97168.92		11.32	11.32	2.44		
		6	13:25:00	01:00	97171.92		11.36	11.36	2.45		
		7	13:26:00	01:00	97174.94		11.43	11.43	2.47		
		8	13:27:00	01:00	97177.84		10.98	10.98	2.37		
		9	13:28:00	01:00	97180.81		11.24	11.24	2.43		
		10									
		Total :						102.70	22.16		
		Average:						11.411	2.462		
P3	46	0	13:29:00	0	97185.0		0.00	0.00	0.00	c : 1	
		1	13:32:00	03:00	97198.6		51.48	17.16	3.70		
		2	13:33:00	01:00	97203.1		17.03	17.03	3.68		
		3	13:34:00	01:00	97207.7		17.41	17.41	3.76		
		4	13:35:00	01:00	97212.1		16.66	16.66	3.59		
		5	13:36:00	01:00	97216.4		16.28	16.28	3.51		
		6	13:38:00	02:00	97224.8		31.80	15.90	3.43		
		7									
		8									
		9									
		10									
		Total :						100.44	21.67		
		Average:						16.740	3.612		
P4	35	0	13:39:00	0	97228.2		0.00	0.00	0.00	c : 1	
		1	13:40:00	01:00	97231.6		12.87	12.87	2.78		
		2	13:41:00	01:00	97234.8		12.11	12.11	2.61		
		3	13:43:00	02:00	97241.2		24.23	12.11	2.61		
		4	13:44:00	01:00	97244.4		12.11	12.11	2.61		
		5	13:45:00	01:00	97247.6		12.19	12.19	2.63		
		6	13:46:00	01:00	97250.8		12.04	12.04	2.60		
		7	13:47:00	01:00	97253.9		11.73	11.73	2.53		
		8	13:48:00	01:00	97257.0		11.73	11.73	2.53		
		9									
		10									
		Total :						96.91	20.91		
		Average:						12.113	2.614		
P5	25	1	13:50:00	0	97262.0		0.00	0.00	0.00	c : 1	
		2	13:51:00	01:00	97264.4		8.97	8.97	1.94		
		3	13:52:00	01:00	97266.7		8.93	8.93	1.93		
		4	13:54:00	02:00	97271.4		17.68	8.84	1.91		
		5	13:56:00	02:00	97276.1		17.79	8.90	1.92		
		6	13:57:00	01:00	97278.5		9.08	9.08	1.96		
		7	13:58:00	01:00	97280.9		9.08	9.08	1.96		
		8	14:00:00	02:00	97285.7		18.17	9.08	1.96		
		9	14:02:00	02:00	97290.4		17.79	8.90	1.92		
		10	14:03:00	01:00	97292.8		9.08	9.08	1.96		
		11	14:04:00	01:00	97295.2		9.08	9.08	1.96		
		Total :						89.96	19.41	Finish Date & Time : 3/29/2023 14:39	
		Average:						8.996	1.941		
TEST RESULTS											
Stage No.	Lugeon Value	Lugeon Value Curve		Interval Pressure	Pressure Vs Flow			Interpreted Result & Hydraulic Conductivity			
P1	16.0			21.1				Interpreted Result 17 uL			
P2	16.3			35.7				Reported Permeability at Stage Average K= 2.E-04 cm/sec			
P3	18.7			45.7							
P4	17.9			34.6							
P5	18.1			25.4							
Flow Type				Comments:							
LAMINAR FLOW											

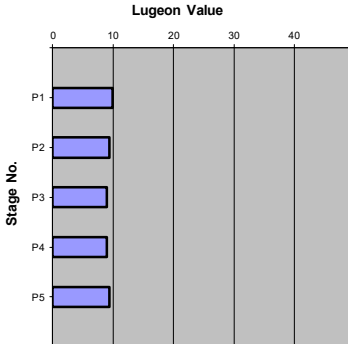
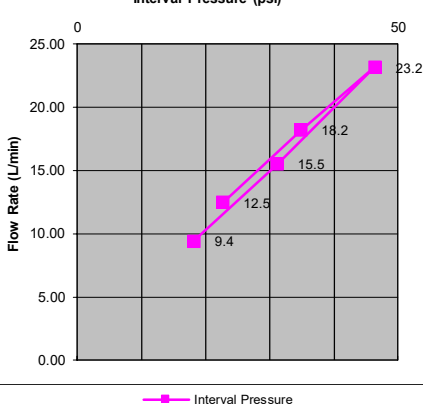


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Job No. : GL1777449-Y9		Hole No : BW-2		Drilling Method : HQ		Vertical depth to Groundwater		Immediately prior to test (ft bgs) : 37.30				
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Used in analysis (ft bgs) : 37.30				
Project : McDonough Plant		Interval Top (ft) : 78.13		Tested Length (m) : 5.14				Pressure Gauge Height (ft ags) : --				
Location : Ash Pond 1		Interval Base (ft) : 95.00		Packer Type: Pneumatic - Wireline - Single				Presumed Water Temperature (C) : 13				
Tested By : C. Mikilitus		Computed By : RJF		Rock tested : W2 to W3 Biotite Schist				Casing Inner Diameter (mm ) : 77.8				
Date : 3/15/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023				
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks		
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)			
			(h:m:s)	(min)	(US Gallon)							
P1	25	0	9:49:00	0	96389.58		0.00	0.00	0.00	c : 1		
		1	9:50:00	01:00	96390.63		3.97	3.97	0.77			
		2	9:51:00	01:00	96392.44		6.85	6.85	1.33			
		3	9:52:00	01:00	96394.22		6.74	6.74	1.31			
		4	9:53:00	01:00	96396.01		6.78	6.78	1.32			
		5	9:54:00	01:00	96397.82		6.85	6.85	1.33			
		6	9:55:00	01:00	96399.63		6.85	6.85	1.33			
		7	9:56:00	01:00	96402.26		9.96	9.96	1.94			
		8	9:57:00	01:00	96403.16		3.41	3.41	0.66			
		9	9:58:00	01:00	96404.71		5.87	5.87	1.14			
		10	9:59:00		96406.41		6.44					
		Total :							57.27		11.14	Start Date & Time : 3/15/2023 9:37
		Average:							6.364		1.237	
P2	34	0	10:00:00	0	96408.85		0.00	0.00	0.00	c : 1		
		1	10:01:00	01:00	96411.29		9.24	9.24	1.80			
		2	10:02:00	01:00	96413.72		9.20	9.20	1.79			
		3	10:03:00	01:00	96416.15		9.20	9.20	1.79			
		4	10:04:00	01:00	96418.55		9.08	9.08	1.77			
		5	10:05:00	01:00	96420.02		5.56	5.56	1.08			
		6	10:06:00	01:00	96423.32		12.49	12.49	2.43			
		7	10:07:00	01:00	96425.83		9.50	9.50	1.85			
		8	10:08:00	01:00	96428.15		8.78	8.78	1.71			
		9	10:09:00	01:00	96430.68		9.58	9.58	1.86			
		10										
		Total :							82.64		16.07	
		Average:							9.182		1.785	
P3	46	0	10:10:00	0	96433.82		0.00	0.00	0.00	c : 1		
		1	10:11:00	01:00	96437.53		14.04	14.04	2.73			
		2	10:12:00	01:00	96440.61		11.66	11.66	2.27			
		3	10:13:00	01:00	96444.24		13.74	13.74	2.67			
		4	10:14:00	01:00	96447.53		12.45	12.45	2.42			
		5	10:15:00	01:00	96451.12		13.59	13.59	2.64			
		6	10:16:00	01:00	96454.43		12.53	12.53	2.44			
		7	10:17:00	01:00	96457.53		11.73	11.73	2.28			
		8	10:18:00	01:00	96461.03		13.25	13.25	2.58			
		9	10:19:00	01:00	96463.92		10.94	10.94	2.13			
		10										
		Total :							113.94		22.15	
		Average:							12.660		2.461	
P4	35	0	10:20:00	0	96466.21		0.00	0.00	0.00	c : 1		
		1	10:21:00	01:00	96469.13		11.05	11.05	2.15			
		2	10:22:00	01:00	96471.45		8.78	8.78	1.71			
		3	10:23:00	01:00	96473.96		9.50	9.50	1.85			
		4	10:24:00	01:00	96476.32		8.93	8.93	1.74			
		5	10:25:00	01:00	96478.74		9.16	9.16	1.78			
		6	10:27:00	02:00	96483.92		19.61	9.80	1.91			
		7	10:28:00	01:00	96486.03		7.99	7.99	1.55			
		8	10:29:00	01:00	96488.47		9.24	9.24	1.80			
		9										
		10										
		Total :							74.46		14.48	
		Average:							9.307		1.810	
P5	24	1	10:30:00	0	96490.20		0.00	0.00	0.00	c : 1		
		2	10:31:00	01:00	96491.92		6.51	6.51	1.27			
		3	10:32:00	01:00	96493.64		6.51	6.51	1.27			
		4	10:33:00	01:00	96495.37		6.55	6.55	1.27			
		5	10:34:00	01:00	96497.10		6.55	6.55	1.27			
		6	10:35:00	01:00	96498.82		6.51	6.51	1.27			
		7	10:36:00	01:00	96500.55		6.55	6.55	1.27			
		8	10:37:00	01:00	96502.23		6.36	6.36	1.24			
		9	10:38:00	01:00	96503.97		6.59	6.59	1.28			
		10	10:39:00	01:00	96505.68		6.47	6.47	1.26			
		11										
		Total :							58.60		11.39	Finish Date & Time : 3/15/2023 10:54
		Average:							6.511		1.266	
TEST RESULTS												
Stage No.	Lugeon Value	Lugeon Value Curve		Interval Pressure	Pressure Vs Flow		Interpreted Result & Hydraulic Conductivity					
P1	11.9	<div><div><div>Lugeon Value</div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></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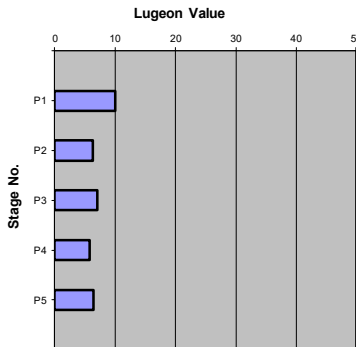
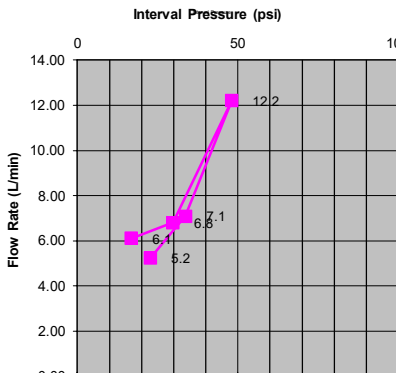


WATER PRESSURE TEST										Revision : 0.0	
Job No. : GL1777449-Y9		Hole No. : BW-2		Drilling Method : HQ		Vertical depth to Groundwater		Immediately prior to test (ft bgs) : 35.46		35.46	
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Used in analysis (ft bgs) : 35.46			
Project : McDonough Plant		Interval Top (ft) : 96.06		Tested Length (m) : 4.25				Pressure Gauge Height (ft ags) : --			
Location : Ash Pond 1		Interval Base (ft) : 110.00		Packer Type: Pneumatic - Wireline - Single				Presumed Water Temperature (C) : 17			
Tested By : C. Mikilitus		Computed By : RJF		Rock tested : Moderately Weathered Biotite Schist				Casing Inner Diameter (mm ) : 77.8			
Date : 3/15/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023			
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						
P1	25	0	12:28:00	0	96522.76		0.00	0.00	0.00	c : 1	
		1	12:29:00	01:00	96522.93		0.64	0.64	0.15		
		2	12:30:00	01:00	96523.07		0.53	0.53	0.12		
		3	12:31:00	01:00	96523.20		0.49	0.49	0.12		
		4	12:32:00	01:00	96523.32		0.45	0.45	0.11		
		5	12:33:00	01:00	96523.45		0.49	0.49	0.12		
		6	12:34:00	01:00	96523.57		0.45	0.45	0.11		
		7	12:35:00	01:00	96523.67		0.38	0.38	0.09		
		8	12:36:00	01:00	96523.78		0.42	0.42	0.10		
		9	12:37:00	01:00	96523.88		0.38	0.38	0.09		
		10	12:38:00	01:00	96523.97		0.34	0.34	0.08		
		Total :						4.58	1.08		Start Date & Time : 3/15/2023 12:19
		Average:						0.458	0.108		
P2	36	0	12:39:00	0	96524.25		0.00	0.00	0.00	c : 1	
		1	12:40:00	01:00	96524.59		1.29	1.29	0.30		
		2	12:41:00	01:00	96524.91		1.21	1.21	0.29		
		3	12:42:00	01:00	96525.23		1.21	1.21	0.29		
		4	12:43:00	01:00	96525.55		1.21	1.21	0.29		
		5	12:44:00	01:00	96525.84		1.10	1.10	0.26		
		6	12:45:00	01:00	96526.14		1.14	1.14	0.27		
		7	12:46:00	01:00	96526.42		1.06	1.06	0.25		
		8	12:47:00	01:00	96526.69		1.02	1.02	0.24		
		9	12:48:00	01:00	96526.96		1.02	1.02	0.24		
		10									
		Total :						10.26	2.41		
		Average:						1.140	0.268		
P3	45	0	12:49:00	0	96527.36		0.00	0.00	0.00	c : 1	
		1	12:50:00	01:00	96527.78		1.59	1.59	0.37		
		2	12:51:00	01:00	96528.17		1.48	1.48	0.35		
		3	12:52:00	01:00	96528.54		1.40	1.40	0.33		
		4	12:53:00	01:00	89658.92		-26004.34	-26004.34	-6118.67		
		5	12:54:00	01:00	96529.27		26007.11	26007.11	6119.32		
		6	12:55:00	01:00	96529.63		1.36	1.36	0.32		
		7	12:56:00	01:00	96529.98		1.32	1.32	0.31		
		8	12:57:00	01:00	96530.33		1.32	1.32	0.31		
		9	12:58:00	01:00	96530.68		1.32	1.32	0.31		
		10									
		Total :						12.57	2.96		
		Average:						1.396	0.329		
P4	36	0	12:59:00	0	96530.93		0.00	0.00	0.00	c : 1	
		1	13:00:00	01:00	96531.18		0.95	0.95	0.22		
		2	13:01:00	01:00	96531.42		0.91	0.91	0.21		
		3	13:02:00	01:00	96531.67		0.95	0.95	0.22		
		4	13:03:00	01:00	96531.93		0.98	0.98	0.23		
		5	13:04:00	01:00	96532.18		0.95	0.95	0.22		
		6	13:05:00	01:00	96532.42		0.91	0.91	0.21		
		7	13:06:00	01:00	96532.66		0.91	0.91	0.21		
		8	13:07:00	01:00	96532.89		0.87	0.87	0.20		
		9	13:08:00	01:00	96533.13		0.91	0.91	0.21		
		10									
		Total :						8.33	1.96		
		Average:						0.925	0.218		
P5	25	1	13:09:00	0	96533.37		0.00	0.00	0.00	c : 1	
		2	13:10:00	01:00	96533.61		0.91	0.91	0.21		
		3	13:11:00	01:00	96533.65		0.15	0.15	0.04		
		4	13:12:00	01:00	96533.65		0.00	0.00	0.00		
		5	13:13:00	01:00	96533.67		0.08	0.08	0.02		
		6	13:14:00	01:00	96533.69		0.08	0.08	0.02		
		7	13:15:00	01:00	96533.70		0.04	0.04	0.01		
		8									
		9									
		10									
		11									
		Total :						1.25	0.29		Finish Date & Time : 3/15/2023 13:33
		Average:						0.208	0.049		
TEST RESULTS											
Stage No.	Lugeon Value	Lugeon Value Curve			Interval Pressure	Pressure Vs Flow		Interpreted Result & Hydraulic Conductivity			
P1	1.0				25.4			Reported Permeability at Stage P5  K= 5.E-06 cm/sec			
P2	1.8				35.9						
P3	1.7				45.2						
P4	1.4				35.7						
P5	0.5				25.4						
Flow Type					Comments:						
DILATION											



WATER PRESSURE TEST										
Job No. : GL1777449-Y9		Hole No. : BW-3		Drilling Method : HQ		Vertical depth to Groundwater		Revision : 0.0		26.39
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Immediately prior to test (ft bgs) : 26.39		26.39
Project : McDonough Plant		Interval Top (ft) : 62.68		Tested Length (m) : 13.21				Pressure Gauge Height (ft ags) : --		21
Location : Ash Pond 1		Interval Base (ft) : 106.00		Packer Type: Pneumatic - Non-Wireline - Single				Presumed Water Temperature (C) : 21		27.4
Tested By : R. Feldmann		Computed By : RJF		Rock tested : W1 to W4 Muscovite Biotite Schist				Casing Inner Diameter (mm) : 27.4		5/1/2023
Date : 3/28/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023		
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)	
			(h:m:s)	(min)	(US Gallon)					
P1	23	0	13:57:00	0	96900.1		0.00	0.00	0.00	c : 1
		1	13:58:00	01:00	96903.8		14.08	14.08	1.07	
		2	13:59:00	01:00	96907.4		13.67	13.67	1.03	
		3	14:00:00	01:00	96910.7		12.57	12.57	0.95	
		4	14:01:00	01:00	96913.9		12.11	12.11	0.92	
		5	14:02:00	01:00	96917.2		12.49	12.49	0.95	
		6	14:03:00	01:00	96920.5		12.49	12.49	0.95	
		7	14:04:00	01:00	96923.7		12.11	12.11	0.92	
		8	14:05:00	01:00	96926.8		11.73	11.73	0.89	
		9	14:06:00	01:00	96930.0		12.11	12.11	0.92	
		10	14:08:00	02:00	96936.1		23.09	11.55	0.87	
		Total :						124.92	9.46	Start Date & Time : 3/28/2023 13:28
		Average:						12.492	0.946	
P2	35	0	14:09:00	0	96940.7		0.00	0.00	0.00	c : 1
		1	14:10:00	01:00	96945.5		18.17	18.17	1.38	
		2	14:11:00	01:00	96950.4		18.55	18.55	1.40	
		3	14:13:00	02:00	96960.2		37.10	18.55	1.40	
		4	14:14:00	01:00	96964.9		17.79	17.79	1.35	
		5	14:15:00	01:00	96969.7		18.17	18.17	1.38	
		6	14:17:00	02:00	96979.2		35.96	17.98	1.36	
		7	14:18:00	01:00	96984.0		18.17	18.17	1.38	
		8								
		9								
		10								
		Total :						127.38	9.64	
		Average:						18.197	1.378	
P3	46	0	14:19:00	0	96990.3		0.00	0.00	0.00	c : 1
		1	14:20:00	01:00	96996.5		23.47	23.47	1.78	
		2	14:21:00	01:00	97002.7		23.47	23.47	1.78	
		3	14:22:00	01:00	97008.0		20.06	20.06	1.52	
		4	14:23:00	01:00	97015.0		26.50	26.50	2.01	
		5	14:25:00	02:00	97027.3		46.56	23.28	1.76	
		6	14:26:00	01:00	97033.4		23.09	23.09	1.75	
		7	14:27:00	01:00	97039.5		23.09	23.09	1.75	
		8	14:28:00	01:00	97045.6		23.09	23.09	1.75	
		9	14:29:00	01:00	97051.6		22.71	22.71	1.72	
		10	14:30:00	01:00	97057.7		23.09	23.09	1.75	
		Total :						231.86	17.56	
		Average:						23.186	1.756	
P4	31	0	14:31:00	0	97062.2		0.00	0.00	0.00	c : 1
		1	14:32:00	01:00	97066.3		15.52	15.52	1.18	
		2	14:33:00	01:00	97070.4		15.52	15.52	1.18	
		3	14:35:00	02:00	97078.6		31.04	15.52	1.18	
		4	14:36:00	01:00	97082.7		15.52	15.52	1.18	
		5	14:38:00	02:00	97090.9		31.04	15.52	1.18	
		6	14:39:00	01:00	97095.1		15.90	15.90	1.20	
		7	14:40:30	01:30	97101.1		22.71	15.14	1.15	
		8								
		9								
		10								
		Total :						108.64	8.23	
		Average:						15.520	1.175	
P5	18	1	14:41:00	0	97102.5		0.00	0.00	0.00	c : 1
		2	14:42:00	01:00	97105.3		10.60	10.60	0.80	
		3	14:43:00	01:00	97108.0		10.22	10.22	0.77	
		4	14:44:00	01:00	97110.7		10.22	10.22	0.77	
		5	14:46:00	02:00	97115.8		19.31	9.65	0.73	
		6	14:49:00	03:00	97123.1		27.63	9.21	0.70	
		7	14:51:00	02:00	97127.6		17.03	8.52	0.64	
		8	14:52:00	01:00	97129.6		7.57	7.57	0.57	
		9								
		10								
		11								
		Total :						65.99	5.00	Finish Date & Time : 3/28/2023 15:13
		Average:						9.427	0.714	
TEST RESULTS										
Stage No.	Lugeon Value	Lugeon Value Curve		Interval Pressure	Pressure Vs Flow			Interpreted Result & Hydraulic Conductivity		
P1	9.9			22.6				Interpreted Result 9 uL		
P2	9.4			34.8				Reported Permeability at Stage P2 through P5		
P3	9.0			46.4						
P4	8.9			31.1						
P5	9.3			18.2						
Flow Type				Comments: First Step was filling the voids						
LAMINAR FLOW										



WATER PRESSURE TEST										Revision : 0.0	
Job No. : GL1777449-Y9		Hole No : BW-3		Drilling Method : HQ		Vertical depth to Groundwater		Immediately prior to test (ft bgs) : 26.45		26.45	
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Used in analysis (ft bgs) : 26.45			
Project : McDonough Plant		Interval Top (ft) : 77.69		Tested Length (m) : 8.63				Pressure Gauge Height (ft ags) : --			
Location : Ash Pond 1		Interval Base (ft) : 106.00		Packer Type: Pneumatic - Non-Wireline - Single				Presumed Water Temperature (C) : 21			
Tested By : R. Feldmann		Computed By : RJF		Rock tested : W1 to W4 Muscovite Biotite Schist				Casing Inner Diameter (mm ) : 27.4			
Date : 3/28/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023			
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						
P1	17	0	12:06:00	0	96800.56		0.00	0.00	0.00	c : 1	
		1	12:07:00	01:00	96802.05		5.64	5.64	0.65		
		2	12:08:00	01:00	96803.48		5.41	5.41	0.63		
		3	12:09:00	01:00	96804.83		5.11	5.11	0.59		
		4	12:10:00	01:00	96806.08		4.73	4.73	0.55		
		5	12:11:00	01:00	96807.36		4.85	4.85	0.56		
		6	12:12:00	01:00	96809.89		9.58	9.58	1.11		
		7	12:13:00	01:00	96811.88		7.53	7.53	0.87		
		8									
		9									
		10									
		Total :						42.85	4.96		Start Date & Time : 3/28/2023 11:23
		Average:						6.122	0.709		
P2	30	0	12:14:00	0	96811.88		0.00	0.00	0.00	c : 1	
		1	12:15:00	01:00	96813.77		7.15	7.15	0.83		
		2	12:16:00	01:00	96815.59		6.89	6.89	0.80		
		3	12:17:00	01:00	96817.42		6.93	6.93	0.80		
		4	12:18:00	01:00	96819.23		6.85	6.85	0.79		
		5	12:19:00	01:00	96821.00		6.70	6.70	0.78		
		6	12:21:00	02:00	96824.59		13.59	6.79	0.79		
		7	12:22:00	01:00	96826.38		6.78	6.78	0.79		
		8	12:23:00	01:00	96828.14		6.66	6.66	0.77		
		9	12:24:00	01:00	96829.85		6.47	6.47	0.75		
		10									
		Total :						61.23	7.09		
		Average:						6.803	0.788		
P3	48	0	12:27:00	0	96838.18		0.00	0.00	0.00	c : 1	
		1	12:28:00	01:00	96840.97		10.56	10.56	1.22		
		2	12:29:00	01:00	96843.74		10.49	10.49	1.21		
		3	12:30:00	01:00	96849.31		21.08	21.08	2.44		
		4	12:31:00	01:00	96851.98		10.11	10.11	1.17		
		5	12:32:00	01:00	96857.14		19.53	19.53	2.26		
		6	12:34:00	02:00	96862.37		19.80	9.90	1.15		
		7	12:36:00	02:00	96864.39		7.65	3.82	0.44		
		8									
		9									
		10									
		Total :						85.49	9.91		
		Average:						12.213	1.415		
P4	34	0	12:37:00	0	96864.39		0.00	0.00	0.00	c : 1	
		1	12:39:00	02:00	96868.13		14.16	7.08	0.82		
		2	12:43:00	04:00	96873.55		20.52	5.13	0.59		
		3	12:45:00	02:00	96875.29		6.59	3.29	0.38		
		4	12:47:00	02:00	96882.09		25.74	12.87	1.49		
		5									
		6									
		7									
		8									
		9									
		10									
		Total :						28.37	3.29		
		Average:						7.093	0.822		
P5	23	1	12:48:00	0	96882.09		0.00	0.00	0.00	c : 1	
		2	12:49:00	01:00	96884.57		9.39	9.39	1.09		
		3	12:51:00	02:00	96887.00		9.20	4.60	0.53		
		4	12:52:00	01:00	96888.22		4.62	4.62	0.54		
		5	12:54:00	02:00	96890.59		8.97	4.49	0.52		
		6	12:55:00	01:00	96891.78		4.50	4.50	0.52		
		7	12:56:00	01:00	96892.96		4.47	4.47	0.52		
		8	12:57:00	01:00	96894.18		4.62	4.62	0.54		
		9									
		10									
		11									
		Total :						36.68	4.25		
		Average:						5.240	0.607		
TEST RESULTS											
Stage No.	Lugeon Value	Lugeon Value Curve			Interval Pressure	Pressure Vs Flow			Interpreted Result & Hydraulic Conductivity		
P1	10.0				16.8				Interpreted Result 6 uL		
P2	6.3				29.8				Reported Permeability at Stage P2 through P5		
P3	7.0				48.1				K= 6.E-05 cm/sec		
P4	5.8				33.6						
P5	6.3				22.7						
Flow Type					Comments: First Step was filling the voids						
LAMINAR FLOW											





Revision : 0.0

Job No. :	GL1777449-Y9	Hole No. :	BW-3	Drilling Method :	HQ	Vertical depth to Groundwater	Immediately prior to test (ft bgs) :	27.31
Client :	Southern Co.	Dip (Deg) :	-90	Hole Diameter (m) :	0.096		Used in analysis (ft bgs) :	27.31
Project :	McDonough Plant	Interval Top (ft) :	87.54	Tested Length (m) :	5.63		Pressure Gauge Height (ft ags) :	--
Location :	Ash Pond 1	Interval Base (ft) :	106.00	Packer Type:	Pneumatic - Non-Wireline - Single		Presumed Water Temperature (C) :	19
Tested By :	R. Feldmann	Computed By :	RJF	Rock tested :	W1 to W2 Muscovite Biotite Schist		Casing Inner Diameter (mm ) :	27.4
Date :	3/28/2023	Date :	4/25/2023	Water Meter Reading in US Gallon		Checked By :	JCW	Date : 5/1/2023

Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m		
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)	Remarks	
			(h:m:s)	(min)	(US Gallon)						c :
P1	24	0	9:57:00	0	96744.00		0.00	0.00	0.00	c :	1
		1	9:59:00	02:00	96745.99		7.53	3.77	0.67		
		2	10:00:00	01:00	96746.84		3.22	3.22	0.57		
		3	10:01:00	01:00	96747.66		3.10	3.10	0.55		
		4	10:02:00	01:00	96748.45		2.99	2.99	0.53		
		5	10:04:00	02:00	96749.99		5.83	2.91	0.52		
		6	10:05:00	01:00	96750.73		2.80	2.80	0.50		
		7									
		8									
		9									
		10									
		Total : Average:							18.79 3.132		
P2	35	0	10:07:00	0	96753.08		0.00	0.00	0.00	c :	1
		1	10:08:00	01:00	96754.27		4.50	4.50	0.80		
		2	10:09:00	01:00	96755.41		4.32	4.32	0.77		
		3	10:12:00	03:00	96758.68		12.38	4.13	0.73		
		4	10:13:00	01:00	96759.75		4.05	4.05	0.72		
		5	10:14:00	01:00	96760.80		3.97	3.97	0.71		
		6	10:15:00	01:00	96761.85		3.97	3.97	0.71		
		7	10:16:00	01:00	96762.91		4.01	4.01	0.71		
		8									
		9									
		10									
		Total : Average:							28.96 4.137		
P3	47	0	10:17:00	0	96764.18		0.00	0.00	0.00	c :	1
		1	10:18:00	01:00	96765.48		4.92	4.92	0.87		
		2	10:19:00	01:00	96766.79		4.96	4.96	0.88		
		3	10:22:00	03:00	96770.73		14.91	4.97	0.88		
		4	10:23:00	01:00	96772.03		4.92	4.92	0.87		
		5	10:24:00	01:00	96773.34		4.96	4.96	0.88		
		6	10:25:00	01:00	96774.64		4.92	4.92	0.87		
		7	10:26:00	01:00	96775.96		5.00	5.00	0.89		
		8	10:27:00	01:00	96777.25		4.88	4.88	0.87		
		9									
		10									
		Total : Average:							39.53 4.942		
P4	34	0	10:28:00	0	96778.27		0.00	0.00	0.00	c :	1
		1	10:29:00	01:00	96779.20		3.52	3.52	0.63		
		2	10:30:00	01:00	96780.14		3.56	3.56	0.63		
		3	10:31:00	01:00	96781.07		3.52	3.52	0.63		
		4	10:33:00	02:00	96782.93		7.04	3.52	0.63		
		5	10:36:00	03:00	96785.68		10.41	3.47	0.62		
		6	10:37:00	01:00	96786.59		3.44	3.44	0.61		
		7	10:38:00	01:00	96787.52		3.52	3.52	0.63		
		8									
		9									
		10									
		Total : Average:							24.55 3.508		
P5	22	1	10:39:00	0	96788.27		0.00	0.00	0.00	c :	1
		2	10:40:00	01:00	96788.93		2.50	2.50	0.44		
		3	10:41:00	01:00	96789.60		2.54	2.54	0.45		
		4	10:42:00	01:00	96790.28		2.57	2.57	0.46		
		5	10:43:00	01:00	96790.94		2.50	2.50	0.44		
		6	10:45:00	02:00	96792.27		5.03	2.52	0.45		
		7	10:46:00	01:00	96792.92		2.46	2.46	0.44		
		8	10:47:00	01:00	96793.58		2.50	2.50	0.44		
		9	10:48:00	01:00	96794.23		2.46	2.46	0.44		
		10									
		11									
		Total : Average:							20.04 2.505		

## TEST RESULTS

Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	5.6	<div><div>Lugeon Value</div><div><div>0</div><div>10</div><div>20</div><div>30</div><div>40</div><div>50</div></div><div><div>Stage No.</div><div>P1</div><div>P2</div><div>P3</div><div>P4</div><div>P5</div></div></div> <td>23.5</td> <td rowspan="5"><div><div>Interval Pressure (psi)</div><div><div>0</div><div>50</div></div><div><div>Flow Rate (L/min)</div><div>6.00</div><div>5.00</div><div>4.00</div><div>3.00</div><div>2.00</div><div>1.00</div><div>0.00</div></div></div><td>4.9</td></td>	23.5	<div><div>Interval Pressure (psi)</div><div><div>0</div><div>50</div></div><div><div>Flow Rate (L/min)</div><div>6.00</div><div>5.00</div><div>4.00</div><div>3.00</div><div>2.00</div><div>1.00</div><div>0.00</div></div></div> <td>4.9</td>	4.9
P2	4.9		35.4		4.1
P3	4.4		46.9		3.5
P4	4.4		33.8		3.1
P5	4.7		22.5		2.5
Flow Type			Comments:		
LAMINAR FLOW					
Interpreted Result      5      uL					
Reported Permeability at Stage    Average					
K=      5.E-05      cm/sec					

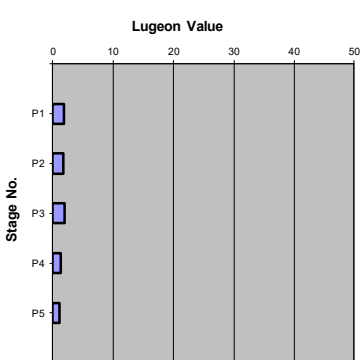
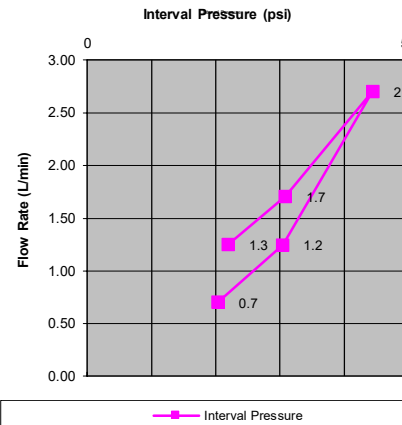




Immediately prior to test (ft bgs) :	16.54
Used in analysis (ft bgs) :	16.54
Pressure Gauge Height (ft ags) :	--
Assumed Water Temperature (C) :	20
Casing Inner Diameter (mm ) :	77.8
CW	Date : 5/1/2023

TEST RESULTS					
Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	1.9		21.3		Interpreted Result      2      uL
P2	2.4		34.0		Reported Permeability at Stage    Average
P3	2.2		50.0		K=      2.E-05      cm/sec
P4	2.4		30.4		
P5	2.2		20.8		
Flow Type					
LAMINAR FLOW			Comments:		



WATER PRESSURE TEST												
Job No. : GL1777449-Y9		Hole No. : BW-4		Drilling Method : HQ		Vertical depth to Groundwater		Revision : 0.0		0.0		
Client : Southern Co.		Dip (Deg) : -90		Hole Diameter (m) : 0.096				Immediately prior to test (ft bgs) : 22.39		22.39		
Project : McDonough Plant		Interval Top (ft) : 91.24		Tested Length (m) : 7.55				Pressure Gauge Height (ft ags) : --		--		
Location : Ash Pond 1		Interval Base (ft) : 116.00		Packer Type: Pneumatic - Wireline - Single				Presumed Water Temperature (C) : 20		20		
Tested By : R. Feldmann		Computed By : RJF		Rock tested : W1 to W3 Muscovite Biotite Schist				Casing Inner Diameter (mm ) : 77.8		77.8		
Date : 3/23/2023		Date : 4/25/2023		Water Meter Reading in US Gallon		Checked By : JCW		Date : 5/1/2023				
Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks		
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)			
			(h:m:s)	(min)	(US Gallon)							
P1	22	0	10:49:00	0	96,580.78		0.00	0.00	0.00	c : 1		
		1	10:50:00	01:00	96,581.19		1.55	1.45	0.19			
		2	10:51:00	01:00	96,581.53		1.29	1.18	0.16			
		3	10:52:00	01:00	96,581.90		1.40	1.30	0.17			
		4	10:54:00	02:00	96,582.59		2.61	1.20	0.16			
		5	10:59:00	05:00	96,584.21		6.13	1.12	0.15			
		6										
		7										
		8										
		9										
		10										
								Total :	6.26		0.83	Start Date & Time : 3/23/2023 10:14
								Average:	1.252		0.166	
P2	31	0	11:00:00	0	96,584.69		0.00	0.00	0.00	c : 1		
		1	11:01:00	01:00	96,585.21		1.97	1.80	0.24			
		2	11:04:00	03:00	96,586.74		5.79	1.76	0.23			
		3	11:08:00	04:00	96,588.68		7.34	1.66	0.22			
		4	11:09:00	01:00	96,589.15		1.78	1.61	0.21			
		5										
		6										
		7										
		8										
		9										
		10										
								Total :	6.83		0.90	
								Average:	1.707		0.226	
P3	44	0	11:10:00	0	96,590.00		0.00	0.00	0.00	c : 1		
		1	11:11:00	01:00	96,590.78		2.95	2.61	0.35			
		2	11:12:00	01:00	96,591.59		3.07	2.73	0.36			
		3	11:15:00	03:00	96,593.92		8.82	2.60	0.34			
		4	11:18:00	03:00	96,595.17		4.73	1.24	0.16			
		5	11:20:00	02:00	96,597.64		9.35	4.34	0.57			
		6										
		7										
		8										
		9										
		10										
								Total :	13.52		1.79	
								Average:	2.703		0.358	
P4	30	0	11:22:00	0	96,598.58		0.00	0.00	0.00	c : 1		
		1	11:23:00	01:00	96,598.86		1.06	0.92	0.12			
		2	11:24:00	01:00	96,599.25		1.48	1.33	0.18			
		3	11:25:00	01:00	96,599.63		1.44	1.29	0.17			
		4	11:26:00	01:00	96,600.01		1.44	1.29	0.17			
		5	11:28:00	02:00	96,600.77		2.88	1.29	0.17			
		6	11:29:00	01:00	96,601.15		1.44	1.29	0.17			
		7	11:30:00	01:00	96,601.53		1.44	1.29	0.17			
		8										
		9										
		10										
								Total :	8.72		1.16	
								Average:	1.246		0.165	
P5	20	1	11:31:00	0	96,601.77		0.00	0.00	0.00	c : 1		
		2	11:32:00	01:00	96,601.98		0.79	0.70	0.09			
		3	11:33:00	01:00	96,602.19		0.79	0.70	0.09			
		4	11:39:00	06:00	96,603.44		4.73	0.70	0.09			
		5	11:40:00	01:00	96,603.65		0.79	0.70	0.09			
		6										
		7										
		8										
		9										
		10										
		11										
								Total :	2.81		0.37	Finish Date & Time : 3/23/2023 0:10
								Average:	0.703		0.093	
TEST RESULTS												
Stage No.	Lugeon Value	Lugeon Value Curve			Interval Pressure	Pressure Vs Flow		Interpreted Result & Hydraulic Conductivity				
P1	1.8				22.0			Interpreted Result 2 uL				
P2	1.7				30.9							
P3	1.9				44.5							
P4	1.3				30.4							
P5	1.1				20.3							
Flow Type					Comments:							
LAMINAR FLOW												





Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						c :
P1	13	0	12:33:00	0	96653.07		0.00	0.00	0.00	0.16 L/min leak through stuffing box	1
		1	12:34:00	01:00	96653.19		0.45	0.29	0.05		
		2	12:35:00	01:00	96653.30		0.42	0.25	0.05		
		3	12:36:00	01:00	96653.40		0.38	0.21	0.04		
		4	12:38:00	02:00	96653.63		0.87	0.27	0.05		
		5	12:40:00	02:00	96653.84		0.79	0.23	0.04		
		6	12:41:00	01:00	96653.95		0.42	0.25	0.05		
		7	12:42:00	01:00	96654.06		0.42	0.25	0.05		
		8	12:43:00	01:00	96654.16		0.38	0.21	0.04		
		9									
		10									
		Total : Average:							1.98		
P2	22	0	12:44:00	0	96654.35		0.00	0.00	0.00	0.3 L/min leak through stuffing box	1
		1	12:45:00	01:00	96654.59		0.91	0.61	0.11		
		2	12:46:00	01:00	96654.80		0.79	0.49	0.09		
		3	12:47:00	01:00	96655.01		0.79	0.49	0.09		
		4	12:49:00	02:00	96655.45		1.67	0.53	0.10		
		5	12:50:00	01:00	96655.68		0.87	0.57	0.10		
		6	12:51:00	01:00	96655.89		0.79	0.49	0.09		
		7	12:52:00	01:00	96656.11		0.83	0.53	0.10		
		8	12:53:00	01:00	96656.34		0.87	0.57	0.10		
		9									
		10									
		Total : Average:							4.30		
P3	34	0	12:54:00	0	96656.74		0.00	0.00	0.00	0.48 L/min leak through stuffing box	1
		1	12:55:00	01:00	96657.19		1.70	1.22	0.22		
		2	12:56:00	01:00	96657.61		1.59	1.11	0.20		
		3	12:57:00	01:00	96658.04		1.63	1.15	0.21		
		4	12:58:00	01:00	96658.47		1.63	1.15	0.21		
		5	12:59:00	01:00	96658.90		1.63	1.15	0.21		
		6	13:00:00	01:00	96659.31		1.55	1.07	0.20		
		7	13:02:00	02:00	96660.18		3.29	1.17	0.21		
		8	13:03:00	01:00	96660.57		1.48	1.00	0.18		
		9									
		10									
		Total : Average:							9.01		
P4	22	0	13:04:00	0	96660.81		0.00	0.00	0.00	0.23 L/min leak through stuffing box	1
		1	13:05:00	01:00	96660.99		0.68	0.46	0.08		
		2	13:06:00	01:00	96661.17		0.68	0.46	0.08		
		3	13:07:00	01:00	96661.36		0.72	0.49	0.09		
		4	13:08:00	01:00	96661.54		0.68	0.46	0.08		
		5	13:09:00	01:00	96661.72		0.68	0.46	0.08		
		6	13:10:00	01:00	96661.91		0.72	0.49	0.09		
		7	13:12:00	02:00	96662.28		1.40	0.48	0.09		
		8	13:13:00	01:00	96662.46		0.68	0.46	0.08		
		9	13:14:00	01:00	96662.65		0.72	0.49	0.09		
		10									
								Total : Average:			
P5	12	1	13:17:00	0	96662.82		0.00	0.00	0.00	0.12 L/min leak through stuffing box	1
		2	13:18:00	01:00	96662.86		0.15	0.03	0.01		
		3	13:19:00	01:00	96662.91		0.19	0.07	0.01		
		4	13:22:00	03:00	96663.08		0.64	0.09	0.02		
		5	13:23:00	01:00	96663.13		0.17	0.05	0.01		
		6	13:24:00	01:00	96663.18		0.21	0.09	0.02		
		7	13:25:00	01:00	96663.23		0.19	0.07	0.01		
		8									
		9									
		10									
		11									
		Total : Average:							0.40		

Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	0.8		13.0		Interpreted Result      1      uL
P2	1.1		22.1		<div>Reported Permeability at Stage P2 and P4</div> <div>K=      1.E-05      cm/sec</div>
P3	1.5		33.6		
P4	0.9		22.4		
P5	0.2		12.3		
Flow Type					
DILATION		Comments:			





Revision : 0.0

Job No. :	GL1777449-Y9	Hole No :	BW-5	Drilling Method :	HQ	Vertical depth to Groundwater	Immediately prior to test (ft bgs) :	5.09
Client :	Southern Co.	Dip (Deg) :	-90	Hole Diameter (m) :	0.096		Used in analysis (ft bgs) :	5.09
Project :	McDonough Plant	Interval Top (ft) :	26.21	Tested Length (m) :	13.66		Pressure Gauge Height (ft ags) :	--
Location :	Ash Pond 1	Interval Base (ft) :	71.00	Packer Type:	Pneumatic - Wireline - Single		Presumed Water Temperature (C) :	16
Tested By :	C. Mikilitus	Computed By :	RJF	Rock tested :	W2 Gneiss and W2 Muscovite Biotite Schist		Casing Inner Diameter (mm ) :	77.8
Date :	3/8/2023	Date :	4/26/2023	Water Meter Reading in US Gallon		Checked By :	JCW	Date : 5/1/2023

Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						c :
P1	17	0	7:33:00	0	94487.70		0.00	0.00	0.00	c :	1
		1	7:34:00	01:00	94488.22		1.97	1.97	0.14		
		2	7:35:00	01:00	94488.71		1.85	1.85	0.14		
		3	7:38:00	03:00	94490.08		5.19	1.73	0.13		
		4	7:39:00	01:00	94490.49		1.55	1.55	0.11		
		5	7:40:00	01:00	94490.93		1.67	1.67	0.12		
		6	7:41:00	01:00	94491.38		1.70	1.70	0.12		
		7	7:42:00	01:00	94491.84		1.74	1.74	0.13		
		8	7:43:00	01:00	94492.23		1.48	1.48	0.11		
		9									
		10									
		Total :							13.69		
Average:							1.711	0.125			
P2	33	0	7:44:00	0	94492.93		0.00	0.00	0.00	c :	1
		1	7:45:00	01:00	94493.61		2.57	2.57	0.19		
		2	7:46:00	01:00	94494.27		2.50	2.50	0.18		
		3	7:47:00	01:00	94494.84		2.16	2.16	0.16		
		4	7:48:00	01:00	94495.58		2.80	2.80	0.21		
		5	7:50:00	02:00	94496.86		4.85	2.42	0.18		
		6	7:51:00	01:00	94497.51		2.46	2.46	0.18		
		7	7:53:00	02:00	94498.73		4.62	2.31	0.17		
		8									
		9									
		10									
		Total :							17.22		
Average:							2.461	0.180			
P3	49	0	7:54:00	0	94499.57		0.00	0.00	0.00	c :	1
		1	7:55:00	01:00	94500.38		3.07	3.07	0.22		
		2	7:56:00	01:00	94501.18		3.03	3.03	0.22		
		3	7:57:00	01:00	94501.92		2.80	2.80	0.21		
		4	7:59:00	02:00	94503.46		5.83	2.91	0.21		
		5	8:00:00	01:00	94504.20		2.80	2.80	0.21		
		6	8:01:00	01:00	94504.92		2.73	2.73	0.20		
		7	8:02:00	01:00	94505.63		2.69	2.69	0.20		
		8	8:03:00	01:00	94506.35		2.73	2.73	0.20		
		9									
		10									
		Total :							22.75		
Average:							2.844	0.208			
P4	32	0	8:05:00	0	94507.44		0.00	0.00	0.00	c :	1
		1	8:06:00	01:00	94507.98		2.04	2.04	0.15		
		2	8:07:00	01:00	94508.52		2.04	2.04	0.15		
		3	8:09:00	02:00	94509.63		4.20	2.10	0.15		
		4	8:10:00	01:00	94510.18		2.08	2.08	0.15		
		5	8:11:00	01:00	94510.72		2.04	2.04	0.15		
		6	8:12:00	01:00	94511.26		2.04	2.04	0.15		
		7	8:13:00	01:00	94511.82		2.12	2.12	0.16		
		8									
		9									
		10									
		Total :							14.48		
Average:							2.068	0.151			
P5	17	1	8:14:00	0	94512.15		0.00	0.00	0.00	c :	1
		2	8:15:00	01:00	94512.38		0.87	0.87	0.06		
		3	8:16:00	01:00	94512.61		0.87	0.87	0.06		
		4	8:17:00	01:00	94512.84		0.87	0.87	0.06		
		5	8:18:00	01:00	94513.07		0.87	0.87	0.06		
		6	8:19:00	01:00	94513.30		0.87	0.87	0.06		
		7	8:20:00	01:00	94513.53		0.87	0.87	0.06		
		8	8:21:00	01:00	94513.76		0.87	0.87	0.06		
		9	8:22:00	01:00	94513.98		0.83	0.83	0.06		
		10	8:23:00	01:00	94514.20		0.83	0.83	0.06		
		11									
		Total :							7.76		
Average:							0.862	0.063			

## TEST RESULTS

Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	1.7		17.2		Interpreted Result      1      uL
P2	1.3		32.9		Reported Permeability at Stage P2 through P5
P3	1.0		48.5		K=      1.E-05      cm/sec
P4	1.1		32.3		
P5	0.9		17.3		
Flow Type					
LAMINAR FLOW		Comments: Void filling during the first step.			





Revision : 0.0

Job No. :	GL1777449-Y9	Hole No. :	BW-5	Drilling Method :	HQ	Vertical depth to Groundwater	Immediately prior to test (ft bgs) :	-1.30
Client :	Southern Co.	Dip (Deg) :	-90	Hole Diameter (m) :	0.096		Used in analysis (ft bgs) :	-1.30
Project :	McDonough Plant	Interval Top (ft) :	54.10	Tested Length (m) :	5.15		Pressure Gauge Height (ft ags) :	--
Location :	Ash Pond 1	Interval Base (ft) :	71.00	Packer Type:	Pneumatic - Wireline - Single		Presumed Water Temperature (C) :	19
Tested By :	C. Mikilitus	Computed By :	RJF	Rock tested :	W2 Muscovite Biotite Schist		Casing Inner Diameter (mm ) :	77.8
Date :	3/7/2023	Date :	4/26/2023	Water Meter Reading in US Gallon		Checked By :	JCW	Date : 5/1/2023

Pressure Stage	Interval Pressure (PSI)	No	Actual	Time	Water Meter Readings		Volume	Discharge	Discharge/m	Remarks	
			Time	Intervals	Reading		(L)	(L/min)	(L/min/m)		
			(h:m:s)	(min)	(US Gallon)						c :
P1	12	0	15:44:00	0	94455.83		0.00	0.00	0.00	c :	1
		1	15:45:00	01:00	94456.28		1.70	1.70	0.33		
		2	15:46:00	01:00	94456.56		1.06	1.06	0.21		
		3	15:48:00	02:00	94457.10		2.04	1.02	0.20		
		4	15:49:00	01:00	94457.38		1.06	1.06	0.21		
		5	15:50:00	01:00	94457.65		1.02	1.02	0.20		
		6	15:51:00	01:00	94457.92		1.02	1.02	0.20		
		7	15:52:00	01:00	94458.19		1.02	1.02	0.20		
		8									
		9									
		10									
		Total :							7.91		
Average:							1.130	0.219			
P2	25	0	15:54:00	0	94459.04		0.00	0.00	0.00	c :	1
		1	15:55:00	01:00	94459.45		1.55	1.55	0.30		
		2	15:56:00	01:00	94459.86		1.55	1.55	0.30		
		3	15:58:00	02:00	94460.65		2.99	1.50	0.29		
		4	16:00:00	02:00	94461.44		2.99	1.50	0.29		
		5	16:02:00	02:00	94462.25		3.07	1.53	0.30		
		6									
		7									
		8									
		9									
		10									
		Total :							7.63		
Average:							1.526	0.296			
P3	42	0	16:05:00	0	94464.05		0.00	0.00	0.00	c :	1
		1	16:06:00	01:00	94464.64		2.23	2.23	0.43		
		2	16:08:00	02:00	94465.77		4.28	2.14	0.42		
		3	16:09:00	01:00	94466.33		2.12	2.12	0.41		
		4	16:10:00	01:00	94466.88		2.08	2.08	0.40		
		5	16:11:00	01:00	94467.46		2.20	2.20	0.43		
		6	16:13:00	02:00	94468.53		4.05	2.03	0.39		
		7									
		8									
		9									
		10									
		Total :							12.79		
Average:							2.132	0.414			
P4	26	0	16:14:00	0	94468.96		0.00	0.00	0.00	c :	1
		1	16:15:00	01:00	94469.31		1.32	1.32	0.26		
		2	16:16:00	01:00	94469.68		1.40	1.40	0.27		
		3	16:17:00	01:00	94470.06		1.44	1.44	0.28		
		4	16:18:00	01:00	94470.43		1.40	1.40	0.27		
		5	16:21:00	03:00	94471.56		4.28	1.43	0.28		
		6	16:22:00	01:00	94471.93		1.40	1.40	0.27		
		7	16:23:00	01:00	94472.31		1.44	1.44	0.28		
		8	16:24:00	01:00	94472.68		1.40	1.40	0.27		
		9	16:25:00	01:00	94473.05		1.40	1.40	0.27		
		10	16:26:00	01:00	94473.42		1.40	1.40	0.27		
		Total :							14.03		
Average:							1.403	0.272			
P5	11	1	16:30:00	0	94474.66		0.00	0.00	0.00	c :	1
		2	16:31:00	01:00	94474.84		0.68	0.68	0.13		
		3	16:32:00	01:00	94475.03		0.72	0.72	0.14		
		4	16:33:00	01:00	94475.22		0.72	0.72	0.14		
		5	16:34:00	01:00	94475.41		0.72	0.72	0.14		
		6	16:35:00	01:00	94475.60		0.72	0.72	0.14		
		7	16:36:00	01:00	94475.79		0.72	0.72	0.14		
		8	16:37:00	01:00	94475.98		0.72	0.72	0.14		
		9	16:38:00	01:00	94476.18		0.76	0.76	0.15		
		10	16:39:00	01:00	94476.38		0.76	0.76	0.15		
		11	16:41:00	02:00	94476.74		1.36	0.68	0.13		
		Total :							7.19		
Average:							0.719	0.140			

## TEST RESULTS

Stage No.	Lugeon Value	Lugeon Value Curve	Interval Pressure	Pressure Vs Flow	Interpreted Result & Hydraulic Conductivity
P1	4.4		11.8		Interpreted Result      2      uL
P2	2.8		25.0		Reported Permeability at Stage P3  K=      2.E-05      cm/sec
P3	2.3		42.4		
P4	2.5		26.1		
P5	3.1		10.8		
Flow Type					
TURBULENT FLOW		Comments:			



**APPENDIX B**

## HydroBench Analysis Outputs



## HYDROBENCH REPORT

Project McDonough  
Site Ash Pond 1  
Source Well BW-2  
Test Name BW-2(62-80)CRI  
Test Date/Time 3/14/2023, 1309  
Interval top: 34.80 ft bottom: 80.25 ft

### Basic Data

Test Interval 45.45 ft  
Porosity 0.10  
Well Radius 0.158 ft Tubing Radius  
Inclination 0.0 deg  
Test Volume 26.496 gal (US)  
Well Type Source

### Fluid Properties

Viscosity 0.001 Pa\*s  
Density 1000.0 kg/m<sup>3</sup>  
Compressibility 2.0e-09 1/Pa

### History Definition

Name	Category	Duration [min]	P(o) [psi]	Rate [gpm]	C [ft <sup>3</sup> /psi]	Skin
Auto_History	Const. Pressure	5.00	33.16			0.00

### Sequence Definition

Name	Category	t(o) [min]	P(o) [psi]	P(i) [psi]	Rate [gpm]	C [ft <sup>3</sup> /psi]
PSR	Recovery	0.00000	33.16			2.2e-01
CRI-1.27	Constant Rate	14.00000	33.09		-1.27e+00	1.8e-01
CRIR	Recovery	29.00000	39.57			1.8e-01



Analysis Results

Analysis "CRI"

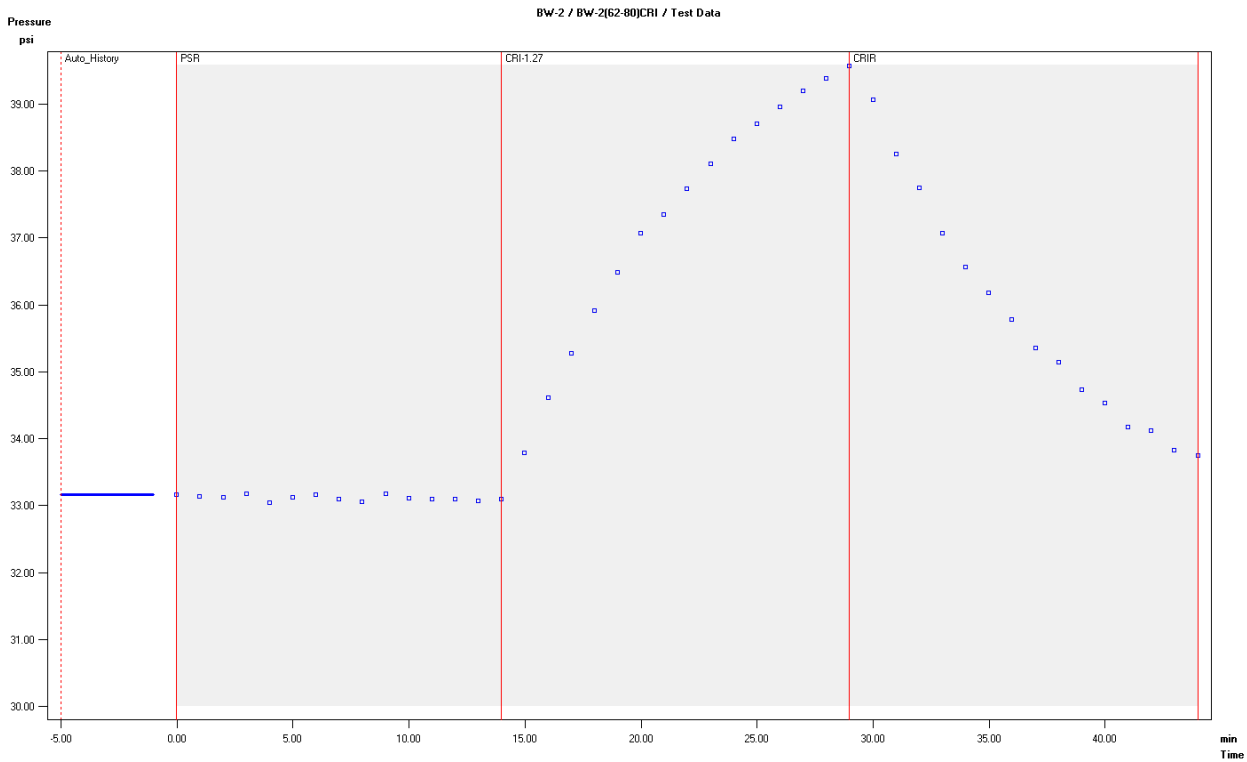
Static Pressure: 30.45 psi

Shell Parameters:

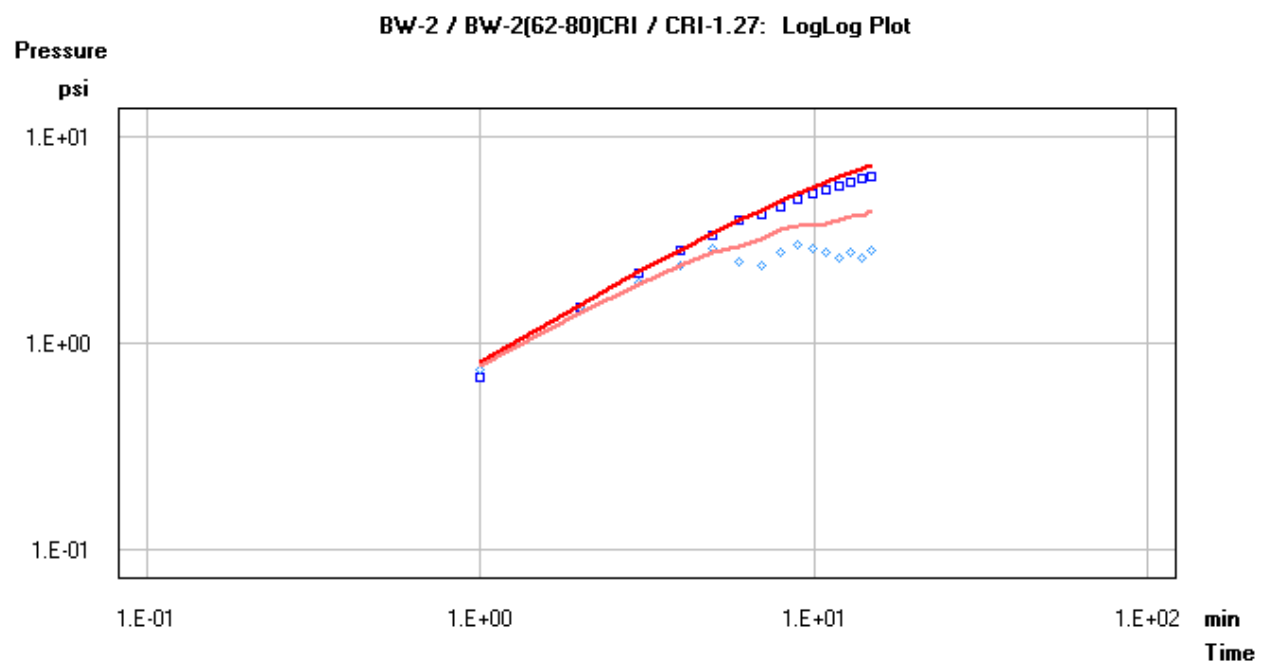
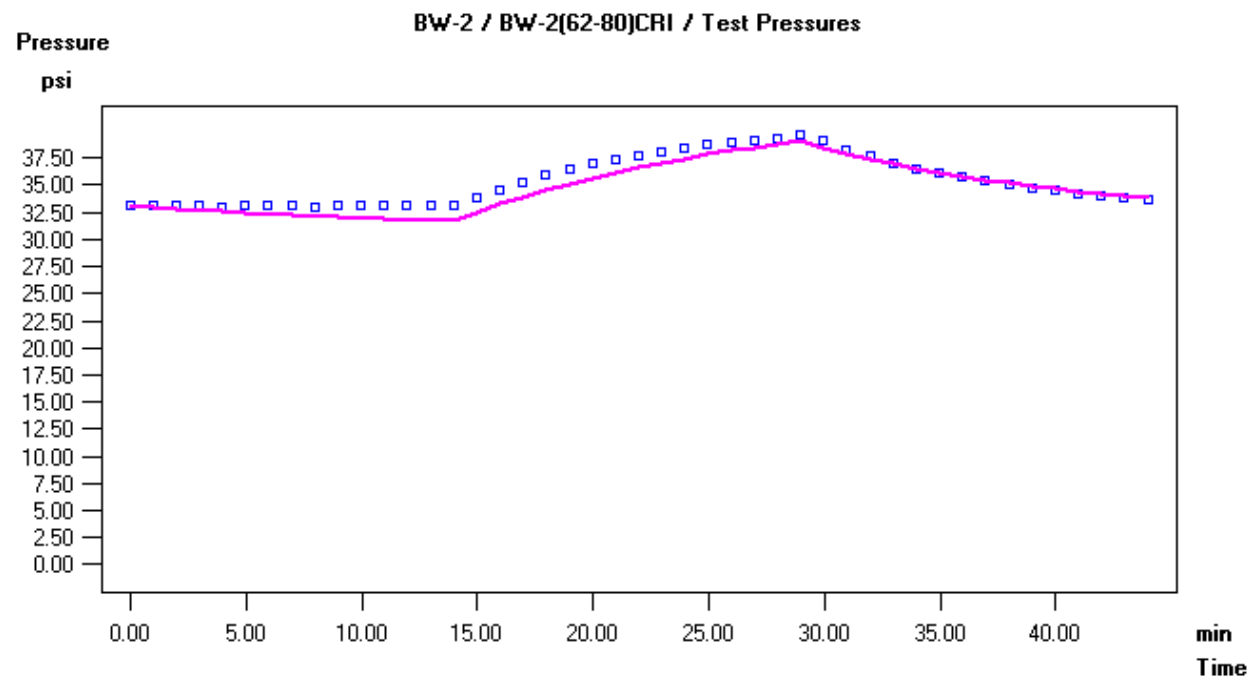
Name	Transmissivity [m²/s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	9.5e-06	1.1e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [ft³/psi]	Skin [-]
PSR	9.0e-07	0.0
CRI-1.27	7.4e-07	0.0
CRIR	7.4e-07	0.0

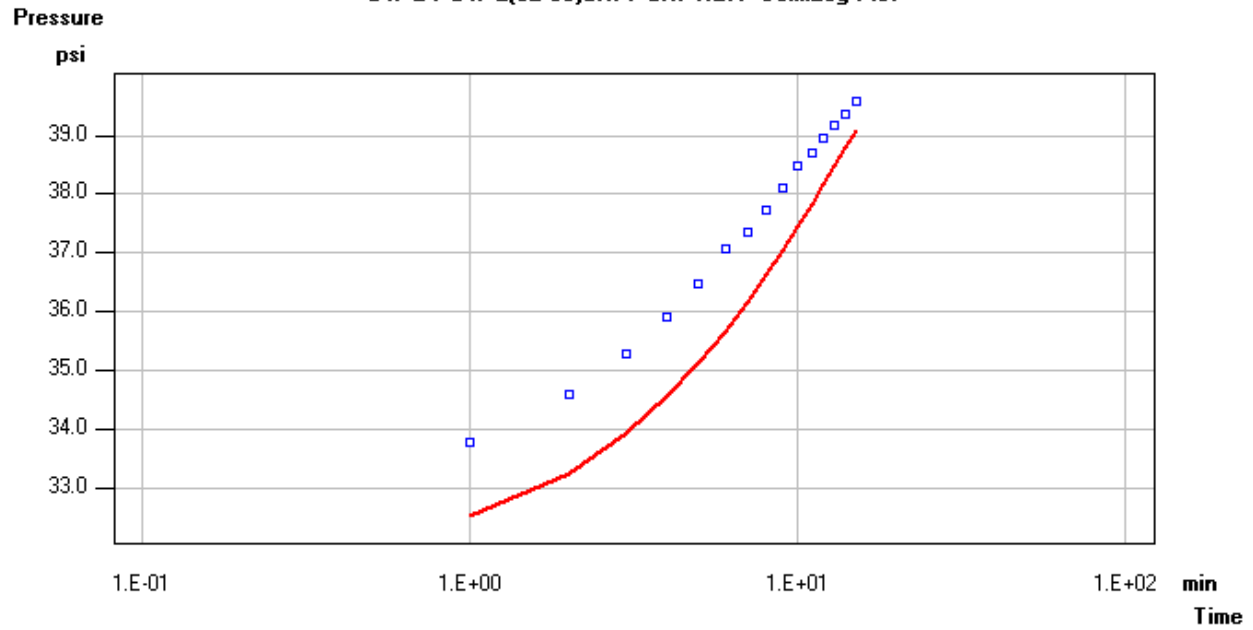




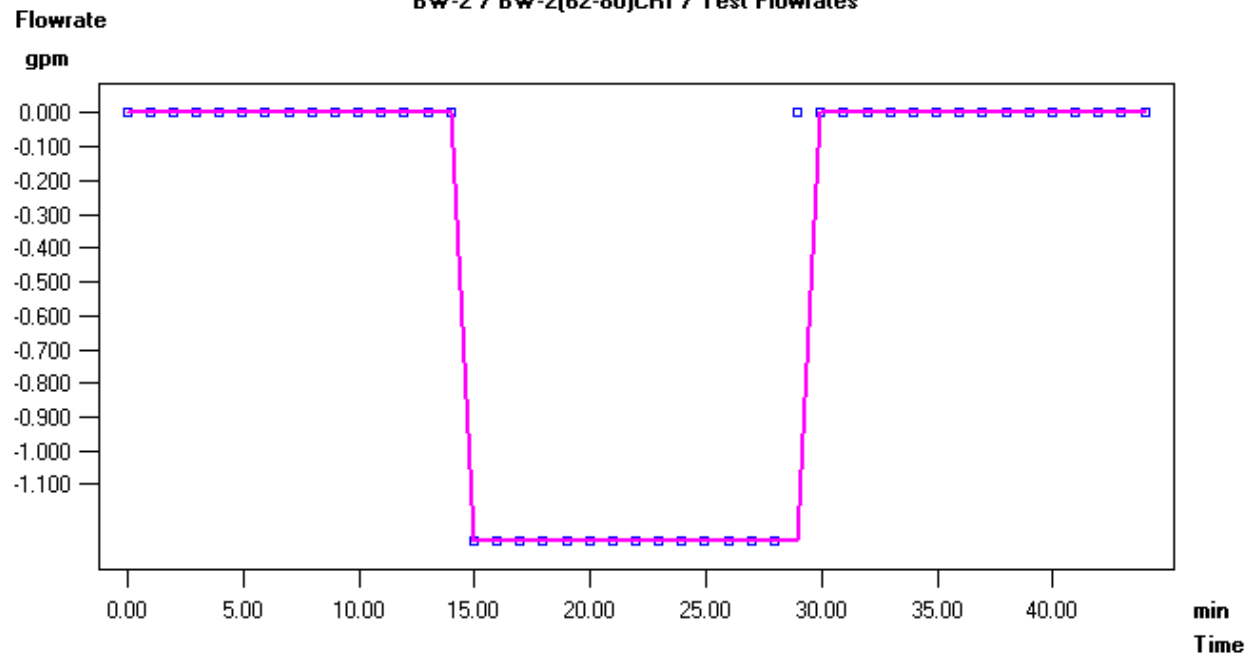




BW-2 / BW-2(62-80)CRI / CRI-1.27: SemiLog Plot

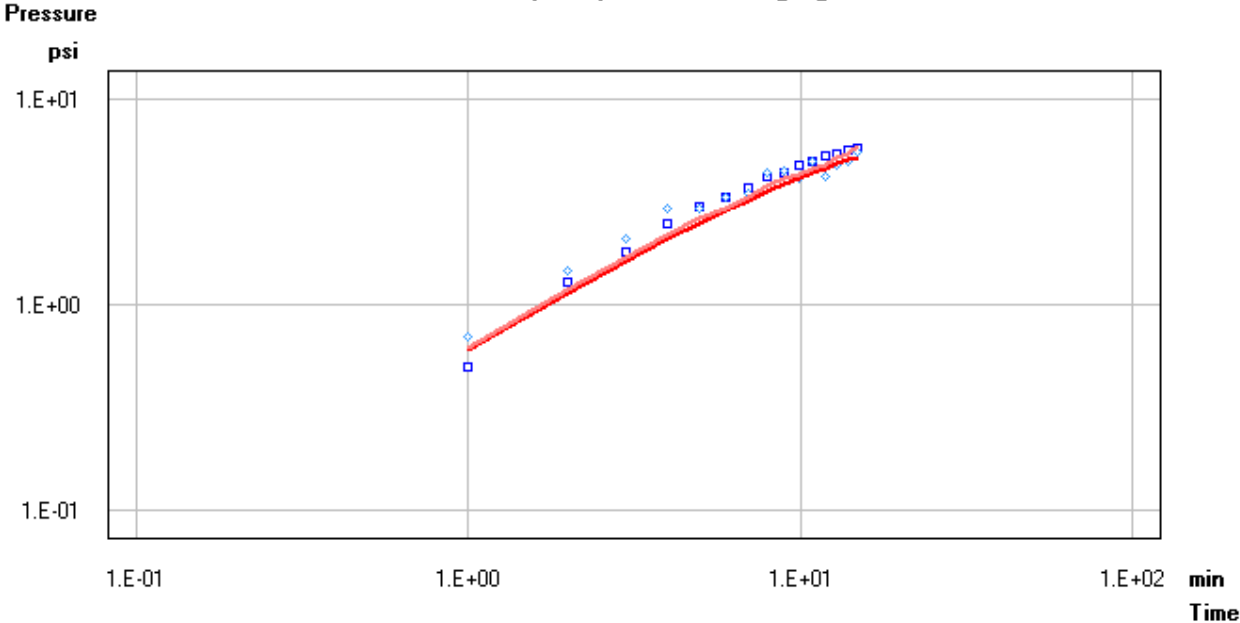


BW-2 / BW-2(62-80)CRI / Test Flowrates

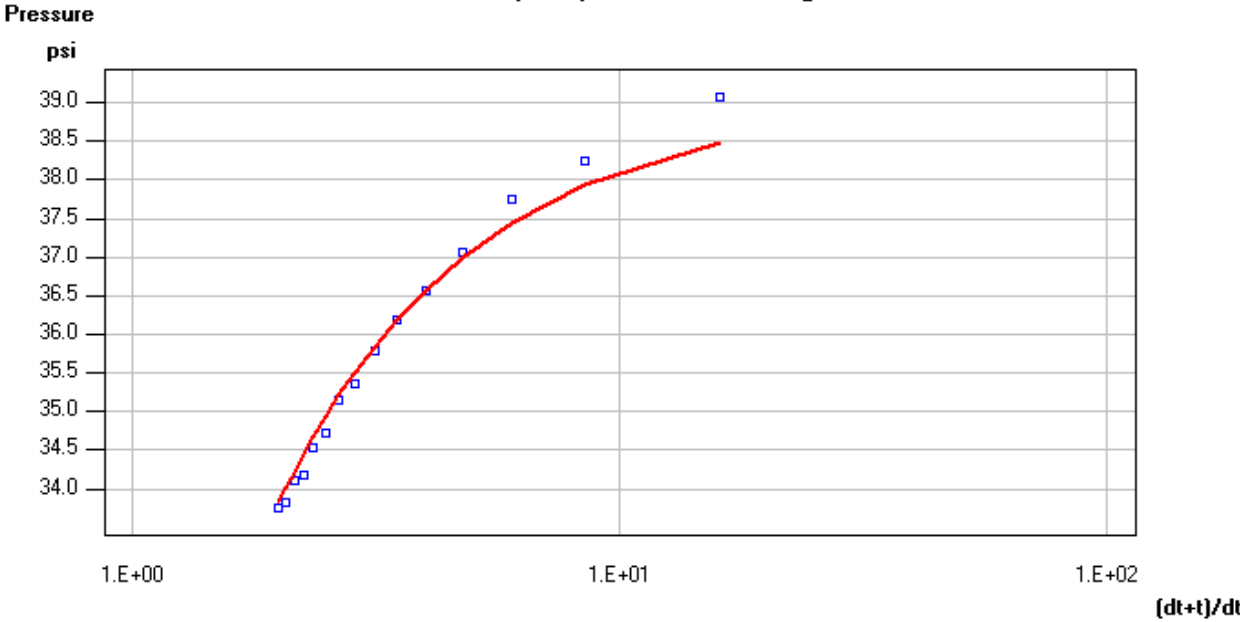




BW-2 / BW-2(62-80)CRI / CRIR: LogLog Plot



BW-2 / BW-2(62-80)CRI / CRIR: SemiLog Plot





## HYDROBENCH REPORT

Project McDonough  
Site Ash Pond 1  
Source Well BW-5  
Test Name BW-5(SWL-25)  
Test Date/Time 3/7/2023, 0800  
Interval top: 8.32 ft bottom: 25.00 ft  
Description PWR starts between 10.5 and 11 ft bgs

### Basic Data

Test Interval 16.68 ft  
Porosity 0.10  
Well Radius 0.203 ft                      Tubing Radius 0.043 ft  
Inclination 0.0 deg  
Test Volume 16.169 gal (US)  
Well Type Source

### Fluid Properties

Viscosity 0.001 Pa\*s  
Density 1000.0 kg/m<sup>3</sup>  
Compressibility 2.0e-09 1/Pa

### History Definition

Name	Category	Duration [min]	P(o) [psi]	Rate [gpm]	C [ft <sup>3</sup> /psi]	Skin
Auto_History	Const. Pressure	17.00	21.25			0.00

### Sequence Definition

Name	Category	t(o) [min]	P(o) [psi]	P(i) [psi]	Rate [gpm]	C [ft <sup>3</sup> /psi]
PSR	Recovery	0.00000	21.25			3.0e-01
SW-Init	dP-Event	18.00000	21.26	3.8 *		3.0e-01
SW1	Slug	20.00000	17.48	21.3		3.0e-01



Analysis Results

Analysis "SW1"

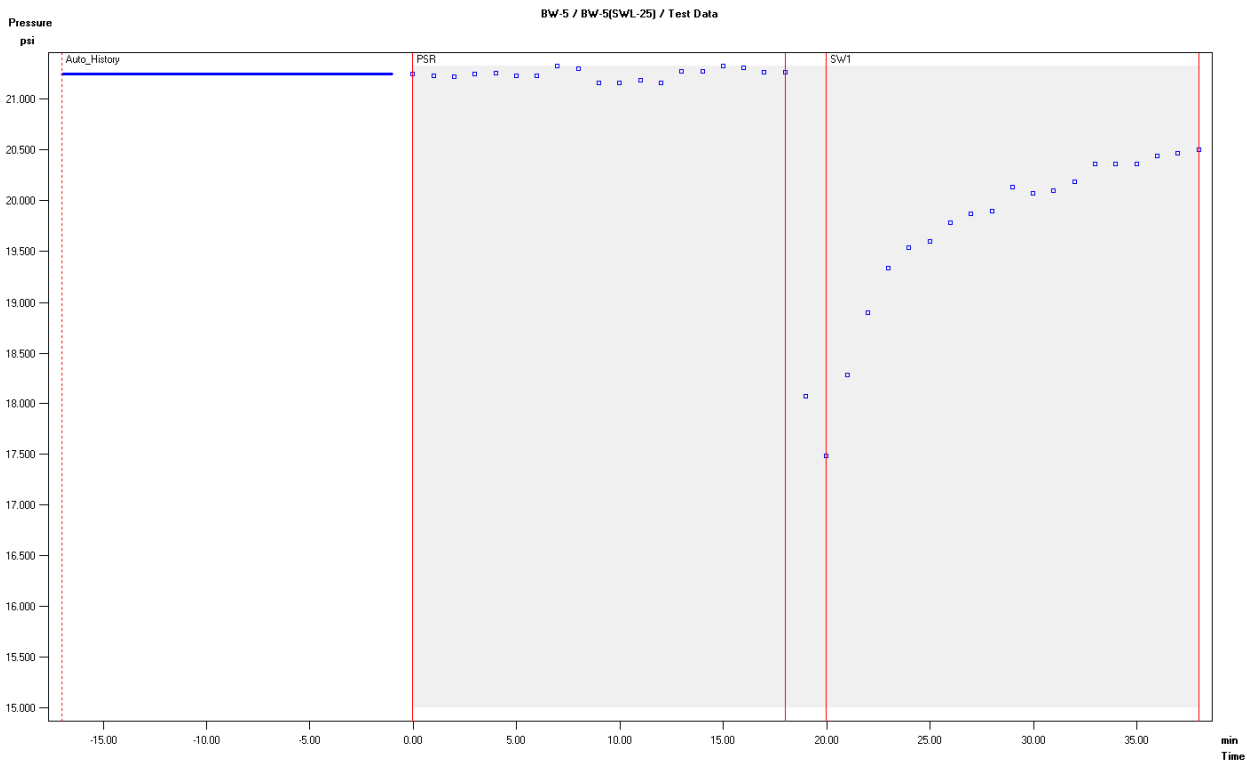
Static Pressure: 21.23 psi

Shell Parameters:

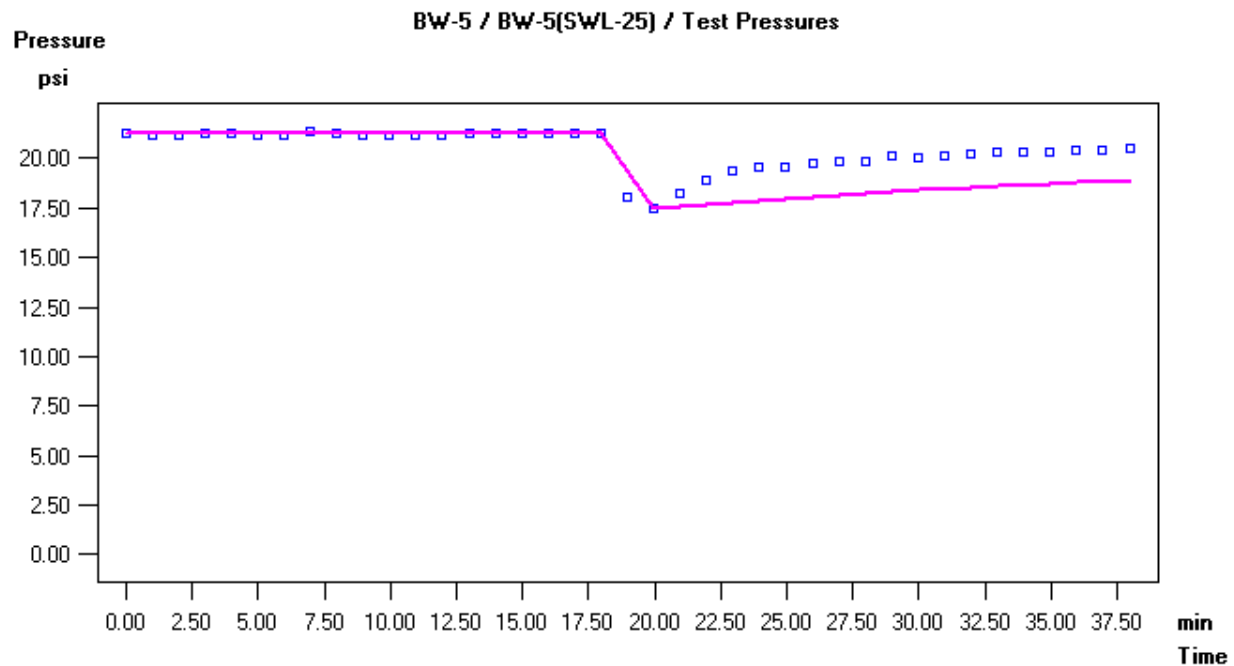
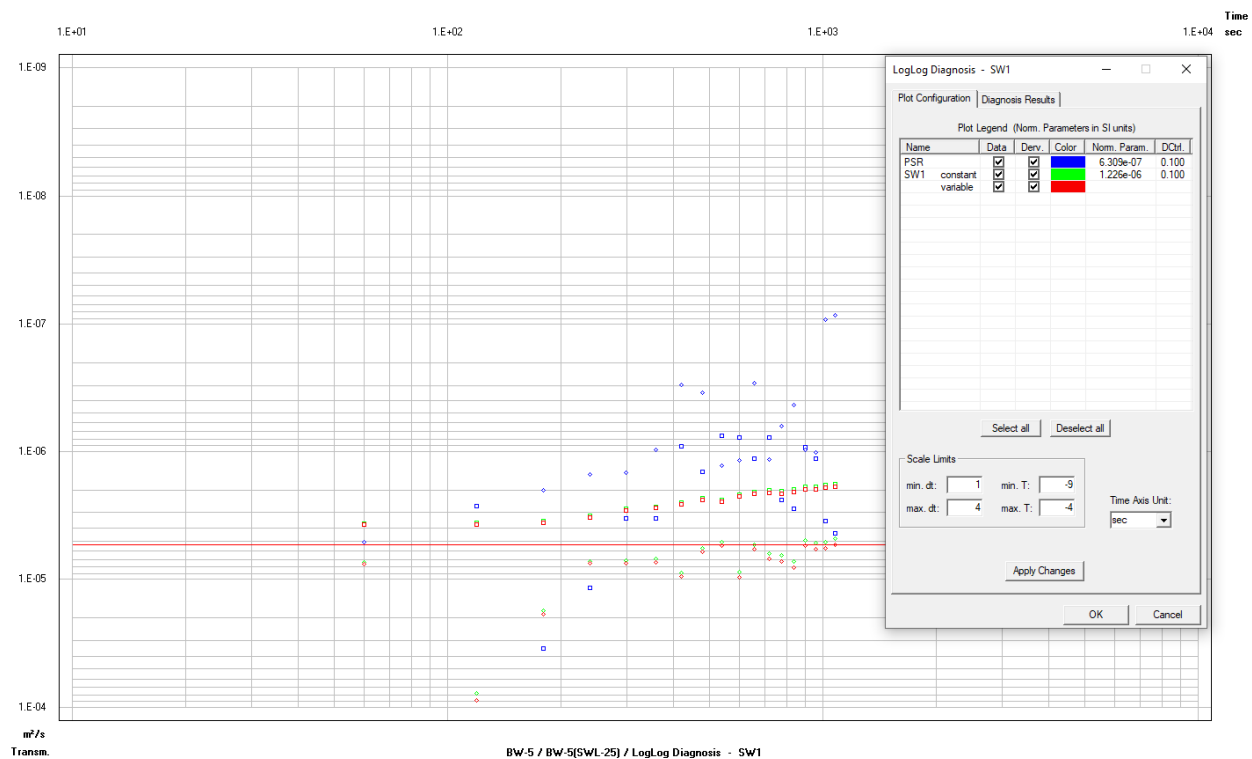
Name	Transmissivity [m²/s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	5.4e-06	6.0e-06	--	2.0

Sequence Parameters:

Name	Wellbore Storage [ft³/psi]	Skin [-]
PSR	1.2e-06	0.0
SW-Init	1.2e-06	0.0
SW1	1.2e-06	0.0

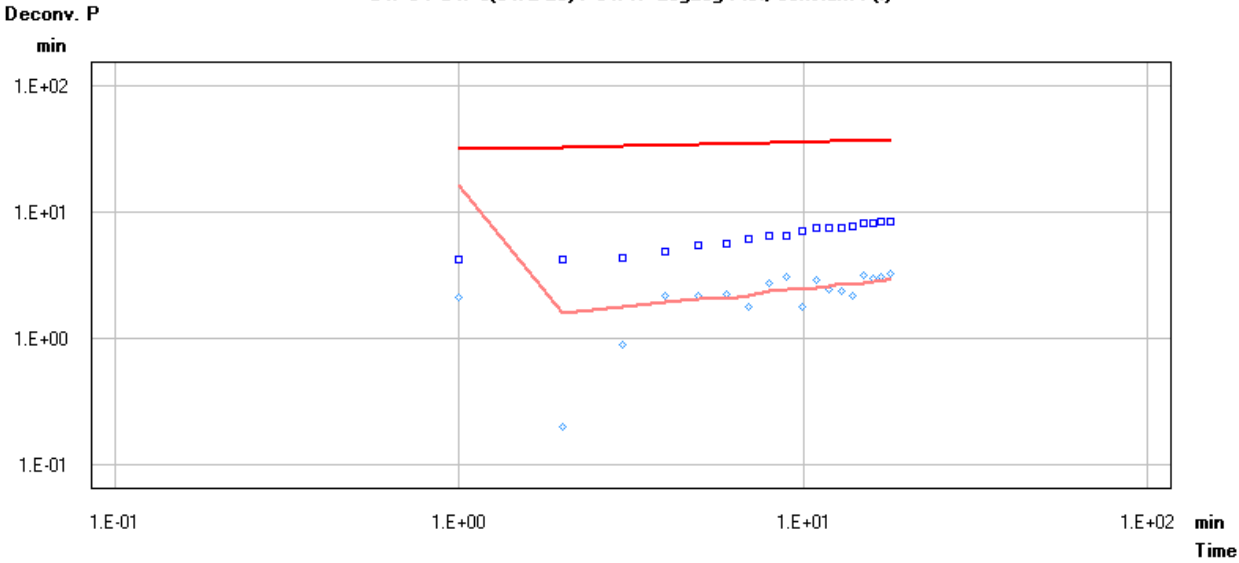




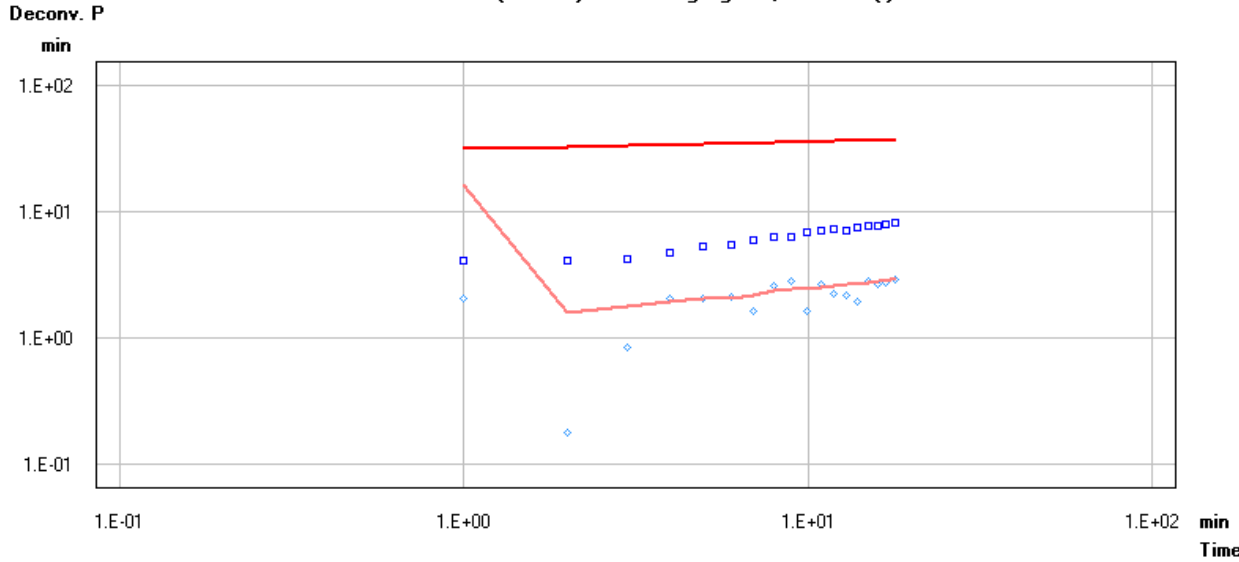




BW-5 / BW-5(SWL-25) / SW1: LogLog Plot, constant P(i)



BW-5 / BW-5(SWL-25) / SW1: LogLog Plot, variable P(i)





## **APPENDIX G**

# Combined Geophysical and Hydrogeological Drillhole Logs





Preliminary

Project Title: Plant McDonough Permitting Support AP-1 Investigation

Client: Georgia Power

Geophysical Record of Borehole: BW-1

Project Number: GL1777449-Y9

Date: May 17, 2023

Location: Plant McDonough AP-1



Driller: Premier

Casing Material: PVC

GS Elevation: 787.44 (feet NAVD 88)

Drill Method.: Mud rotary & HQ core

Casing Depth: 42 ft bgs

Easting: 2200838.18

Casing Dia.: 4 in

Casing Stick-up: 0.25 ft ags

Northing: 1391132.95

Drill Date: March 10, 2023

Drilled Depth: 93 ft

Coord. Sys.: GA ST Plane West (ft NAD83)

Water Level: 32.05' BTC

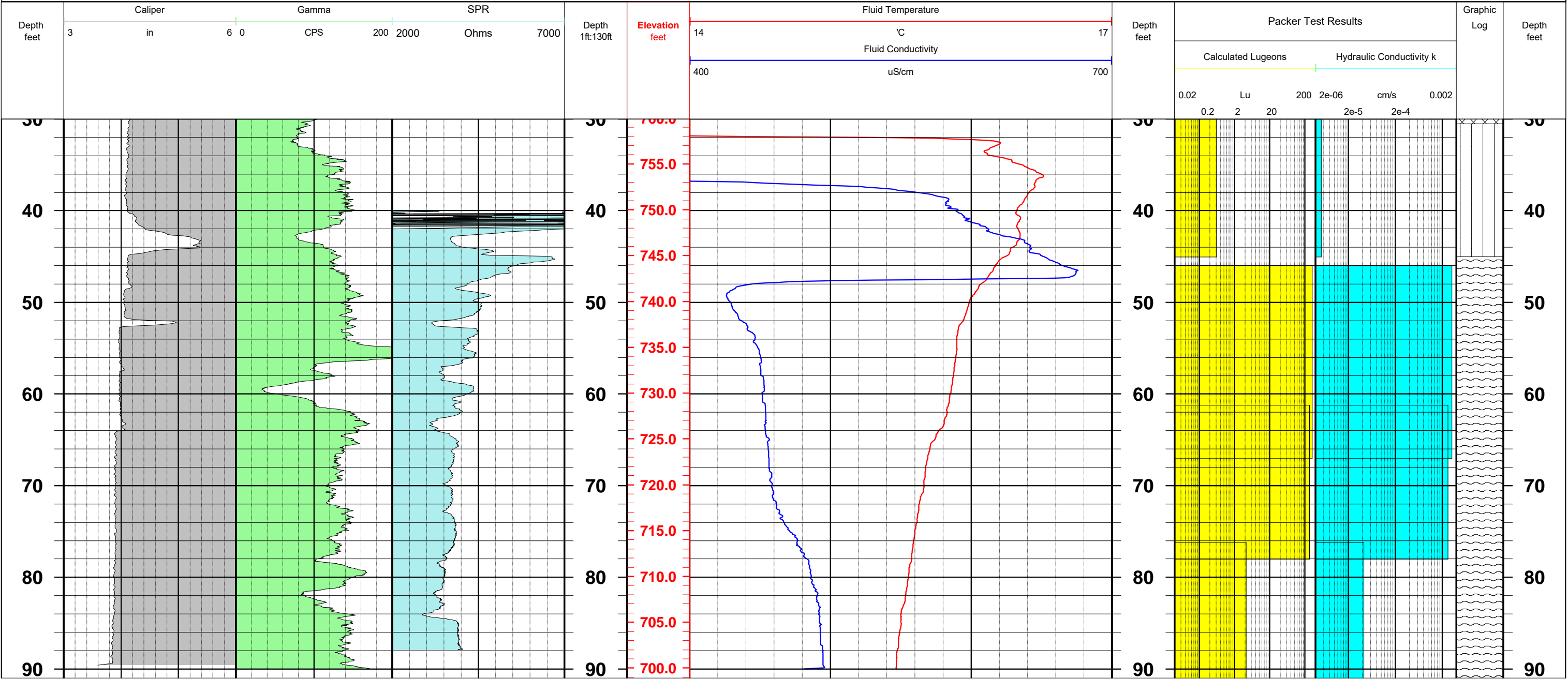
Borehole Incl.: vertical

Borehole Az.: na

Log Date: March 20, 2023

Logged By: Chris Bryant and Geoff Busby

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing. Auger refusal at 45.0 ft, assumed top of rock. PVC casing grouted in place.







Preliminary

Project Title: Plant McDonough Permitting Support AP-1 Investigation

Client: Georgia Power

Geophysical Record of Borehole: BW-2

Project Number: GL1777449-Y9

Date: May 17, 2023

Location: Plant McDonough AP-1



Driller: Premier

Casing Material: PVC

GS Elevation: 789.8 (feet NAVD 88)

Drill Method.: Mud rotary & HQ core

Casing Depth: 59 ft bgs

Easting: 2201056.5

Casing Dia.: 4 in

Casing Stick-up: see notes

Coord. Sys.: GA ST Plane West (ft NAD83)

Drill Date: March 10, 2023

Drilled Depth: 110 ft

Water Level: see notes

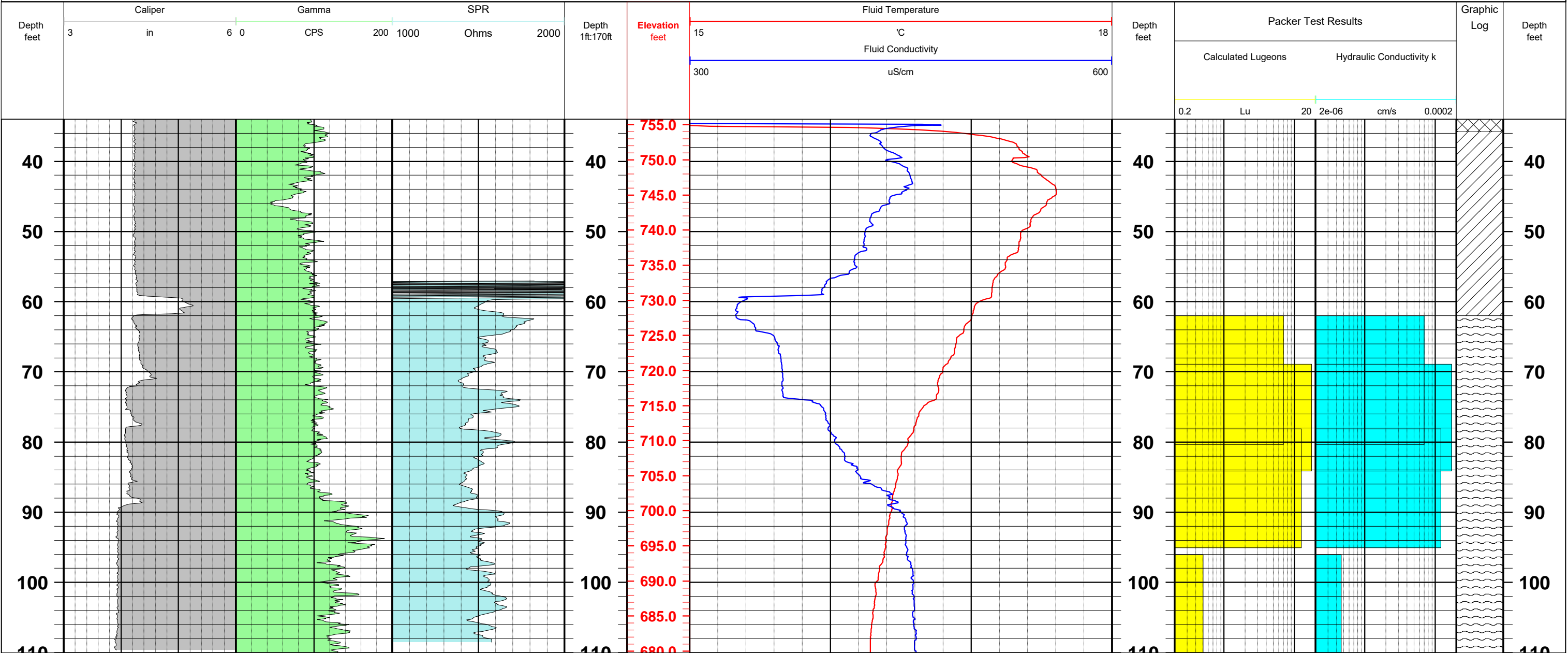
Borehole Incl.: vertical

Borehole Az.: na

Log Date: 3-21-2023 and 4-11-2023

Logged By: Chris Bryant and Geoff Busby

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing. The casing stick-up on 3-21-23 was 0.25 ft ags and was below GS on 4-11-2023. Water levels were 35.09' BTC @ 9:07 on 3-21-23 and 34.05' BTC @ 9:18 on 4-11-23. Auger refusal at 62.0 ft, assumed top of rock. PVC casing grouted in place.







**Client:** Georgia Power

**Location:** Plant McDonough AP-1

**Borehole Az.:** na





Preliminary

Project Title: Plant McDonough Permitting Support AP-1 Investigation

Client: Georgia Power

Geophysical Record of Borehole: BW-4

Project Number: GL1777449-Y9

Date: May 17, 2023

Location: Plant McDonough AP-1



Driller: Premier

Casing Material: PVC

GS Elevation: 797.05 (feet NAVD 88)

Drill Method.: Mud rotary & HQ core

Casing Depth: 77 ft bgs

Easting: 2201755.32

Casing Dia.: 4 in

Casing Stick-up: 0.0 ft ags

Northing: 1391306.59

Drill Date: March 22, 2023

Drilled Depth: 131 ft

Coord. Sys.: GA ST Plane West (ft NAD83)

Water Level: 20.53' BGS @ 13:10

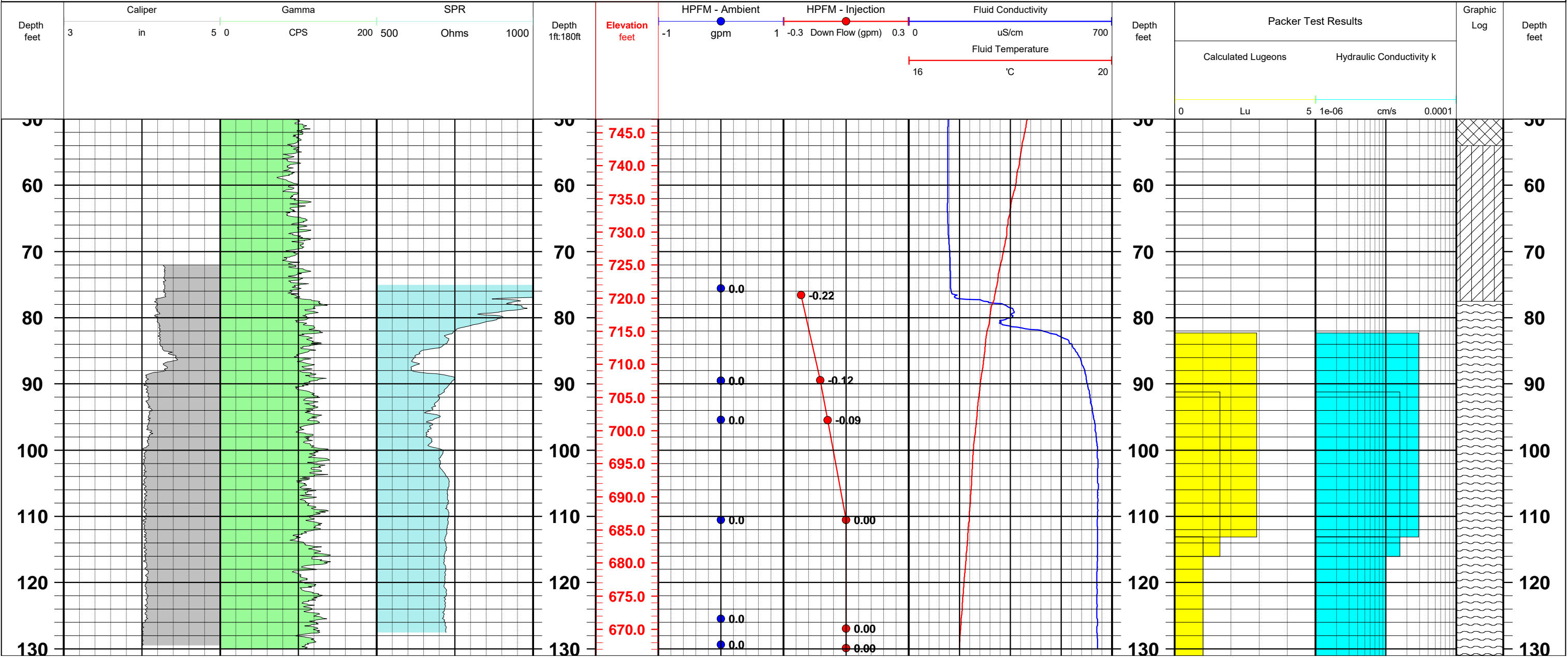
Borehole Incl.: vertical

Borehole Az.: na

Log Date: April 10, 2023

Logged By: Chris Bryant

Notes: All tools were zeroed with the probe top at TOC, and depth referenced to ground surface during processing. Auger refusal at 77.5 ft, assumed top of rock. PVC casing grouted in place. The HPFM was run under ambient conditions and under stressed (injection). No ambient flow was measured. The injection rate was 1 gpm. Injection started at 15:46 with the water level at 20.53 ft bgs and ended at 16:16 with water flowing out of the TOC.







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APPENDIX B

# Three-Dimensional Numerical Groundwater Model Summary Report

## Three-Dimensional Numerical Groundwater Model Summary Report Addendum





# Appendix A-Three-Dimensional Numerical Groundwater Modeling Summary Report

*Georgia Power- Plant McDonough, Cobb County, Georgia*

Submitted to:

**Georgia Power**

Environmental Affairs  
241 Ralph McGill Boulevard  
Atlanta, Georgia 30308

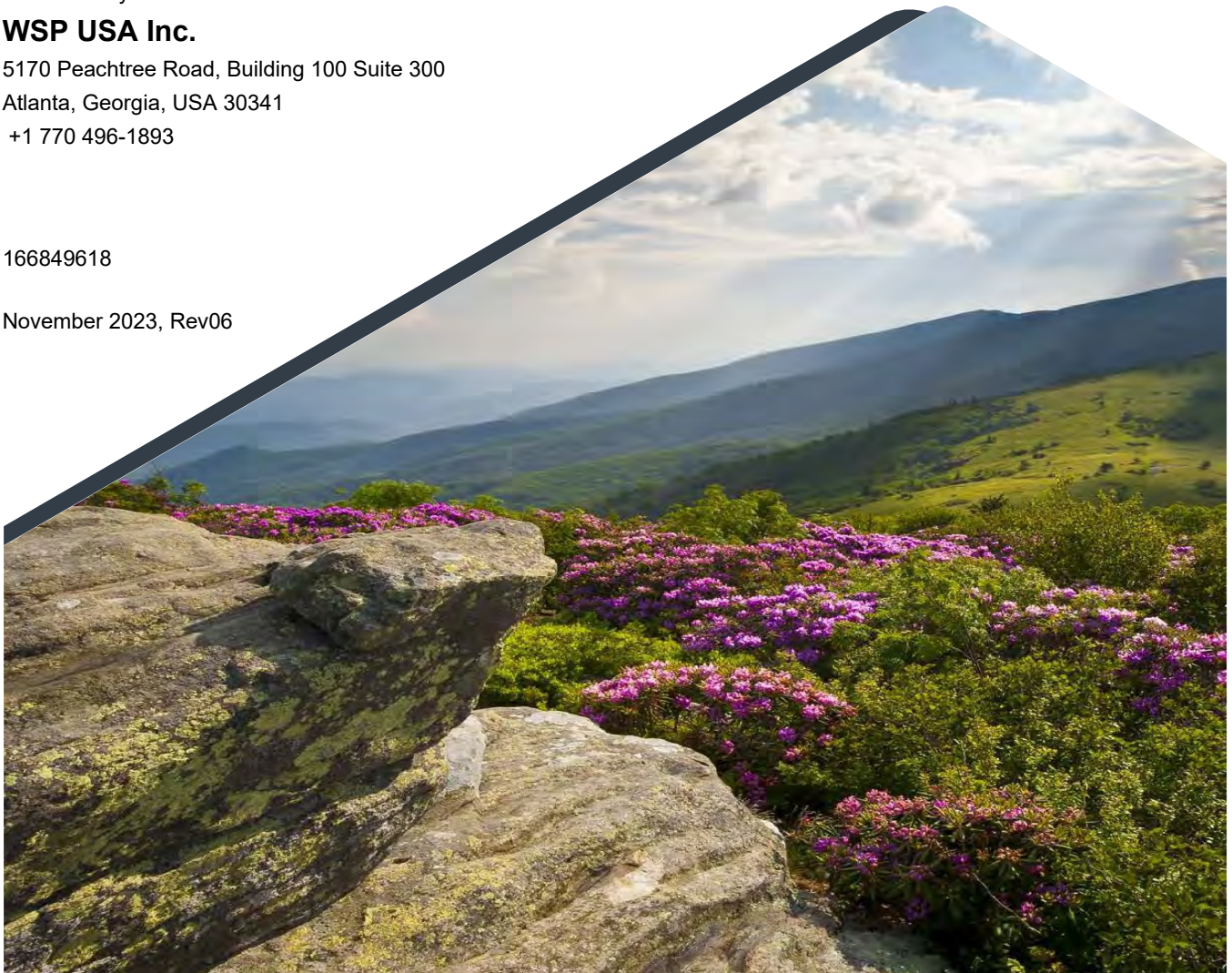
Submitted by:

**WSP USA Inc.**

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166849618

November 2023, Rev06





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## 1.0 INTRODUCTION

This document presents a summary of WSP USA Inc. (WSP) groundwater modeling for Georgia Power Company (GPC) Plant McDonough (Site) located in Cobb County, Georgia (Figure 1-1). The summary is developed from WSP model files and model descriptions available in WSP project files. WSP understands that Southern Company Services (SCS) is aiding in finalizing closure for four Coal Combustion Residual (CCR) ponds at the Site. The primary objectives of the groundwater modeling are to compare groundwater flow conditions at closure to baseline groundwater flow conditions and to evaluate the monitoring well network relative to the groundwater flow at the Site. To meet these objectives a groundwater flow model was developed to evaluate the following conditions at the Site:

- Baseline Groundwater Flow Conditions - August 2016 (Baseline Conditions) – Steady state flow conditions after the initial capping of Ash Pond 1 (AP-1). At the time of model development, groundwater data only includes data measured up to August 2016. As such, calibration and development of this model utilizes the August 2016 dataset.
- Groundwater Flow Conditions at Closure (Closure Conditions) – Capping of Combined Unit AP-3/4 (previously AP-3 and AP-4), barrier wall installed completely around AP-1, and installation of an underdrain at AP-3/4.

## 1.1 Site History

Plant McDonough is located in southeast Cobb County, Georgia (GA), and is owned and operated by the GPC. The Site operated as a coal-fired power plant until 2012 when the coal-fired units were replaced with three 840 megawatt combined cycle natural gas units. The property occupies approximately 390 acres and is bounded on the southeast by the Chattahoochee River. There are currently four ash ponds; Ash Pond 1 (AP-1), Ash Pond 2 (AP-2), and Combined Unit AP-3/4.

## 1.2 Current Conditions

The Site is currently in the process of closing its four ash ponds (AP-1, AP-2 and AP-3/4). The planned closure strategy for each pond is as follows:

- AP-1, inactive since 1968, has recently been closed in place with a Subtitle D Compliant engineered turf system for the closure cap.
- AP-2 was closed through removal of CCR. The majority of CCR removal from AP-2 was completed in 2016 and remnant CCR removal from AP-2 was completed in 2019.
- Ash Pond 3/4 are currently undergoing closure by a combination of closure by removal and closure in place with partial removal of ash. Ash will be removed from a line extending from 50 feet west of the existing stream diversion culvert beneath Ash Pond 4 and all points east of the culvert within AP-4, and from the areas in the northwest corner of AP-3 is being removed and consolidated in the remaining AP-3/4 footprint. The ponds were used for dry ash stacking operation from 1995 until the plant conversion to natural gas was completed in 2012.



## 2.0 GROUNDWATER MODEL CONSTRUCTION

### 2.1 Geologic and Hydrogeologic conditions

Refer to the Hydrogeologic Assessment Report for details regarding the conceptual site hydrogeologic model, local geologic conditions, and general background information.

### 2.2 Model Code

Model input files were created using a combination of Environmental System Research Institute ArcMAP-10.4.1 and the Environmental Simulations Inc. Groundwater Vistas 7 (GV) graphical user interface. A steady state groundwater flow model was developed using the MODFLOW-NWT finite difference model code (Niswonger, Panday, & Ibaraki, 2011), which is an enhanced version of the MODFLOW code (McDonald & Harbaugh, 1988). The MODFLOW-NWT code is designed to better solve problems involving unconfined aquifers, cell drying and rewetting and surface water/groundwater interactions.

### 2.3 Model Grid

The full model domain is 3.23 square miles (2,066 acres) and consists of a finite difference grid with 500 rows and 450 columns (900,000 total cells; 600,705 active cells) (Figure 2-1). The primary axis of the model grid is oriented north to south (0-degree rotation), parallel to the inferred groundwater flow direction. The grid cell length and width are a uniform 20 feet (ft) x 20 ft. Grid cell thickness is variable based on observed geologic unit thicknesses from historical monitoring/piezometer installation. The model layers are discussed in greater detail in Section 2.4.

### 2.4 Model Layers

Based on geologic and hydrogeologic conditions previously discussed, the model was divided into four hydrogeologic layers to represent ash, overburden, partially weathered rock (PWR), and bedrock as summarized below:

- **Model Top** – Represents surface topography of the ash and ground surface plus 1.0 ft outside ash boundaries; ranges in elevation from approximately 744 to 955 ft-mean sea level (msl). The elevations for the model top were determined using a combination of 2-ft contour survey data provided by GPC Land Department and Metro Engineering and Surveying from 10-16-2012 and Cobb County LiDAR data provided by Cobb County in April 2015. For Closure Conditions, the proposed final AP-3/4 closure grading was also used in conjunction with the previously listed sources.
- **Layer 1** – Ash; variable thickness based on as-built drawings. Layer 1 cells beyond ash pond boundaries are unused and constant thickness except at drain and river cells.
- **Layer 2** – Overburden; variable thickness based on historical subsurface investigation activities.
- **Layer 3** – PWR; variable thickness based on historical subsurface investigation activities.
- **Layer 4** - Bedrock; variable thickness based on historical subsurface investigation activities.
- **Model Bottom** – Bottom of model set at elevation 670 ft-msl.

South-North (model column 250) and West-East cross-sections through AP-3/4 (model row 210; Figure 2-2) depict the model stratigraphy and model layer geometry.



## 2.5 Boundary Conditions

The following sections describe the boundary conditions used in the model, including drains, unused cell boundaries, river boundaries, and wall boundaries (Figure 2-1).

### 2.5.1 Drain Boundaries

Drain boundaries were used to represent creeks, drainage ditches, and ash impoundment toe drains. Drain boundaries were defined using a combination of 2-ft contour survey data provided by GPC Land Department and Metro Engineering and Surveying from 10-16-2012 and Cobb County LiDAR data provided by Cobb County in April 2015.

### 2.5.2 Unused Model Cells

The model implicitly places unused cells (inactive) on the bottom, top, and sides of the model unless another boundary condition is specified. This is due to the fact that MODFLOW does not compute inter-cell flow through the outside edge of the grid. In areas within the grid, cells can also be specified as unused. Unused cells are used in the following manner within the Site model:

- **Northeast Corner** – Unused cells are placed at a groundwater divide. These unused cells are present in Layers 1 through 4.
- **Southern Corner** – Unused cells are placed south of a hydraulic feature and river boundary . These unused cells are present in Layers 1 through 4.
- **Layer 1** – In order to explicitly model the ash, separate from other lithologic units, cells are unused outside of ash pond limits. These used cells are present in Layer 1. The active model boundary can be viewed in Figure 2-1.

### 2.5.3 River Boundaries

A river boundary was placed in Layer 2 of the model representing a hydraulic feature south of the Site area (Golder, 2019). Water levels in the river boundary vary linearly and the slope is defined using USGS stage data from an upstream gage and a downstream gage. The river boundary stage within the model boundary ranges from 745.47 to 741.90 ft-msl. An additional river boundary was included to characterize an unnamed hydraulic feature to the west of the site. This river boundary was defined using Cobb County LiDAR data provided by Cobb County in April 2015.

### 2.5.4 Wall Boundaries

A wall boundary is defined as a horizontal flow barrier that is placed into the model along cell boundaries. The boundary condition is inserted into layer 2 of the Closure Conditions simulation to simulate a barrier wall from ground surface to the top of PWR that completely surrounds AP-1.

## 2.6 Recharge

Recharge rates were applied to the highest active layer of the model. Three zones are defined based on current land use:

- All areas outside of ponds,
- Capped ponds,



- Uncapped ponds or uncapped portions of ponds.

The parameter values in these zones vary for each scenario as follows:

### 2.6.1 Baseline Conditions Recharge

Recharge for all areas outside the ponds is 2.41 inches per year (in/yr) based on average annual rainfall data for the Atlanta area and the topography variations within the model domain. The site is not in a recharge zone that provides significant recharge to the local aquifer as defined by Georgia Department of Natural Resources' Digital Environmental Atlas of Georgia. AP-1 recharge is zero, representing a capped condition. AP-3/4 recharge is 10.73 in/yr (Figure 2-3).

### 2.6.2 Closure Conditions Recharge

Recharge for all areas outside the ponds is 2.41 in/yr. AP-1 is closed in the baseline conditions and the recharge is set to zero. AP-3/4 pond recharge is zero except at the stormwater pond within the AP-3/4 footprint where the recharge is 10.73 in/yr (Figure 2-4).

## 2.7 Aquifer Parameters

The following sections describe the aquifer parameters used in the modeling.

### 2.7.1 Hydraulic Conductivity

The hydraulic conductivity (K) terms used in the model include  $K_x$  (longitudinal K),  $K_y$  (transverse K), and  $K_z$  (vertical K). Longitudinal and transverse K were considered equivalent in all layers of the model and are hereafter combined into a single term ( $K_{xy}$ ). The hydraulic conductivity terms used for each scenario are described in the following sections.

#### Model Hydraulic Conductivity

Hydraulic conductivity zone values are the same in all models and are summarized in Table 2-1 below. Information regarding field measured values can be seen in sources as cited in addition to Table GW-2 in the Hydrogeologic Assessment Report.

**Table 2-1 – Model Hydraulic Conductivity**

Zone	Layer	Hydraulic Conductivity (ft/d) <sup>[1]</sup>	Source
Ash	1	0.55 (horizontal) 0.037 (vertical)	AP-3/4 CPT dissipation and aquifer testing data (Golder,2016)
Overburden	1 & 2	0.70 (horizontal) 0.14 (vertical)	Historical slug testing (Golder, 2016)
PWR	3	0.2 (horizontal) 0.02 (vertical)	Model calibration
Bedrock	4	0.16 (horizontal) 0.016 (vertical)	Model calibration

**Notes:**

ft/d = feet per day

[1] Assumed hydraulic conductivity vertical anisotropy ratios ( $K_{xy}/K_z$ ) varied between 5 and 15, which is typical for unconsolidated residuum and alluvial aquifers (Bendient et al., 1994).



The layer 1 areal zone extent varies between models. Conductivity zones include:

- Ash - Limited to within footprint of ash ponds.
- Overburden - Includes northern portion of AP-1 and fringes of AP-1 and AP-3/4 in Layer 1 and all of Layer 2.
- PWR – Includes all of model layer 3.
- Bedrock – Includes all of model layer 4.

The overburden zone value is assigned to all of layer 2. The PWR zone value is assigned to all of layer 3. The bedrock zone value is assigned to all of layer 4. The areal extent of zone values in layer 1 varies between models.

The ash conductivity value is assigned to the entire AP-3/4 area in the Baseline Conditions model. At AP-1 the northern portion of the pond is assigned the overburden value and the southern portion is assigned the ash value (Figure 2-5). Two hydraulic conductivity zones are assigned to AP-3/4 in the Baseline Conditions model and Closure Conditions model. The eastern portion is assigned the overburden value, the western portion is assigned the ash value. AP-1 conductivity zones in the Baseline Conditions model and Closure Conditions Model are unchanged from the Baseline Conditions model.

### 3.0 MODEL CALIBRATION

Model calibration consists of successive refinement of the model input data from initial assumptions/estimates to improve the fit between observed and model-predicted results. Model calibration should consider parameters such as hydraulic head, hydraulic conductivity, spatial boundary conditions (head/stage and fluxes), and the location and magnitude of applied stresses, such as recharge and drainage.

The purpose of the calibration effort for the Site was to simulate "steady-state" groundwater flow conditions that approximate the general flow patterns inferred from groundwater level measurements collected in August 2016. The model was calibrated through trial-and-error adjustment of model parameter values within reasonable ranges based on available site-specific data and literature references. Parameters that were included in model calibration include: hydraulic conductivity, recharge, drain boundary conductance, and river boundary conductance. The resultant calibrated model is described in the following sections.

### 3.1 Calibration Points

Groundwater level data for 35 monitoring points were entered as calibration points. Calibration target locations are shown on Figure 3-1. Measured water levels from August 2016 were used for calibration and are presented in Table 3-1 and on Figure 3-2. The calibration point elevations were assigned to the model row, column, and layer corresponding to the well location and screened interval for comparison to model groundwater level elevations.

**Table 3-1 - Calibration Targets**

Target Name	Easting (NAD 83 ft)	Northing (NAD 83 ft)	Model Layer	Observed Head Aug. 2016 (ft) <sup>[1]</sup>	Computed Head (ft NAVD 88)	Weight	Group	Residual (ft)
<b>USGS-10EE02</b>	2204179.513	1395565.891	2	824	823.02	1	1	0.98
<b>B25</b>	2201479.84	1392826.91	2	821.63	811.78	1	1	9.85



Target Name	Easting (NAD 83 ft)	Northing (NAD 83 ft)	Model Layer	Observed Head Aug. 2016 (ft) <sup>[1]</sup>	Computed Head (ft NAVD 88)	Weight	Group	Residual (ft)
B2	2202118.693	1393956.841	2	822.66	823.58	1	1	-0.92
B3	2202411.143	1394043.541	2	811.85	814.08	1	1	-2.23
B4	2202662.203	1394170.481	2	797.89	797.51	1	1	0.38
B5	2202962.793	1394309.251	2	785.98	789.55	1	1	-3.57
B6	2203255.163	1394424.071	2	787.4	787.50	1	1	-0.10
B7	2203595.173	1394373.411	2	799.54	802.44	1	1	-2.90
B8	2203881.823	1394325.091	2	812	808.59	1	1	3.41
B9	2204166.953	1394056.261	2	810.4	805.77	1	1	4.63
B10	2204197.803	1393818.471	2	802.79	798.70	1	1	4.09
B11	2204167.653	1393547.501	2	791.49	789.44	1	1	2.05
B12	2204125.013	1393151.161	2	765.72	767.96	1	1	-2.24
B13	2204084.663	1392881.611	2	760.19	770.78	1	1	-10.59
B14	2204013.213	1392575.341	2	770.41	772.35	1	1	-1.94
B15	2203675.773	1392544.701	2	786.06	789.44	1	1	-3.38
B16	2203313.213	1392596.211	2	802.6	802.75	1	1	-0.15
B17	2203049.043	1392645.881	2	809.35	809.35	1	1	0.00
B18	2202874.993	1392521.151	2	809.19	809.90	1	1	-0.71
B19	2202875.673	1392380.731	2	804.25	805.67	1	1	-1.42
B20	2202315.153	1392164.351	2	802.21	806.60	1	1	-4.39
B21	2202062.543	1392068.121	2	802.74	802.95	1	1	-0.21
B22	2201790.513	1392124.821	2	805.02	802.35	1	1	2.67
B23	2201582.863	1392242.101	2	804.61	802.52	1	1	2.09
B24	2201451.513	1392480.231	2	806.65	805.11	1	1	1.54
B27	2201744.773	1393423.511	2	830.16	827.61	1	1	2.55
B28	2201677.593	1391970.421	2	793.3	796.47	1	1	-3.17
B29	2201420.25	1391891.93	3	790.87	788.62	1	1	2.25
B31	2200926.823	1392035.971	3	764.17	773.46	1	1	-9.29
B37	2200919.393	1390483.941	2	753.01	751.89	1	1	1.12
B38	2201147.653	1390364.531	2	751.24	749.57	1	1	1.67
B39	2201538.453	1390303.391	2	751.82	752.07	1	1	-0.25
B40	2201826.763	1390625.631	2	760.98	759.75	1	1	1.23
B41	2201749.843	1390922.381	3	774.74	766.81	1	1	7.93
B42	2201866.973	1391328.161	2	778.08	778.91	1	1	-0.83

**Notes:**

ft = feet

NAD 83 = North American Datum of 1983 (Georgia West State Plane Coordinate System)

NAVD 88 = North American Vertical Datum of 1988

[1] Observed Head recorded for USGS-10EE02 was recorded on June 16, 1992.



## 3.2 Comparison of Observed and Predicted Heads

Observed hydraulic head elevations were compared to simulated hydraulic head elevations. The groundwater flow model was considered calibrated when the criteria listed in Table 3-2 were met.

**Table 3-2: Calibration Statistics**

Parameter	Description	Criteria objective	Parameter Value
Residual mean (RM)	Mean of the value of target residuals	0.0 ft	0.0 ft
Absolute residual mean (ARM)	Mean of the absolute value of the target residuals	7.89 ft (< 10% of the observed range in hydraulic head [78.92 ft])	2.76 ft
Root mean square error (RMSE)	Square root of the mean of the squared values of target residuals	7.89 ft (< 10% of the observed range in hydraulic head [78.92 ft])	3.87 ft
Mass balance discrepancy (Md)	Cumulative mass balance discrepancy of inflows and outflows	< 1%	-0.04%
Residual distribution	Spatial distribution of computed model residual values	Even spatial distribution	Even spatial distribution

(Overburden). Modeled Baseline Conditions and observed potentiometric heads for August 2016 are summarized in Table 3-1. Model residual values plotted on Figure 3-3, show that the predicted potentiometric heads closely match the observed head conditions. Simulated groundwater elevations are consistent with the interpreted water table contour map presented in the Hydrogeologic Assessment Report.

## 3.3 Sensitivity Analysis

The parameter estimation (PEST) code (Watermark Numerical Computing, 2016) was used to assess the model's sensitivity to changes in aquifer parameters. The PEST code contains an algorithm that uses the sensitivity of targets to guide the selection of model parameter values. The goal of PEST is minimization of a mathematical objective function, typically the residual sum of squares (RSS; phi in PEST terms), to achieve a close fit between observed and model-calculated groundwater levels while maintaining reasonable values for model parameters and stresses. A lower value of phi represents a better match between the model and target observations.

PEST was used to evaluate the following model parameters in the Baseline Conditions presented in Table 3-2:

- $K_{xy}$ : Overburden, PWR, Ash, Bedrock
- Recharge Zones 1 and 3 (areas outside the pond limits)
- Recharge Zone 6 (AP-3/4)

PEST results are evaluated using the overall reduction in phi as well as the overall sensitivity of each parameter (reported as a percentage by PEST). Parameters with a sensitivity greater than 1% are generally considered sensitive.



Sensitivity analysis results (Table 3-3) indicate that the model is sensitive to the  $K_{xy}$  of the Layer 2 (overburden) and recharge in Zones 3 (vegetated pervious areas) and 6 (AP-3/4). The model is less sensitive to  $K_{xy}$  of Zones 3, 4 and 5 and recharge in Zone 1.

**Table 3-3: PEST Sensitivity Results**

Parameter	Model Value (feet/day)	Sensitivity (%)	Comment
<b>Kx Zone 2 (Overburden)</b>	8.68E-01	3.69	Sensitive
<b>Kx Zone 3 (Saprolite)</b>	2.81E-03	0.02	Not sensitive
<b>Kx Zone 4 (Ash)</b>	7.00E-01	0.17	Not sensitive
<b>Kx Zone 5 (Bedrock)</b>	1.00E-04	0.01	Not sensitive
<b>Recharge Zone 1 (Vegetated Pervious Areas)</b>	2.70E-06	0.01	Not sensitive
<b>Recharge Zone 3 (Vegetated Pervious Areas)</b>	6.26E-04	1.82	Sensitive
<b>Recharge Zone 6 (AP-3/4)</b>	1.00E-03	2.27	Sensitive

## 4.0 FLOW MODEL RESULTS

The following sections summarize the results of the groundwater flow modeling.

### 4.1 Baseline Conditions Model

The Baseline Conditions simulates August 2016 site conditions. The model is steady state which conceptually represents long-term average hydraulic conditions with no changes in hydraulic stress within the model domain. North of the facility model predicted flow is from the northwest corner of the model domain to the south and southeast toward simulated river boundary condition cells. Predicted flow in the southern portion of the model is from the southeast corner of the model north and northwest toward simulated river boundary condition cells. Model predicted water table elevation contours are shown on Figure 4-1. Figure 4-1 shows simulated groundwater elevations are affected by surface water and drainage features and AP-3/4. Simulated groundwater flow is captured by river boundary condition cells to the west and south of the facility. Simulated groundwater is also captured by drain boundary condition cells that represent smaller scale features in the model.

A large groundwater sink is present north of AP-3/4. The sink is associated with the unnamed creek immediately north of the pond and with an ash impoundment toe drain adjoining the pond. The sink extends into the bedrock and to the bottom of the model domain. The sink captures groundwater in a portion of the model domain north of AP-3/4, including groundwater in a portion of AP-3/4.

The model predicts groundwater mounding in the northwest corner of AP-3/4. The predicted mound is caused by a combination of higher recharge in the pond compared to other portions of the model and a higher pond bottom elevation. The effect of the mound extends to the bottom of the model.



Layer 3 and 4 model predicted water level elevations have a similar pattern to layer 2. The layer 2 groundwater sink and mound extend through layer 3 to the bottom of layer 4. Model predicted layer 3 and 4 water level elevation contours are shown on Figure 4-1. A model-wide mass balance was completed and resulted in a model-wide mass balance error for both the Baseline Conditions and the Closure Conditions models of less than 1%.

## 4.2 Closure Conditions Model

The Closure Conditions model simulates a steady state representation of the capping of AP-3/4 and AP-1 and a barrier wall installed around AP-1. The barrier wall is simulated as extending from ground surface to the bottom of layer 2, the bottom of the saprolite-soil unit. The wall is assigned a thickness of 3 ft and a hydraulic conductivity of  $2.6 \times 10^{-4}$  ft/d. Assigned recharge for AP-3/4 is zero, except for a small area in the northeast portion of the pond which represents a stormwater detention basin.

The results of the simulation of Layer 1 and Layer 2 are shown on Figure 4-2. The results of the simulation of Layer 3 and Layer 4 are shown on Figure 4-3. The direction of groundwater flow is expected to transition from semi-radial to southerly. Two small groundwater sinks are present to occur in Layer 2, within the same area as the single large sink within the Baseline Conditions model. One of the sinks extends to Layer 3 covering a very small area. The sink does not extend to Layer 4.

The pond capping of AP-3/4 and AP-1 are predicted to reduce water table elevations over a large portion of the site as shown on Figure 4-4. Figure 4-4 shows simulated water table elevation reductions in layer 2, which corresponds to the layer where the water table is present outside the ponds. The reductions are relative to the steady-state, Baseline Conditions model predictions. Simulated water level reductions greater than 40 ft occur beneath and in the vicinity of AP-3/4. Simulated water level elevation reductions in layers 3 and 4 are similar in magnitude and extent to layer 2. The maximum layer 4 simulated water level elevation reduction is 39 ft. Layer 3 and 4 water level simulated elevation reductions are shown on Figure 4-4.

The wall is predicted to reduce flow across the western side of AP-1 in the overburden (Layer 2) by 74 percent compared to the Baseline Conditions model. The wall is predicted to reduce flow across the southern side of AP-1 in the overburden (Layer 2) by 70 percent compared to the Baseline Conditions model. The model predicts that the construction of a barrier wall will increase flow in the PWR (Layer 3). GPC plans to update and refine the model by incorporating data collected at the site since August 2016. The model report will be updated as appropriate.

## 5.0 SUMMARY OF GROUNDWATER MODEL FINDINGS

Model simulated groundwater flow patterns are consistent with the conceptual model of groundwater flow in the Site area. The models simulate groundwater flow from north to south across the Site. Key findings from model results are summarized as follows:

- Model calibration results show that the predicted potentiometric heads closely match the observed heads.
- Installation of a cap over AP-3/4 will reduce recharge in the AP-3/4 area. Simulated water level elevations are predicted to decline across the plant site by up to 40 ft with the maximum decline occurring under AP-3/4. The simulated water level declines are great enough to desaturate large portions of the overburden and saprolite beneath the plant.



- AP-3/4 capping and installation of a wall around AP-1 are predicted to decrease groundwater flow through AP-1 CCR material. Simulated flow through AP-1 CCR material is reduced by 74 percent when AP-3/4 is capped and a wall is installed around AP-1. Water levels are predicted to drop up to 10 ft, in the AP-1 area and up to 40 ft in the AP-3/4 area.

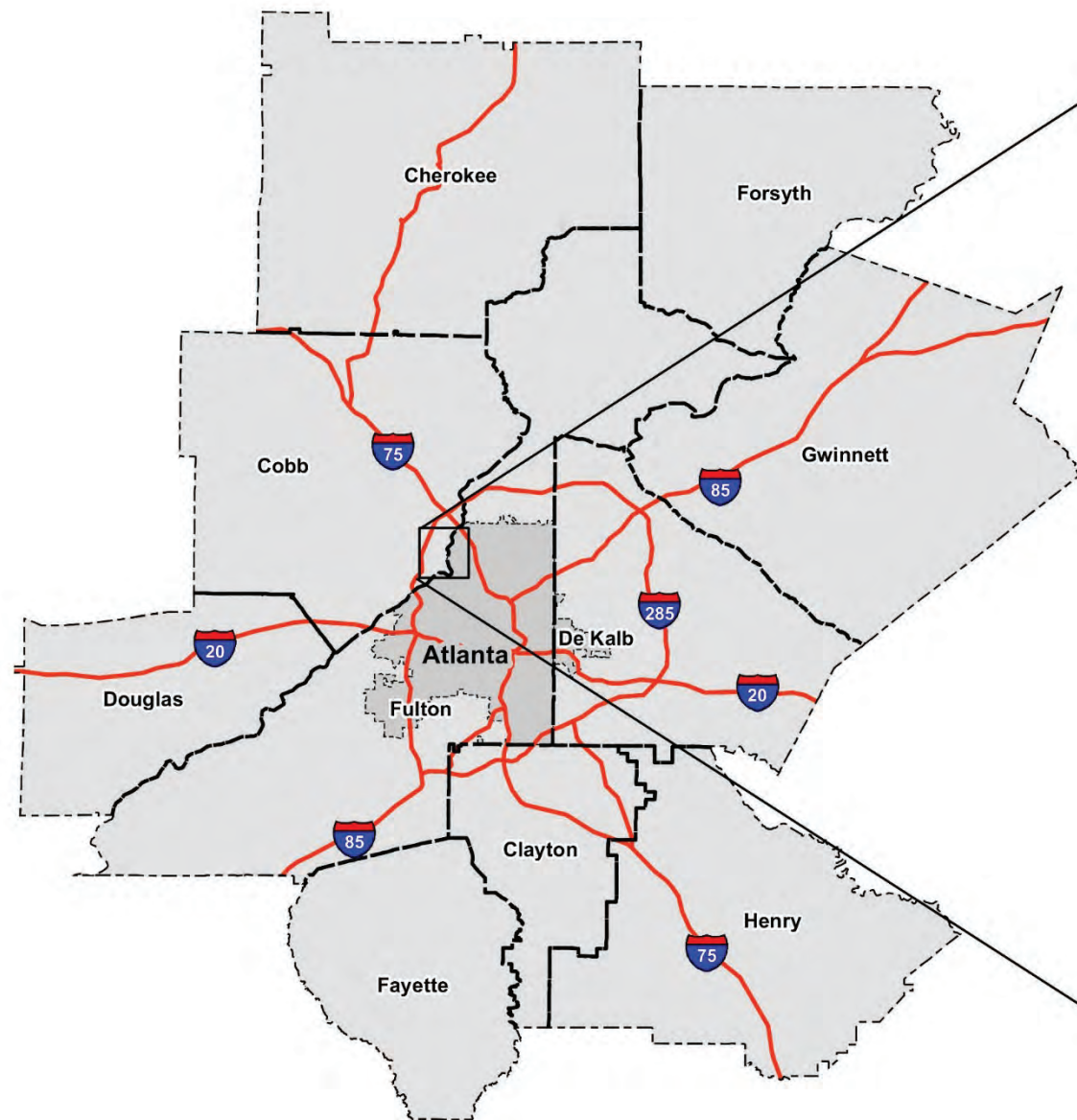
## 6.0 REFERENCES

- Bedient, P.B., Rifai, H.S., and Newell, C.J. (1992) *Ground Water Contamination*. Prentice-Hall, Engelwood Cliffs, New Jersey.
- Fetter, C. (2001). *Applied Hydrogeology*, Fourth Edition. Upper Saddle River, New Jersey: Prentice Hall.
- Freeze, R.A. and Cherry, J.A. (1979). *Groundwater*. Englewood Cliffs, NJ: Prentice Hall, 604 p.
- Golder Associates, Inc. (2016). *Data Report on Investigations for Closure of AP-3/4 Plant McDonough-Atkinson, Atlanta, GA*.
- Golder Associates, Inc. (2019). Plant McDonough-Atkinson (CCR Unit AP-1, CCR Unit AP-2, and Combined CCR Unit AP-3/4, Hydrogeologic Assessment Report, October 2020.
- McDonald, M. G., & Harbaugh, A. W. (1988). Chapter A1, A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model. In *Techniques of Water-Resources Investigations of the United States Geological Survey* (p. 586). Washington: United States Geological Survey Printing Office.
- Niswonger, R. G., Panday, S., & Ibaraki, M. (2011). MODFLOW-NWT, A Newton Formulation for MODFLOW 2005: U.S. Geological Survey Techniques and Methods 6-A37. Reston, Virginia: United States Geological Survey.
- Peck, M., & Painter, J. (2016). Groundwater conditions in Georgia, 2012–14: U.S. Geological Survey Scientific Investigations Report 2016–5161. 55 p.
- Watermark Numerical Computing. (2016). *PEST, Model-Independent Parameter Estimation, User Manual Part I: PEST, SENSAN and Global Optimisers, 6th Edition*.

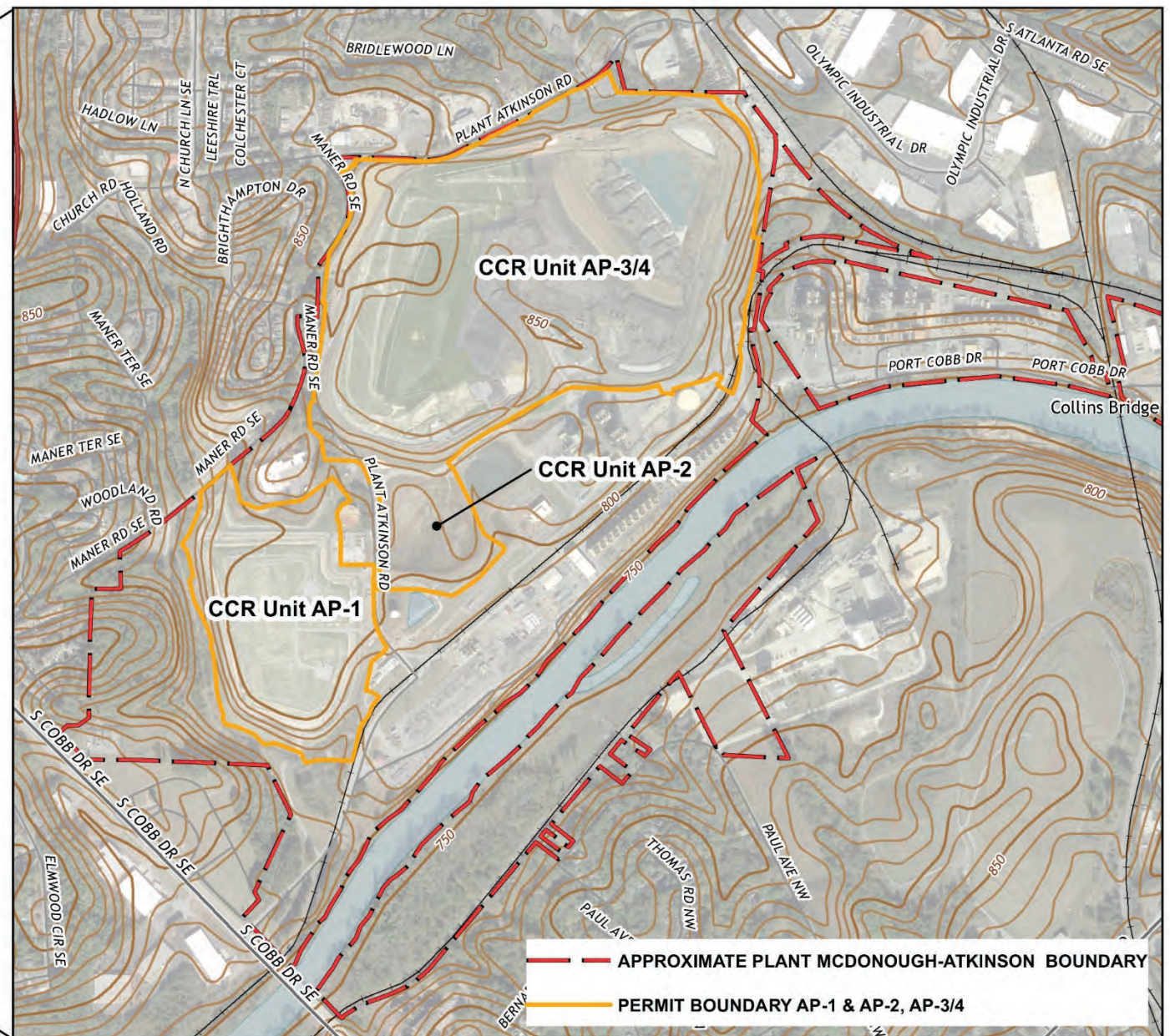


## Figures



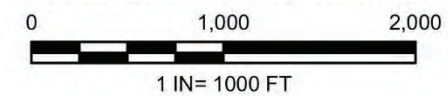


**SITE VICINITY MAP**



REF: USGS 7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE:  
MABLETON, GA 1992 & NORTHWEST ATLANTA, GA 1993

**SITE LOCATION MAP**



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SOUTHERN COMPANY SERVICES



PROJECT  
PLANT MCDONOUGH

CONSULTANT

YYYY-MM-DD 2019-10-11  
DESIGNED JRJ  
PREPARED JRJ  
CHECKED WEG  
REVIEWED/APPROVED GLH

TITLE

**SITE LOCATION MAP**

PROJECT NO.  
1668496

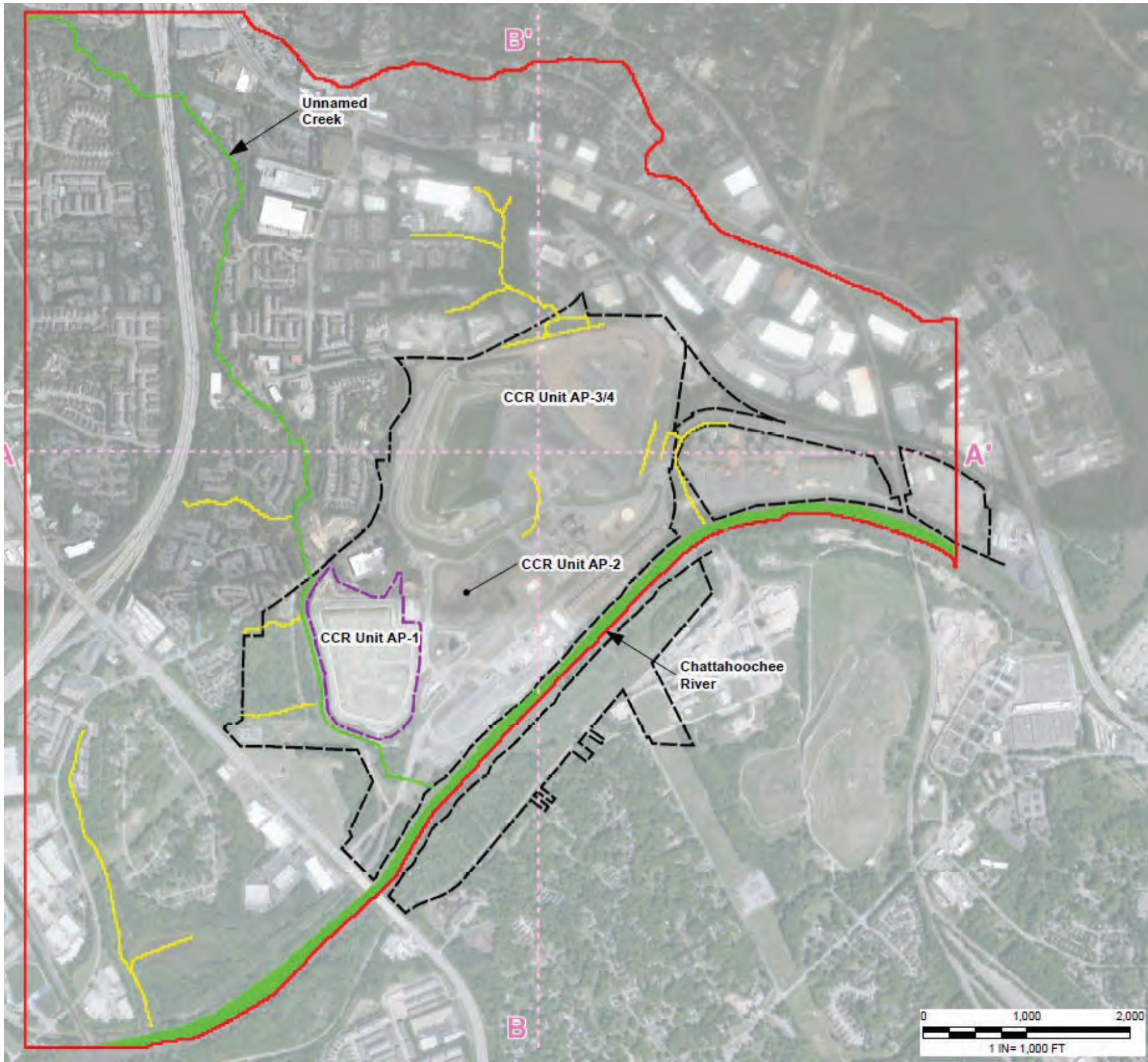
CONTROL

REV.  
A

FIGURE  
1-1







**Legend**

- Drain Boundary
- River Boundary
- Constant Head Boundary
- Active Model Boundary
- - Plant Boundary (Approximate)
- .... Model Cross Section Transect
- .... AP-1 Barrier Wall

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PROJECT  
PLANT MCDONOUGH

TITLE  
**MODEL DOMAIN AND BOUNDARY CONDITIONS**

PROJECT NO.  
1668496

CONTROL

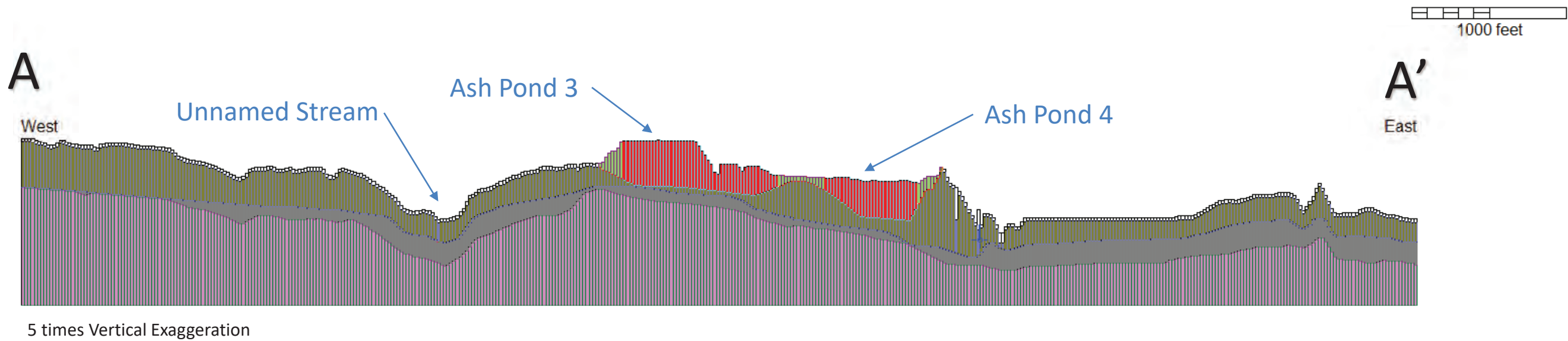
REV.  
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FIGURE  
2-1

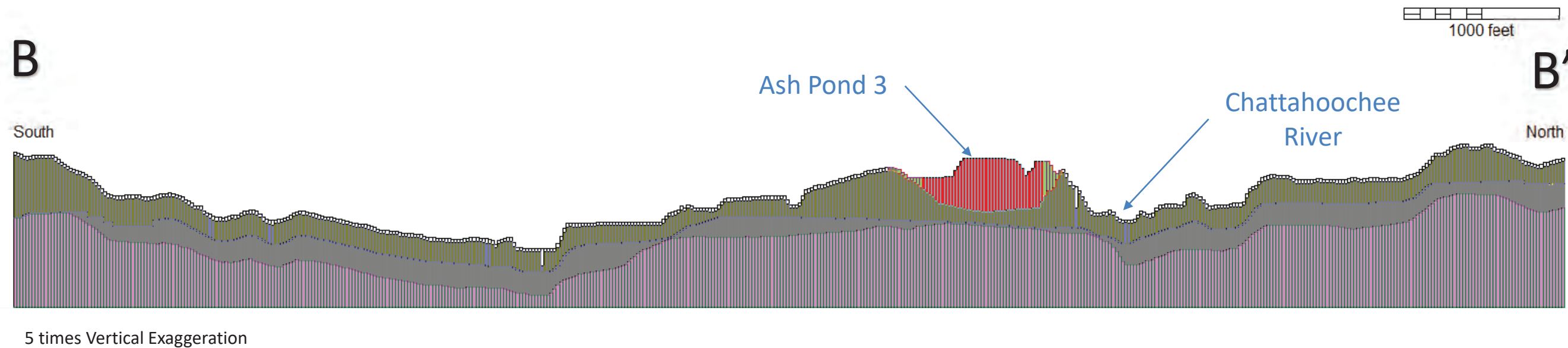
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Model Cross Section – West to East (Row 210)



Model Cross Section – South to North (Column 250)



Legend

Hydraulic Conductivity (feet/day)

- |                     |                              |
|---------------------|------------------------------|
| Ash – 0.55 ft/d     | Overburden – 0.73 ft/d       |
| Bedrock - 0.16 ft/d | Weathered Bedrock – 0.2 ft/d |

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PROJECT  
PLANT MCDONOUGH

TITLE  
MODEL CROSS SECTIONS – EAST-WEST & NORTH-SOUTH

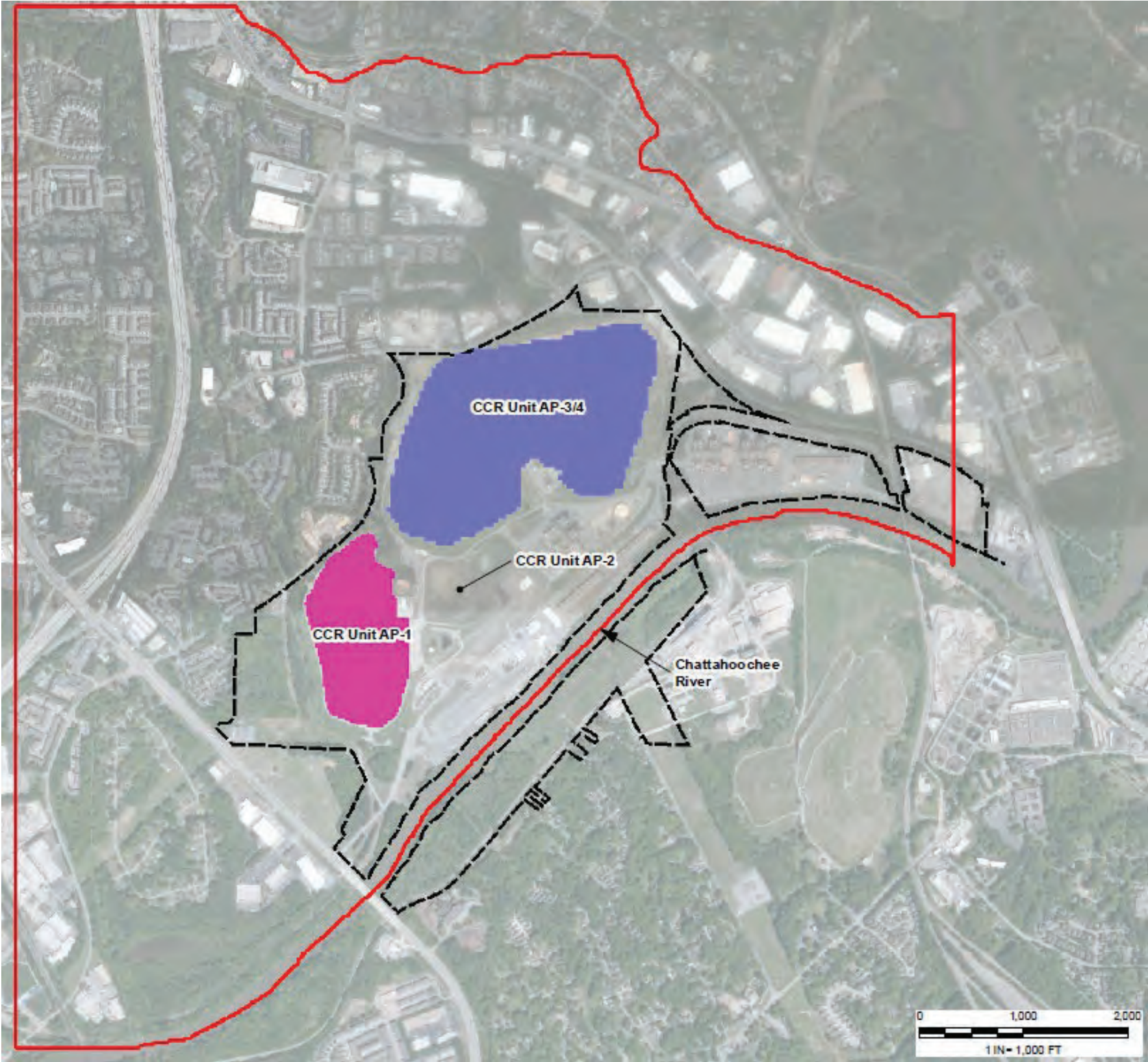
PROJECT NO.  
1668496

CONTROL






REV.  
A

FIGURE  
2-2





**Legend**

-  Ash Pond 1: No Recharge
-  Ash Ponds 3 & 4:  
Recharge = 10.73 in/yr
-  Rest of Model Domain:  
Recharge = 2.41 in/yr
-  Active Model Boundary
-  Plant Boundary (Approximate)

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DESIGNED JRJ  
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CHECKED WEG  
REVIEWED/APPROVED GLH

PROJECT  
PLANT MCDONOUGH

TITLE  
**PRE-CLOSURE MODEL RECHARGE ZONES (LAYER 1)**

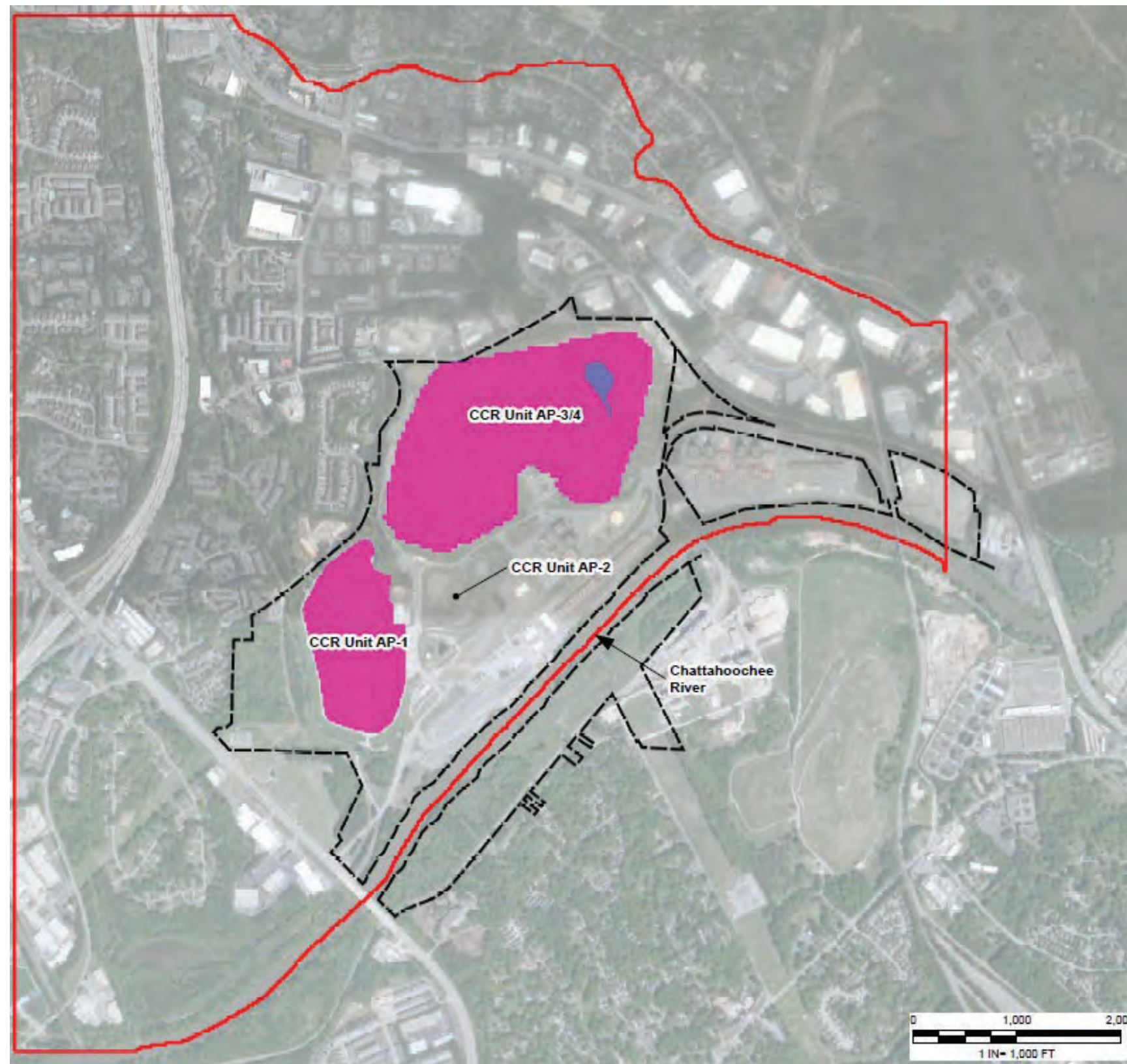
PROJECT NO.  
1668496

CONTROL

REV.  
A

FIGURE  
2-3





## Legend

- No Recharge
- Recharge = 10.73 in/yr
- Rest of Model Domain:  
Recharge = 2.41 in/yr
- Active Model Boundary
- Plant Boundary  
(Approximate)

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PROJECT  
PLANT MCDONOUGH

TITLE

AP-1 BARRIER WALL CLOSURE MODEL RECHARGE ZONES (LAYER 1)

PROJECT NO.  
1668496


CONTROL


REV.  
A

FIGURE  
2-4





Legend

 **Ash (Model Zone 1)**  
 $K_{xy} = 0.73 \text{ ft/d}$   
 $K_z = 0.14 \text{ ft/d}$


 **Ash (Model Zone 4)**  
 $K_{xy} = 0.55 \text{ ft/d}$   
 $K_z = 0.037 \text{ ft/d}$

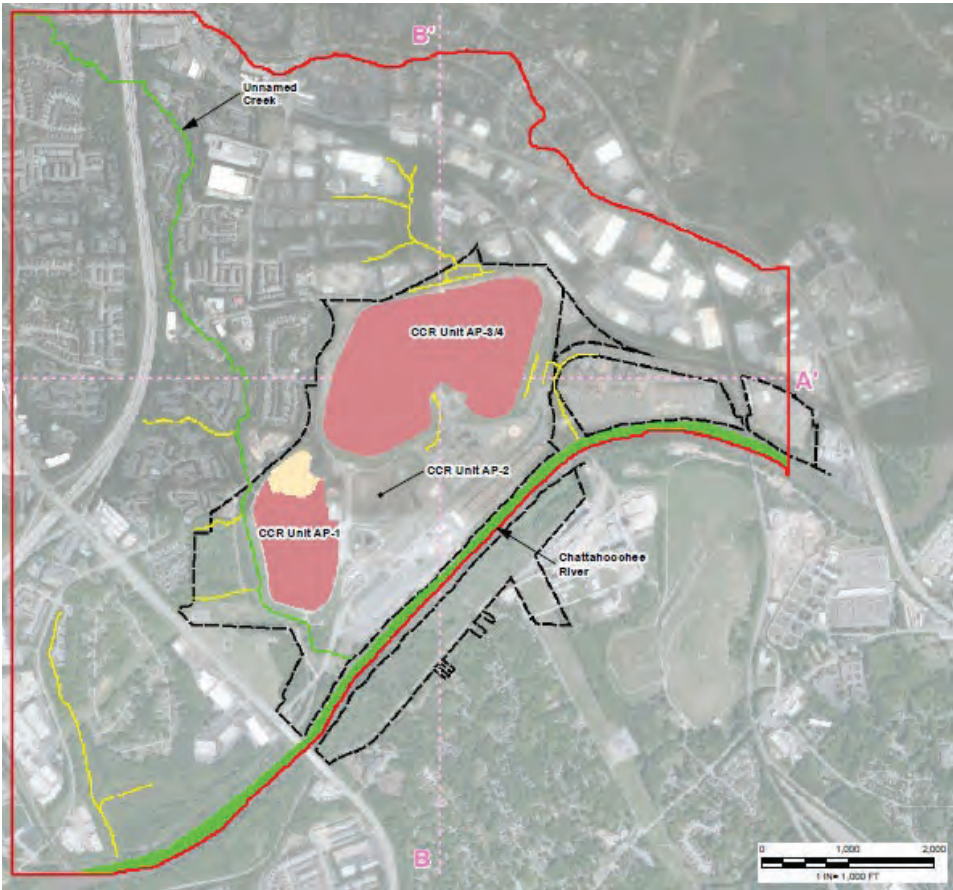
 **Overburden (Model Layer 2 - not depicted)**  
 $K_{xy} = 0.73 \text{ ft/d}$   
 $K_z = 0.14 \text{ ft/d}$

 **Saprolite (Model Layer 3 - not depicted)**  
 $K_{xy} = 0.2 \text{ ft/d}$   
 $K_z = 0.02 \text{ ft/d}$

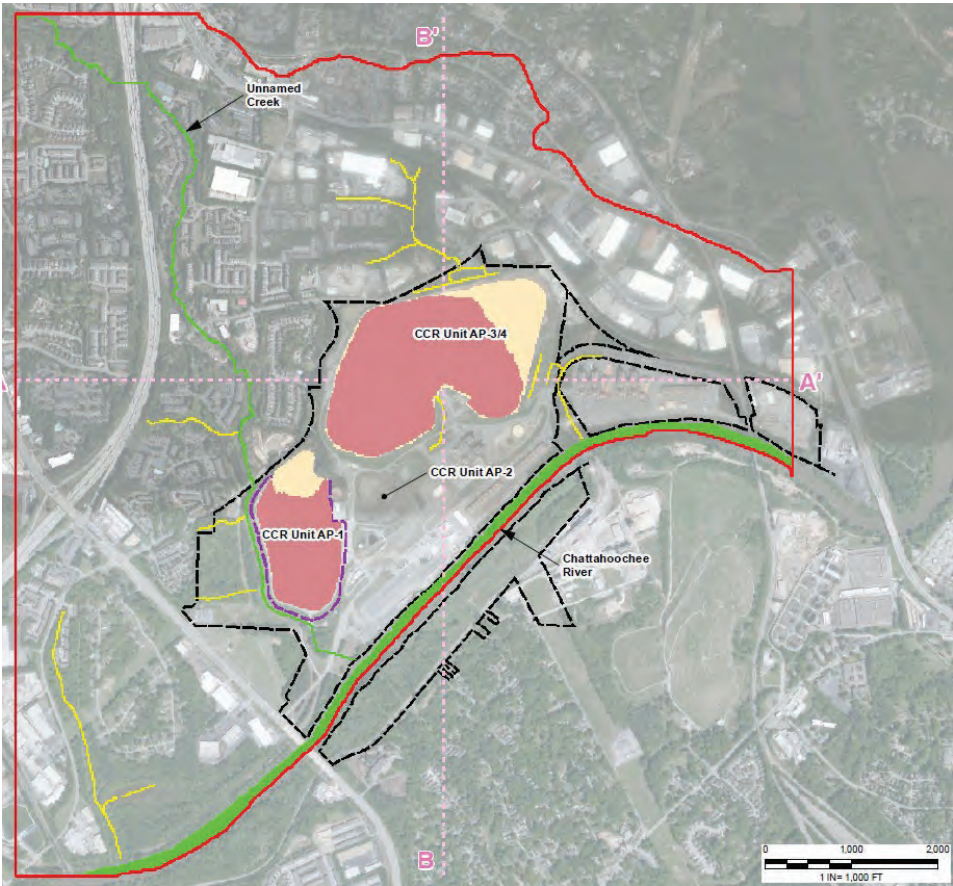
 **Bedrock (Model Layer 4 - not depicted)**  
 $K_{xy} = 0.16 \text{ ft/d}$   
 $K_z = 0.016 \text{ ft/d}$

 Active Model Boundary

 Plant Boundary (Approximate)



Base Model - Layer 1 Hydraulic Conductivity



AP-1 Barrier Wall Closure Model - Layer 1 Hydraulic Conductivity

**Notes:**  
 $K_{xy}$  = Horizontal and transverse hydraulic conductivity  
 $K_z$  = Vertical hydraulic conductivity

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PROJECT  
PLANT MCDONOUGH

TITLE  
**MODEL LAYER 1 HYDRAULIC CONDUCTIVITY**

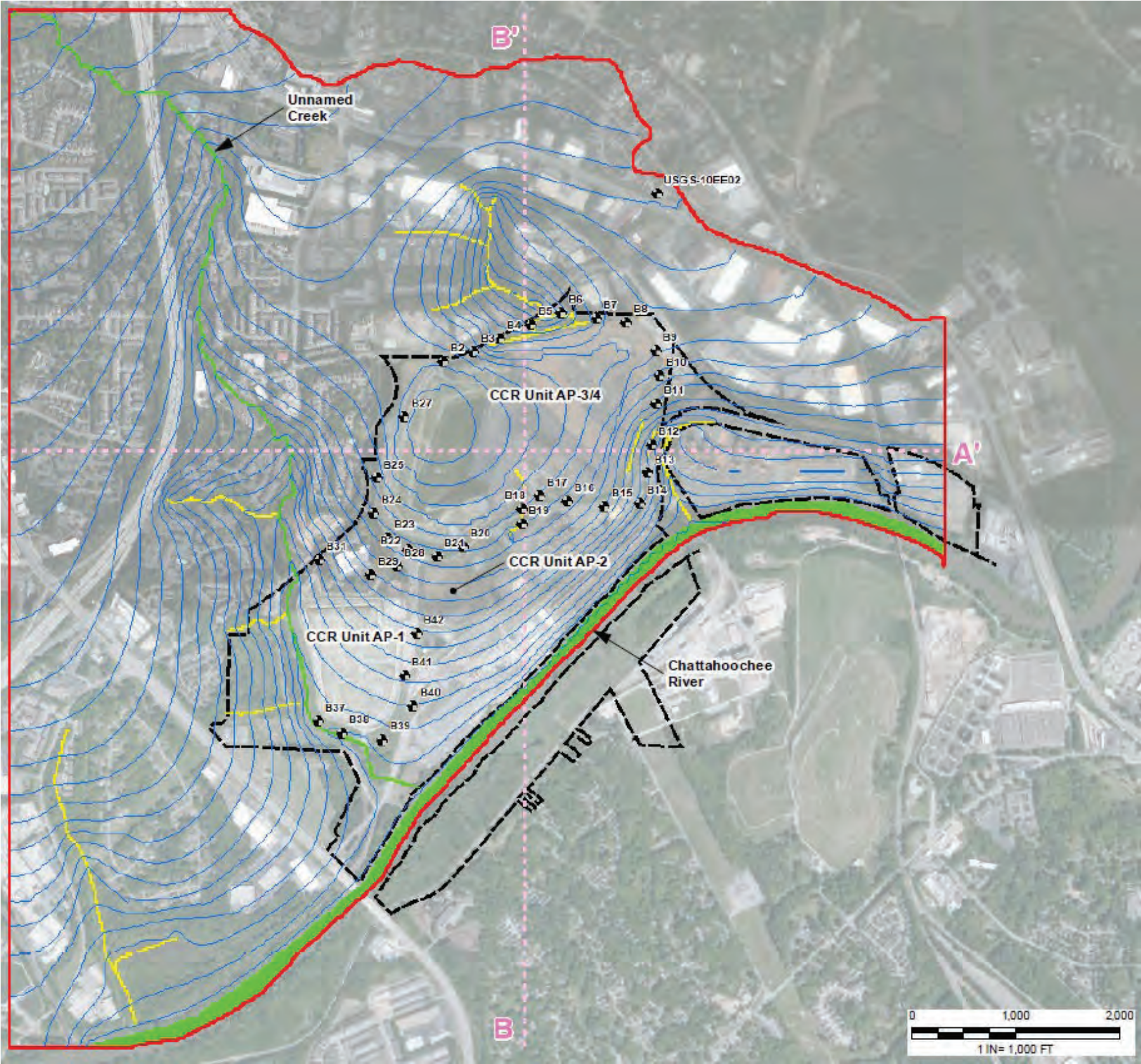
PROJECT NO.  
1668496

CONTROL

REV.  
A

FIGURE  
2-5





**Legend**

- Monitoring Well
- Drain Boundary
- River Boundary
- Constant Head Boundary
- Active Model Boundary
- Plant Boundary (Approximate)
- Simulated Groundwater Elevation (ft)

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PROJECT  
PLANT MCDONOUGH

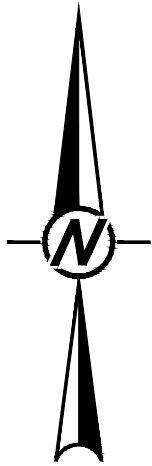
TITLE  
**CALIBRATION TARGET LOCATIONS AND PRE-CLOSURE BASE MODEL  
LAYER 2 SIMULATED GROUNDWATER ELEVATIONS**

PROJECT NO. 1668496 CONTROL REV. A FIGURE 3-1

1. If this measurement does not match what is shown, the sheet size has been modified from A3 to B.



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## LEGEND

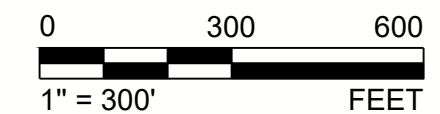
- EXISTING CONTOURS
- PROPERTY BOUNDARY MARKERS/LIMITS
- APPROXIMATE CELL LIMITS
- GROUNDWATER SURFACE CONTOURS
- P & W 1977 PIEZOMETERS (SEE REFERENCE)
- AT&E 1981 BORINGS (SEE REFERENCE)
- E&CE 2012 GROUNDWATER MONITORING WELLS (SEE REFERENCE)
- E&CS 2013 GROUNDWATER MONITORING WELLS (SEE REFERENCE)
- GOLDER 2015 BORING LOCATIONS
- GOLDER 2015 CPT LOCATIONS
- PZ-1 GOLDER 2015 PIEZOMETER LOCATION
- GOLDER 2015 ASH DEWATERING WELLS
- B-51 GOLDER MONITORING WELLS
- GOLDER PIPE CORRIDOR DEWATERING WELL
- MTP-3 MORETRENCH PIEZOMETER
- MORETRENCH DEWATERING WELL

## NOTES

- GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
- GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATA, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS, THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL CONDITIONS.

## REFERENCES

- THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA LAND DEPARTMENT AND METRO ENGINEERING AND SURVEYING CO., INC. THE DATE OF THE SURVEY PROVIDED AND SHOWN ON THIS SET OF PLANS IS 10-16-2012. REFER TO THE SURVEY DRAWING TITLED "TOPOGRAPHIC MAP PREPARED FOR GEORGIA POWER COMPANY PLANT MCDONOUGH - GEORGIA STATE PLANE WEST SURVEY FEET - DATE OF PHOTOGRAPHY 10-26-12. PROJECT NO. 13225 - 01-13-2013."
- THE REVISED TOPOGRAPHY & CONTOUR ELEVATIONS WERE PROVIDED BY GEORGIA POWER LAND DEPARTMENT. THE DATA SHOWN IS AN UPDATE TO THE PLANS DONE ON 10-16-2012 & THE ONSITE CHANGES SINCE THAT 2012 SURVEY. THE REVISED SURVEY WAS DONE ON 1-12-2016 & MERGED WITH THE DATA ON 10-16-2012.
- GEORGIA POWER COMPANY PLANT MCDONOUGH ASH PONDS - GEORGIA STATE PLANE WEST SURVEY FEET - DATE OF SURVEY 1-12-2016 - LAND ENG. PROJECT # 20160020.
- LAW ENGINEERING GEOTECHNICAL INVESTIGATION REPORT (1968).
- PATTERSON AND DEWAR ENGINEERS PIEZOMETER INSTALLATION REPORT (1977).
- ATLANTA TESTING AND ENGINEERING GEOTECHNICAL REPORT (1981).
- GOLDER ASSOCIATES SITE INVESTIGATION (2006).
- E AND CS PLANT MCDONOUGH HYDROGEOLOGICAL INVESTIGATION (2012).
- E AND CS ASH POND 3 AND 4 CLOSURE BORINGS (2013).
- GOLDER 2015 INVESTIGATION LOCATIONS SURVEYED BY LOWERY AND ASSOCIATES ON 11/12/15.



△	2020-11-02	UPDATE TITLE BLOCK	GLH	AVR	LS	GLH
△	2016-09-27	ISSUED	SEP	KNJ	GLH	GLH
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW

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PROJECT

PLANT MCDONOUGH

TITLE

2016 OBSERVED GROUNDWATER ELEVATIONS AND CONTOURS

CONSULTANT



YYYY-MM-DD 2016/09/27

DESIGNED KNJ

PREPARED SEP

CHECKED GLH

REVIEWED/APPROVED GLH

PROJECT NO.  
1668496

PROJECT ID  
MCD15017

REV.  
1

FIGURE  
3-2

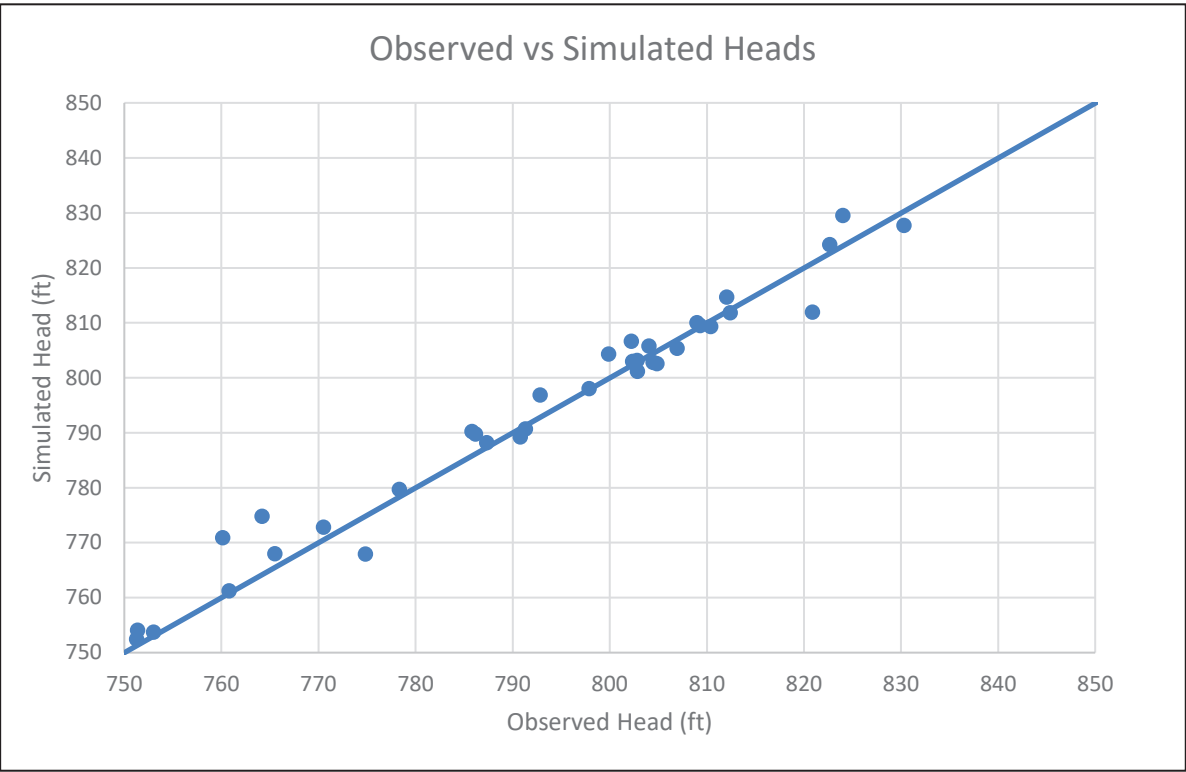
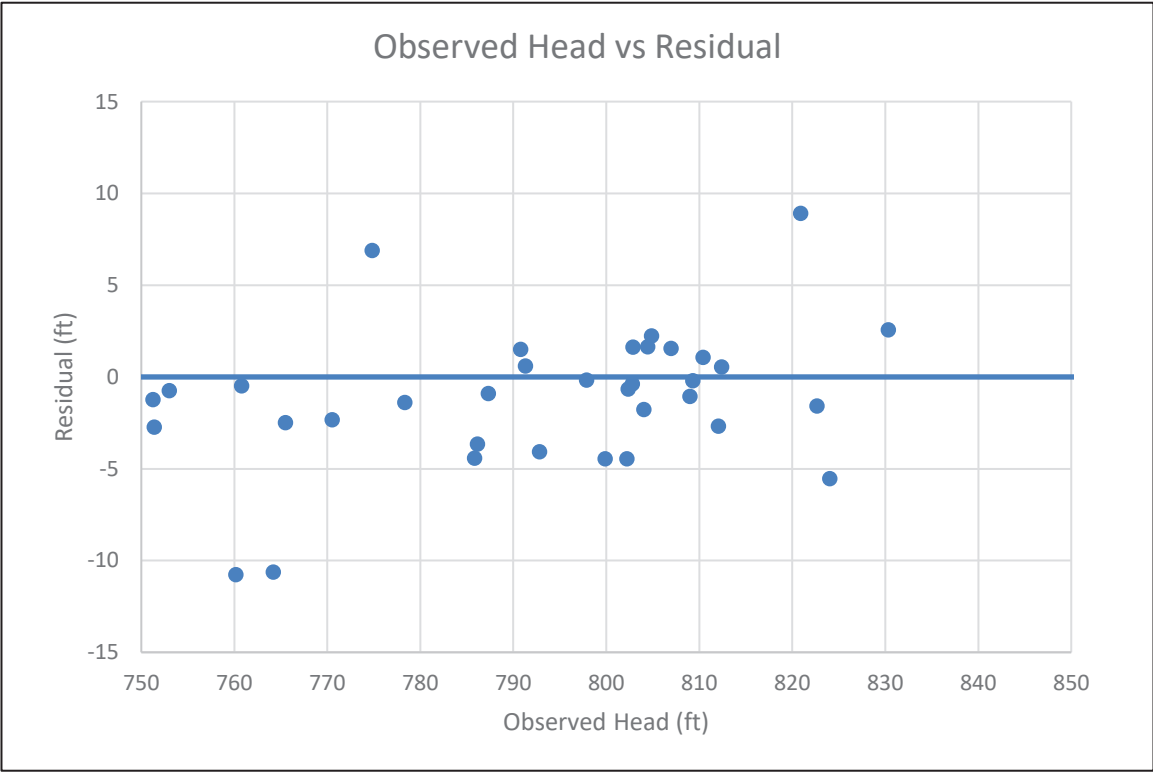
Golder Piezometer Identification	Groundwater Elevation (feet AMSL) 10/06/2016
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PZ-2	808.78
PZ-3	806.98
PZ-4	806.29
PZ-5	-
PZ-6	811.92
PZ-7	811.80
Notes: 1. AMSL = above mean sea level 2. -- = no data available	


P&W Piezometer Identification	Groundwater Elevation (feet AMSL) 09/28/2016
AP-3	773.91
P-1	DRY
P-1A	797.95
P-2	793.86
P-4	788.26
P-4A	787.51
P-5	782.10
P-7	DRY
P-7A	813.07
P-9	815.68
P-10A	799.07
P-10B	799.77
P-11	791.61
P-12	787.98
P-13	784.77
AP-2	782.42
Notes: 1. AMSL = above mean sea level 2. -- = no data available	

Moretrench Piezometer Identification	Groundwater Elevation (feet AMSL) 10/06/2016
MTP-8	812.56
MTP-7	819.82
MTP-4	821.58
MTP-3	807.48
MTP-2	819.26
MTP-6	826.56
MTP-5	828.38
MTP-1	823.49
MTP-0	825.75
Notes: 1. AMSL = above mean sea level 2. -- = no data available	

E&CE Piezometer Identification	Groundwater Elevation (feet AMSL) 10/06/2016
B-2	822.29
B-3	811.10
B-4	797.53
DGWC-5	785.92
B-6	787.32
B-7	798.52
DGWA-8	810.49
DGWA-9	809.47
DGWC-10	802.15
DGWC-11	791.42
DGWC-12	765.63
DGWC-13	760.01
DGWC-14	770.13
DGWC-15	785.78
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B-23	803.97
B-24	805.95
B-25	822.05
DGWA-26	828.35
DGWA-27	829.38
B-28	792.37
B-29	790.48
B-31	763.68
DGWC-37	752.85
DGWC-38	751.16
DGWC-39	751.94
DGWC-40	761.44
B-41	774.12
DGWC-42	777.08
AP1-14	-
AP4-01	-
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B-48	771.34
B-50	782.17
B-51	753.57
B-52	797.50
B-53	840.66
B-54	781.03
B-55	813.06
B-56	807.31
B-57	767.73
B-58	765.90
B-59	782.60
B-60	748.68
B-61	759.87
B-62	741.77
Notes: 1. AMSL = above mean sea level 2. -- = no data available	





CLIENT GEORGIA POWER COMPANY/ SOUTHERN COMPANY SERVICES			PROJECT PLANT MCDONOUGH		
CONSULTANT 			TITLE MODEL CALIBRATION SUMMARY		
DESIGNED PREPARED CHECKED REVIEWED/APPROVED GLH			PROJECT NO. 1668496 CONTROL REV. A FIGURE 3-3		
YYYY-MM-DD 2019-10-11 JRJ JRJ WEG					







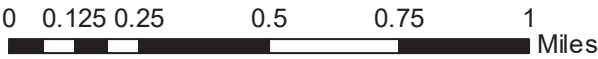


NOTES:

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY

LEGEND

-  River Boundary Conditions
-  Drain Boundary
-  Groundwater Elevation Contour (ft)
-  Model Area



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YYYY-MM-DD 2020-02-26

DESIGNED CB

PREPARED JRJ

CHECKED CB

REVIEWED/APPROVED CB

PROJECT  
PLANT MCDONOUGH

TITLE  
**Baseline Conditions Modeled Groundwater Elevation  
Contours**

PROJECT NO.  
1661841

PHASE  
3

REV.  
0

FIGURE  
**4-1**

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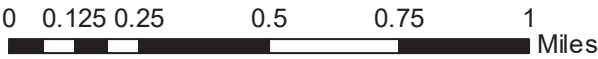
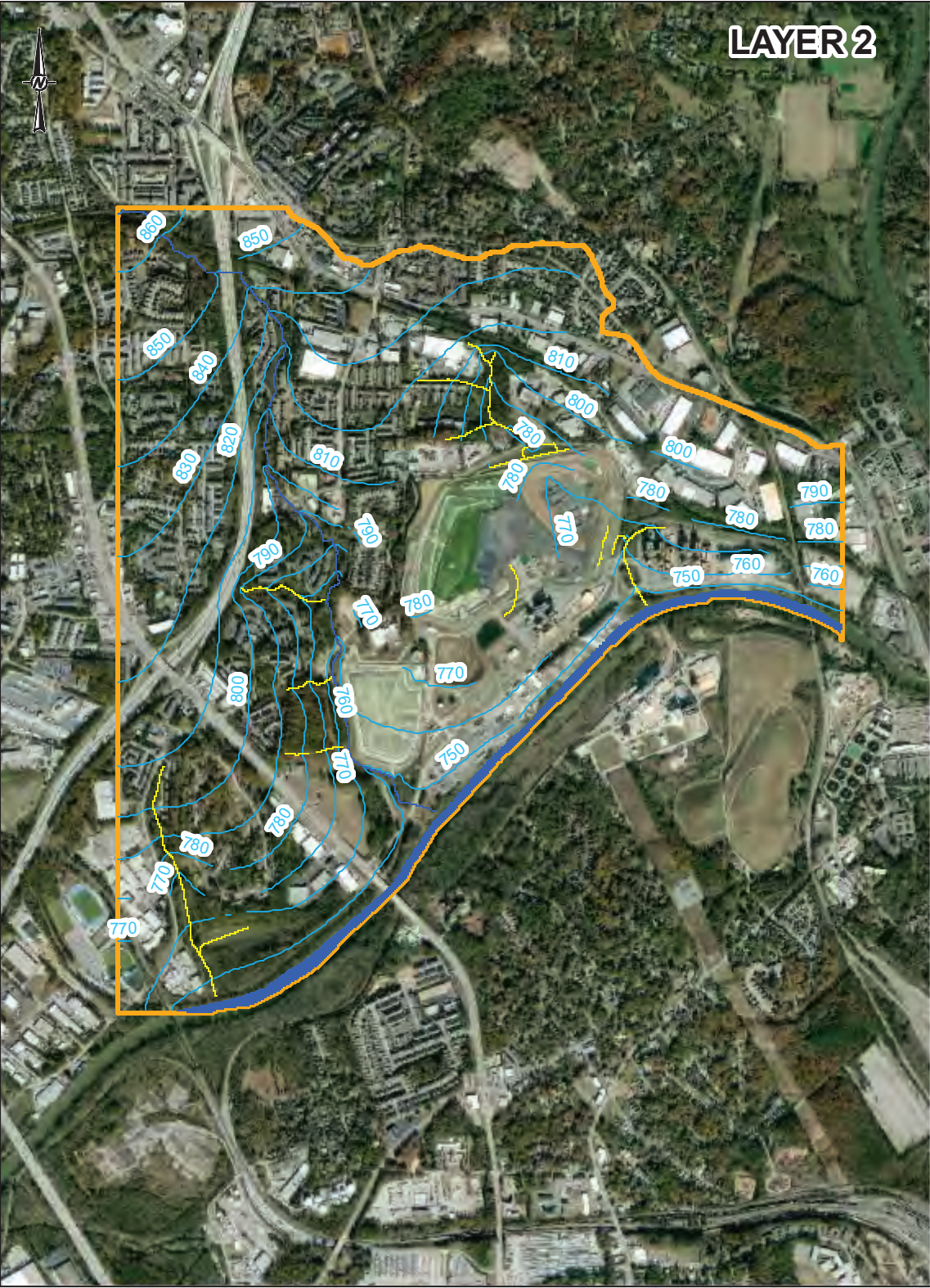


NOTES:

LEGEND

- River Boundary Conditions
- Drain Boundary
- Groundwater Elevation Contour (ft)
- Model Area

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY



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YYYY-MM-DD 2020-02-26

DESIGNED CB

PREPARED JRJ

CHECKED CB

REVIEWED/APPROVED CB



PROJECT  
PLANT MCDONOUGH

TITLE  
**Closure Conditions Model Conditions Water Table and Model  
Layer 2 Modeled Groundwater Elevation Contours**

PROJECT NO.  
1661841

PHASE  
3

REV.  
0

FIGURE  
**4-2**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI 11



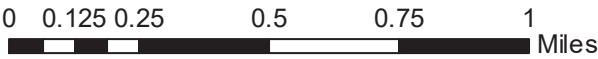
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LEGEND

- River Boundary Conditions
- Drain Boundary
- Groundwater Elevation Contour (ft)
- Model Area

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DESIGNED CB

PREPARED JRJ

CHECKED CB

REVIEWED/APPROVED CB



PROJECT  
PLANT MCDONOUGH

TITLE  
**Closure Conditions Model Conditions Model Layer 3 and 4  
Modeled Groundwater Elevation Contours**

PROJECT NO.  
1661841

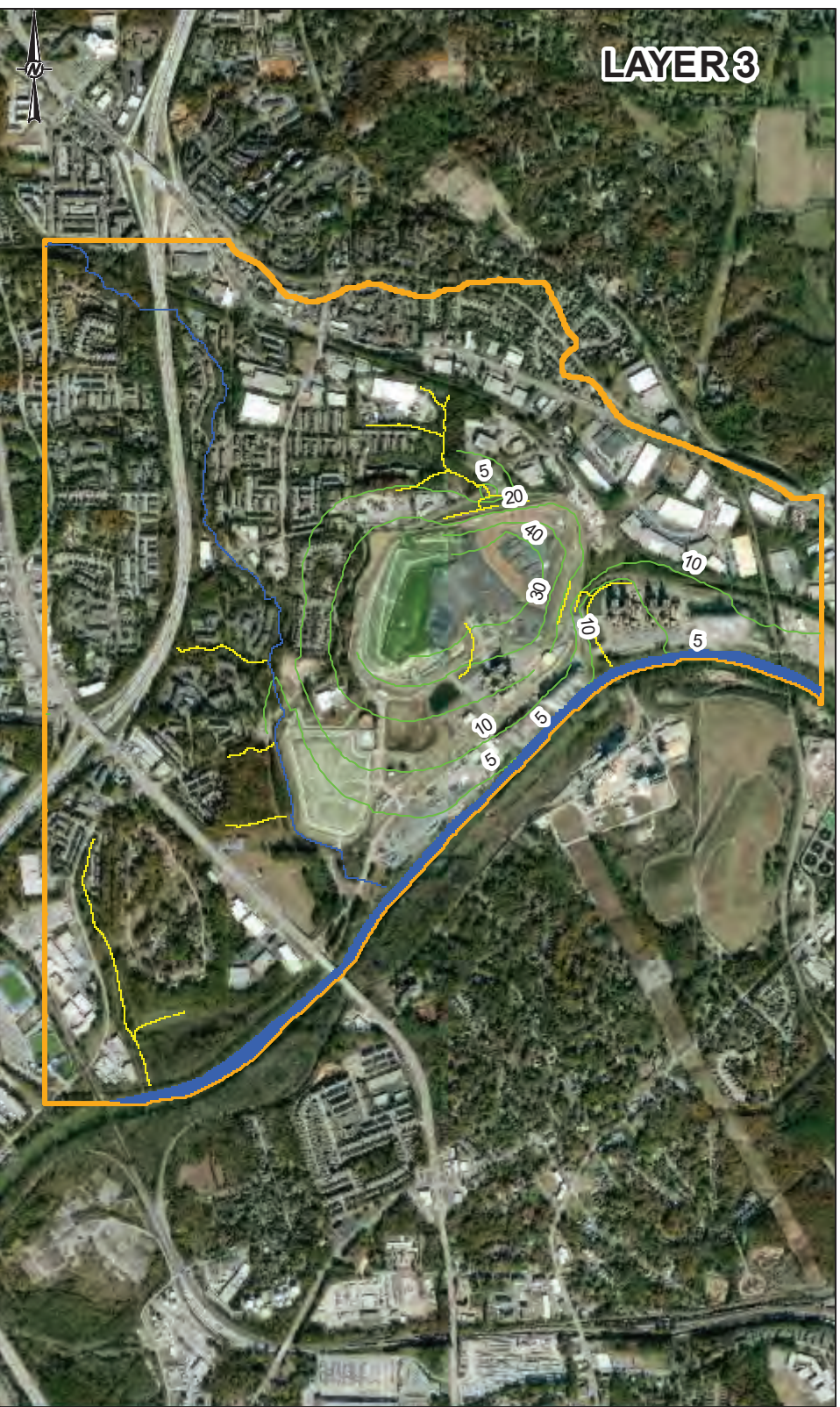
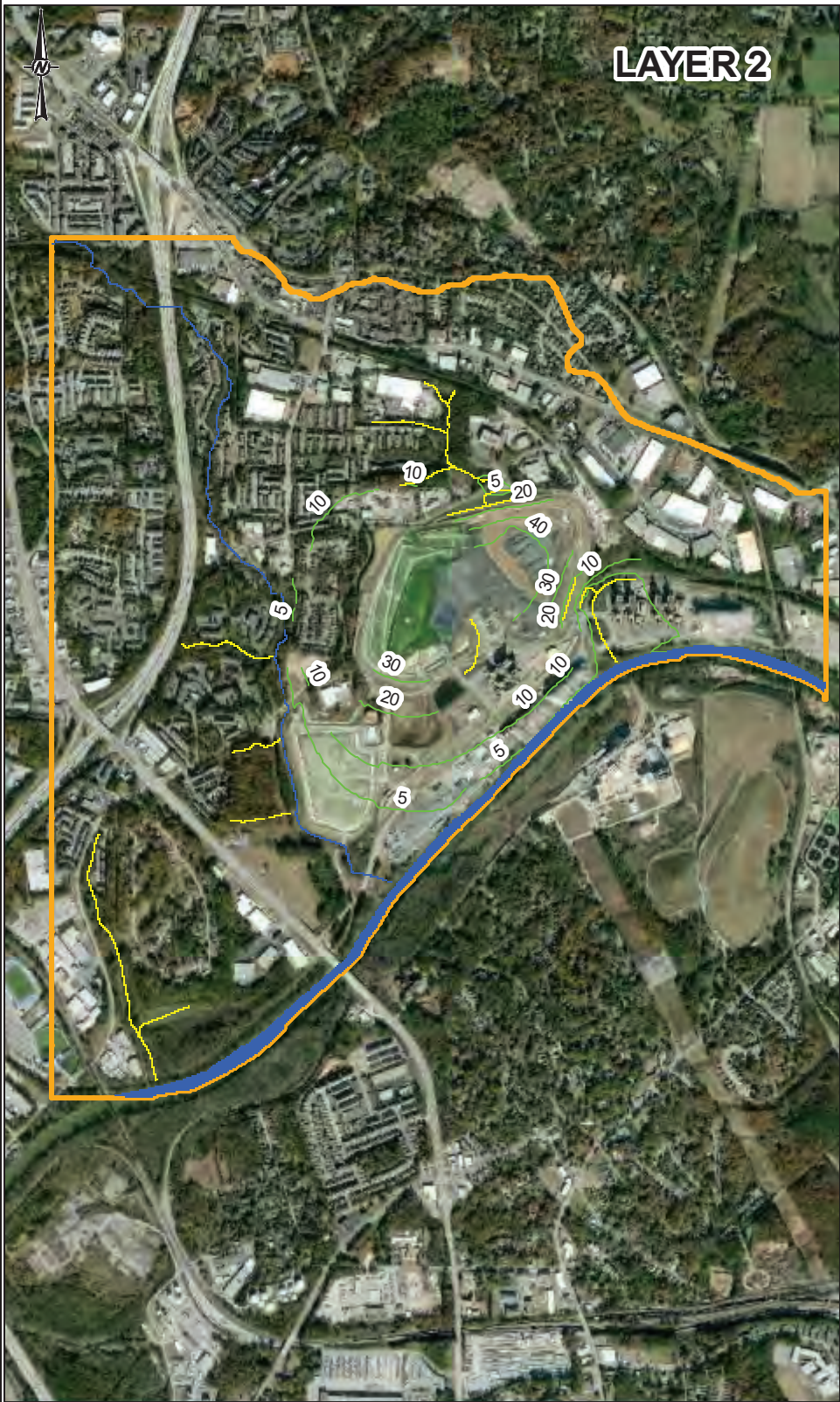
PHASE  
3

REV.  
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FIGURE  
**4-3**

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI 11







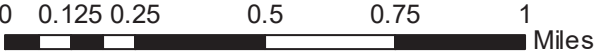


NOTES:

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LEGEND

-  River Boundary Conditions
-  Drain Boundary
-  Drawdown (ft)
-  Model Area



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PREPARED	JRJ
CHECKED	CB
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PROJECT  
PLANT MCDONOUGH

TITLE  
**Closure Conditions Model versus Baseline Modeled  
Groundwater Elevation Change**

PROJECT NO. 1661841	PHASE 3	REV. 0	FIGURE <b>4-4</b>
------------------------	------------	-----------	----------------------





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**REPORT**

# Three-Dimensional Numerical Groundwater Modeling Summary Report Addendum

*Georgia Power - Plant McDonough, Cobb County, Georgia*

Submitted to:

**Georgia Power**

Environmental Affairs  
241 Ralph McGill Boulevard  
Atlanta, Georgia 30308

Submitted by:

**Golder Associates Inc.**

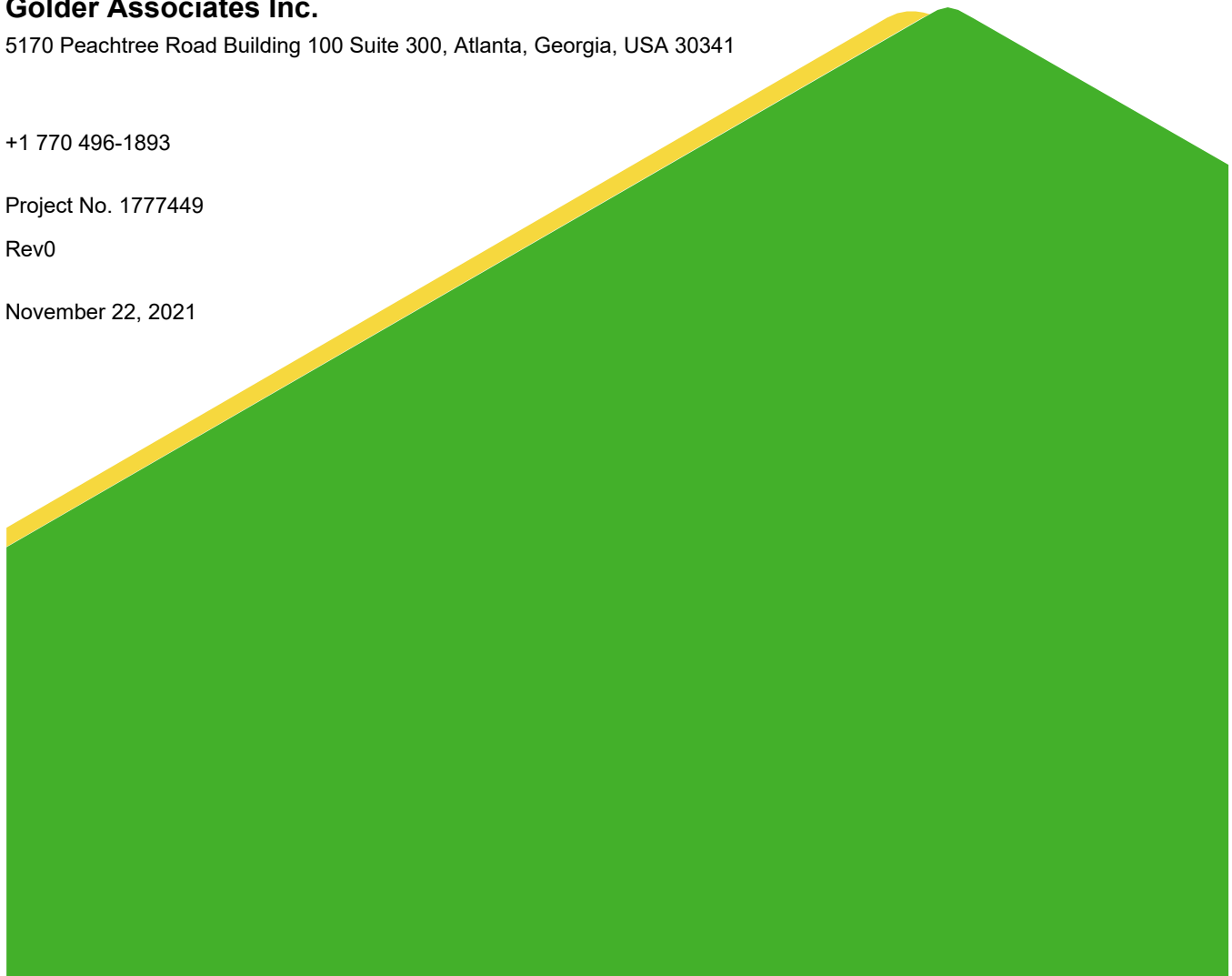
5170 Peachtree Road Building 100 Suite 300, Atlanta, Georgia, USA 30341

+1 770 496-1893

Project No. 1777449

Rev0

November 22, 2021





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- Figure 3 – Closure Conditions Model Domain Groundwater Table
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## 1.0 INTRODUCTION

This *Three-Dimensional Numerical Groundwater Modeling Summary Report Addendum* (Addendum) was prepared by Golder Associates Inc. (Golder) to document updates to the steady state numerical groundwater flow model associated with the Advanced Engineering Method (AEM) at CCR Unit Ash Pond 1 (AP-1) at the Georgia Power Company (Georgia Power) Plant McDonough-Atkinson (Plant McDonough; Site) located in Cobb County, Georgia (see Figure 1).

AP-1 is currently capped and in the process of closure to minimize infiltration and erosion and to meet or exceed the requirements of § 257.102(d)(3)(ii). As discussed in the Plant McDonough AP-1 Solid Waste Handling Permit Application submitted to the Georgia Environmental Protection Division (EPD) in September 2021 (Golder, 2021a), the AP-1 closure will include an AEM consisting of a fully encompassing subsurface vertical barrier wall (barrier wall) constructed from the ground surface to the top of partially weathered rock (PWR). Predicted post-closure groundwater flow conditions for AP-1 were previously simulated using a Closure Model that is documented in the Model Report submitted to EPD in 2020 as an Appendix to the Hydrogeological Assessment Report (HAR) (Golder, 2020a). The HAR was submitted to EPD as Revision 03 in September 2021 (Golder, 2021b).

This Addendum documents revised post-closure groundwater flow model predictions based on updates to the AP-1 closure-by-removal area grading and subsurface barrier wall alignment, as documented in the Plant McDonough-Atkinson Coal Combustion Residual (CCR) Surface Impoundments (CCR Unit AP-1 and CCR Unit AP-2, CCR Unit AP-3/4) Permit applications (AP-1 Permit (Golder, 2021a) and AP-2, AP-3/4 Permit (Golder, 2020b with 2021 revisions). The updated model is hereafter referred to as the Addendum Closure Model.

The Addendum Closure Model, which focuses on AP-1, also includes updates to AP-2 and AP-3/4 closure designs (also located in the Closure Model domain) based on the November 2021 AP-2, AP-3/4 Permit application Response to EDP Comments and revised Closure Drawings. Revised closure design for AP-2 and AP-3/4 include backfilling of AP-2 with soil, minor grading changes in the CCR excavation portion of AP-3/4, and the as-built depth of the AP-3/4 underdrain.

The following sections provide a brief overview of the previously submitted Closure Model and describe model updates and results of the Addendum Closure Model.

### 1.1 Closure Model

The conceptual site model (CSM) and Baseline and Closure Models construction, calibration, and results were previously documented in the *Three-Dimensional Numerical Groundwater Modeling Summary Report Revision 3* (Model Report), included as Appendix A of the HAR (Golder, 2021b).

The Baseline and Closure Models presented in the Model Report are as follows:

- The Baseline Model is a calibrated groundwater flow model that simulates August 2016 steady state flow conditions, after the initial cover installation at AP-1 and prior to the final cover installation at AP-3/4. This model serves as the basis for the predictive Closure Model.
- The Closure Model is a modified version of the Baseline Model that simulates final cover installation at AP-1 over a consolidated CCR footprint and installation of a fully encompassing barrier wall reflecting the original 2018 AP-1 Permit Closure Design barrier alignment and depth; closure of AP-2 by removing CCR



without backfilling; and installation of final cover at AP-3/4 over a consolidated footprint and a proposed AEM underdrain.

## 1.2 Addendum Closure Model

The objective of this addendum is to document the results of the Addendum Closure Model. The Addendum Closure Model updates focus primarily on the incorporation of the updated barrier wall design for AP-1, but they also include updates to cover alignments and/or grading at AP-2 and AP-3/4. Updates incorporated into the Addendum Closure Model are as follows:

- AP-1: Updated geometry of the final cover system and updated alignment of the fully encompassing subsurface barrier wall based on the November 2021 Closure Drawings as part of the Permit application. The proposed barrier wall will extend from the ground surface (top of Model Layer 1) to the top of PWR (Model Layer 3) along the alignment from the 2021 AP-1 Permit application, as shown in Figure 2.  
  
The barrier wall is simulated in the Addendum Closure Model using Horizontal-Flow-Barrier (HFB) model boundary conditions and are assigned the same wall thickness and hydraulic conductivity as in the previous Closure Model, which is consistent with the expected wall construction.
- AP-2: Updated grading based on backfilling with soil. The ground surface (top of Layer 1) in the model within AP-2 is updated to reflect backfilling with soil<sup>1</sup>.
- AP-3/4: Updated alignments for the final cover system and the underdrain AEM to reflect as-built conditions<sup>2</sup>. The AP-3/4 AEM underdrain is simulated using drain model boundary conditions, and the drain stage and hydraulic conductivity are updated to reflect as-built conditions.

Additionally, all areas with final cover are assigned a recharge of zero, consistent with the Closure Model, and all AP-1 CCR (Layer 1) outside the limits of the 2021 Permit barrier wall alignment were removed from the Addendum Closure Model consistent with the proposed barrier wall construction plans.

Results of the Addendum Closure Model are compared to results of the Baseline and Closure Models documented in the 2020 Model Report. The following metrics are used to evaluate AP-1 and AP-3/4 post-closure predictions<sup>3</sup>: (i) maximum height of the potentiometric surface above the bottom of AP-1; (ii) volume of CCR below the potentiometric surface; (iii) percent reduction in volume of CCR below the potentiometric surface; and (iv) percent reduction in AP-1 downgradient groundwater flow.

---

<sup>1</sup> AP-2 soil backfill was assigned the same properties as Overburden (see Model Report). Flow fields proximal to AP-2 are unchanged as compared to the Closure Model.

<sup>2</sup> AP-3/4 temporary dewatering wells are not included in the Addendum Closure Model, as they will only be used during construction and for a temporary period at the beginning of post closure. This approach is consistent with the Closure Model submitted to EPD in 2020.

<sup>3</sup> The Addendum Closure Model predicts that AP-3/4 CCR will desaturate due to the presence of the underdrain AEM in the as-built configuration.



## 2.0 PREDICTIVE SIMULATION AND RESULTS

Simulated model-wide water table elevation contours (10-ft contour interval) for the Closure Model and Addendum Closure Model are presented in Figure 3. Predicted post-closure water levels across the Site are similar in the Closure Model and Addendum Closure Model, as depicted in Figure 3.

Review of simulated more detailed groundwater elevation contours (2-ft contour interval) near AP-1 in Layers 1 through 4 (Figures 4 through 7, respectively) indicates water levels in AP-1 decreased by approximately one to two feet in the Addendum Closure Model compared to the Closure Model.

The predicted reduction in saturated volume of AP-1 CCR in the Addendum Closure Model as compared to the Baseline Model is 31%, as summarized in Table 1. The predicted reductions in simulated flow across the western and southern side of AP-1 in overburden (Layer 2) in the Addendum Closure Model as compared to the Baseline Model are 84% and 72%, respectively, as summarized in Table 1<sup>4</sup>. The predicted reduction in saturated volume of AP-3/4 CCR in the Addendum Closure Model as compared to the Baseline Model is 100%.

Plant McDonough CCR Unit Addendum Closure Conditions are predicted to reduce the potentiometric surface elevation within the units, the volume of saturated CCR, and flow across the Unit boundaries including the elimination of saturation and flow across CCR in Unit AP-3/4. These reductions are more pronounced in the Addendum Closure Model and result in more favorable predicted post-closure conditions with respect to closure objectives.

## 3.0 REFERENCES

Golder, 2020a. Appendix A -Three-Dimensional Numerical Groundwater Modeling Summary Report, Revision 5, Golder Associates Inc. November 2020.

Golder, 2020b. Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-2, Combined CCR Unit AP-3/4) Cobb County, Georgia Part A Section 2 – Permit Application Revision 1, Golder Associates Inc. November 2020, with 2021 Revisions.

Golder, 2021a. Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-1) Cobb County, Georgia Part A Section 2 – Permit Application, Golder Associates Inc. September 2021.

Golder, 2021b. Hydrogeologic Assessment Report, Plant McDonough-Atkinson Ash Pond 1, Ash Pond 2, and Ash Pond 3/4, Revision 3, Golder Associates Inc. September 2021.

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<sup>4</sup> Flow estimates were calculated in the model.



**TABLE**



TABLE 1: SUMMARY OF MODELING RESULTS  
Groundwater Model Addendum  
Plant McDonough-Atkinson

Model Scenario	CCR Unit Conditions	Maximum Height of Potentiometric Surface Above Bottom of Unit (feet)	Volume of CCR Below the Potentiometric Surface (cubic yards)	Percent (%) Reduction in Volume of CCR Below the Potentiometric Surface	Percent (%) Reduction in Downgradient Groundwater Flux Across A Transect	Percent (%) Reduction in Downgradient Groundwater Flux Across B Transect
CCR Unit AP-1 Results						
Baseline	Cover installed	16.0	205,800	-	-	-
Closure	Cover installed, fully encompassing barrier wall	13.0	163,100	21%	74%	70%
Addendum Closure	Cover installed, fully encompassing barrier wall with updated alignment	12.0	142,300	31%	84%	72%
CCR Unit AP-3/4 Results						
Baseline	AP-3/4 Pre-Closure Conditions	49.2	1,528,300	-	-	-
Closure <sup>(4)</sup>	Consolidated CCR Footprint, Cover installed, AEM Underdrain	1.0	200	99.99%	~100%	
Addendum Closure	Consolidated CCR Footprint, Cover installed, AEM Underdrain with As-Built Conditions	0.0	0	100%	100%	

**Notes:**

1. These values were obtained from groundwater flow modeling results. It is noted that groundwater flow models are necessarily simplified mathematical representations of complex natural systems. Because of this, all groundwater models have limits to their accuracy.

2. These model results were intended for use as relative comparisons between scenarios, and not as precise predictions of post-closure conditions.

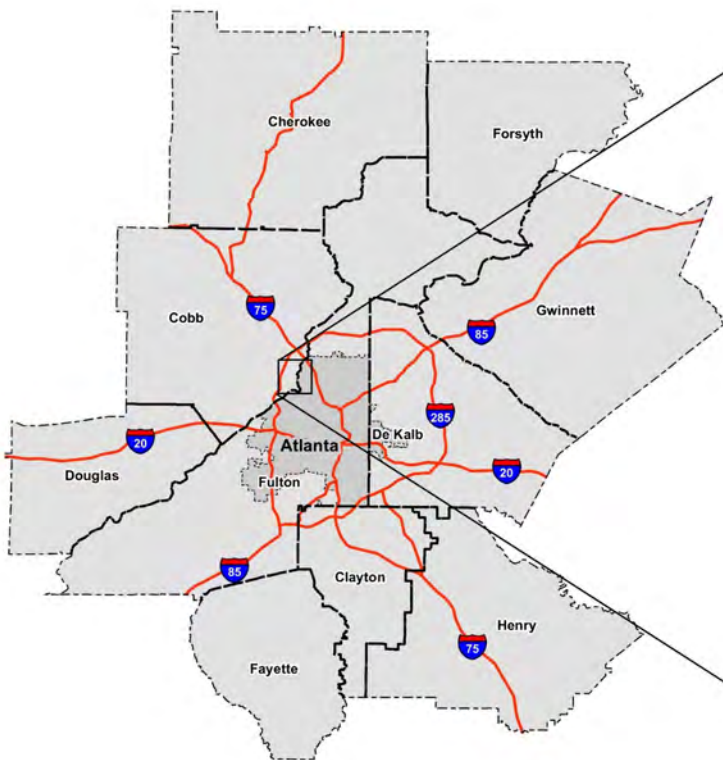
3. Flux estimates were calculated in the model as the volume of water passing through a vertical plane per unit time. Transect locations are depicted in Figure 8. AP-3/4 downgradient flux is shown to reduce by 100% due to the complete desaturation of the CCR in AP-3/4.

4. The Closure Model indicated de minimis saturated CCR in AP-3/4 because of the geometric conceptualization of the underdrain model boundary condition. The Addendum Closure Model boundary conditions represent the as-built underdrain condition and geometry and predicts complete de-saturation of CCR in AP-3/4.

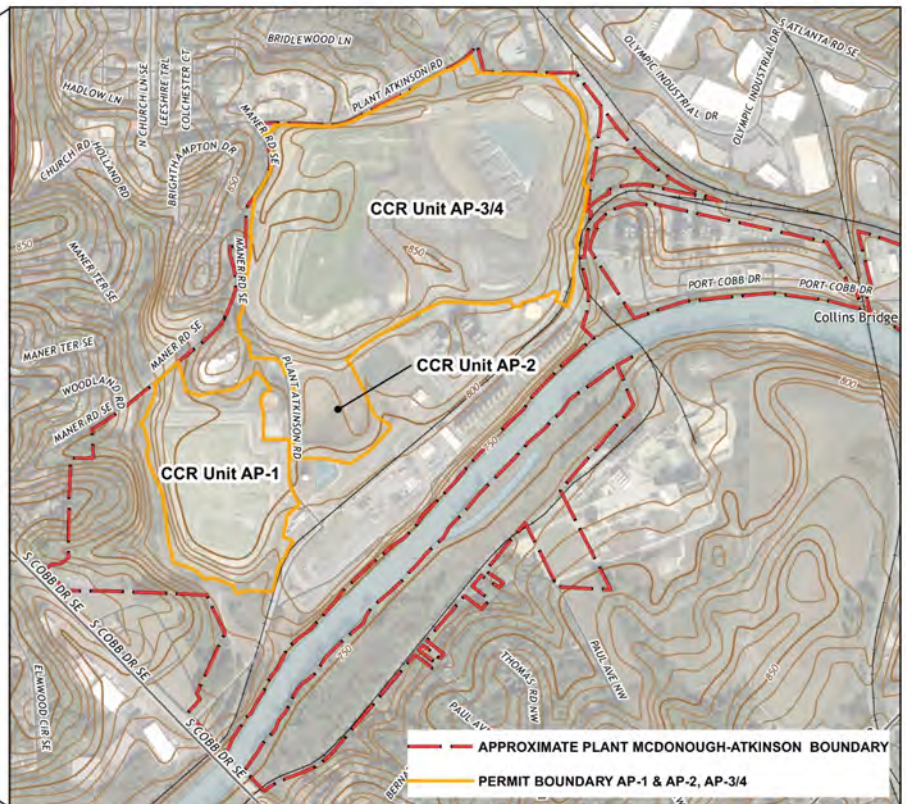


## FIGURES



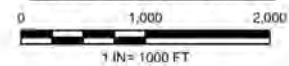


**SITE VICINITY MAP**



REF: USGS 7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE:  
MABLETON, GA 1992 & NORTHWEST ATLANTA, GA 1993

**SITE LOCATION MAP**



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PLANT MCDONOUGH - ATKINSON  
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SITE LOCATION MAP

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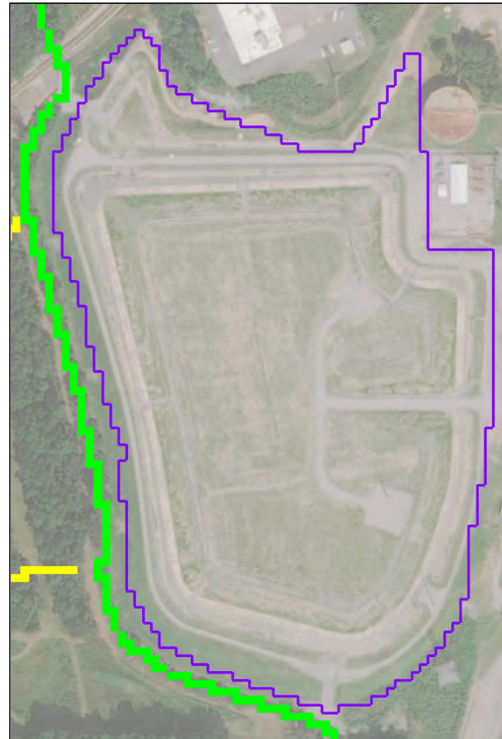
FIGURE  
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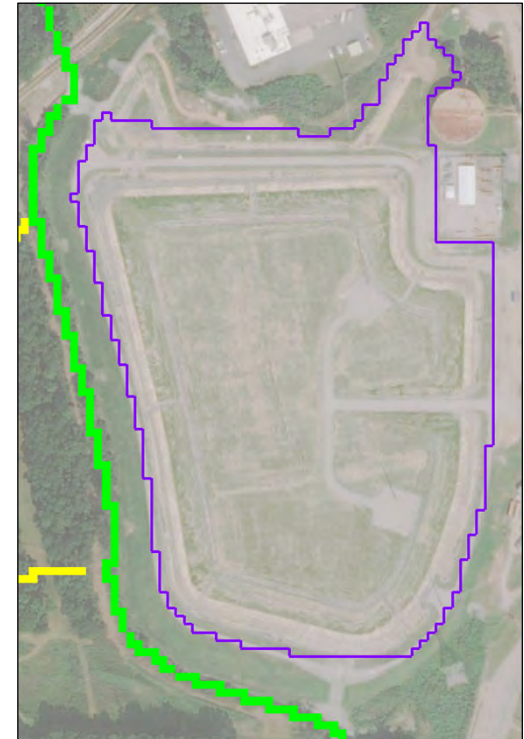
**BASELINE MODEL**



**CLOSURE MODEL**



**ADDENDUM CLOSURE MODEL**



**LEGEND**

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION

**NOTES**

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

**REFERENCES**

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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AP-1 MODEL BOUNDARY CONDITIONS

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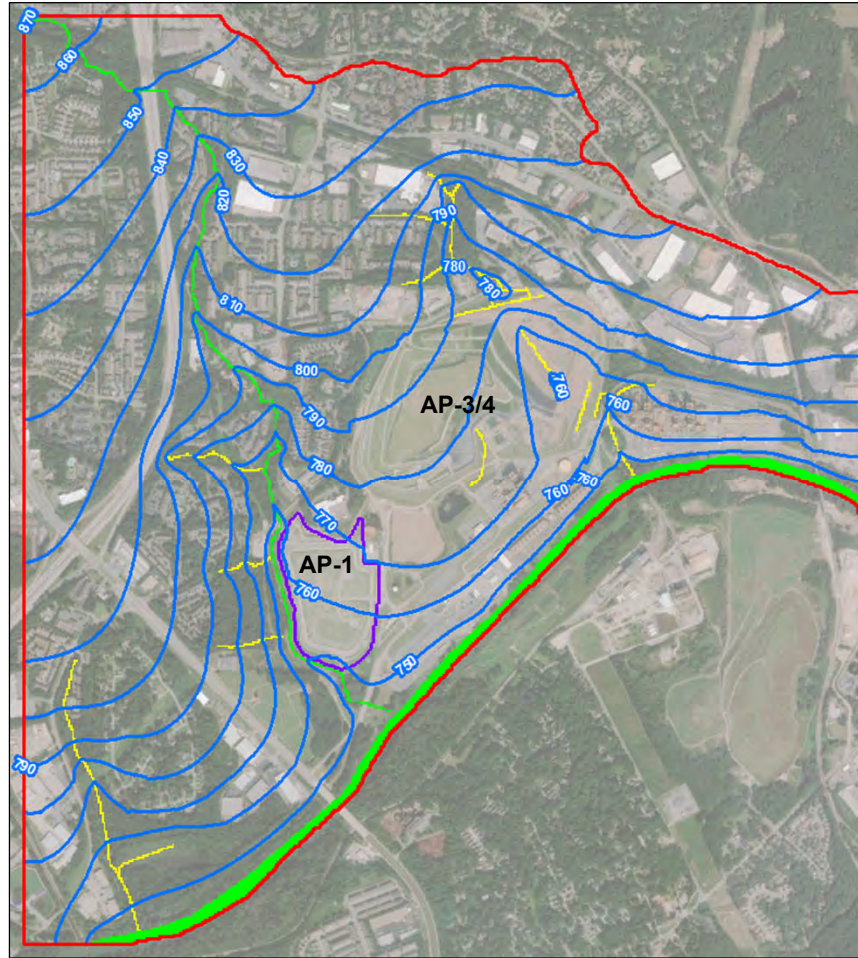
FIGURE  
2



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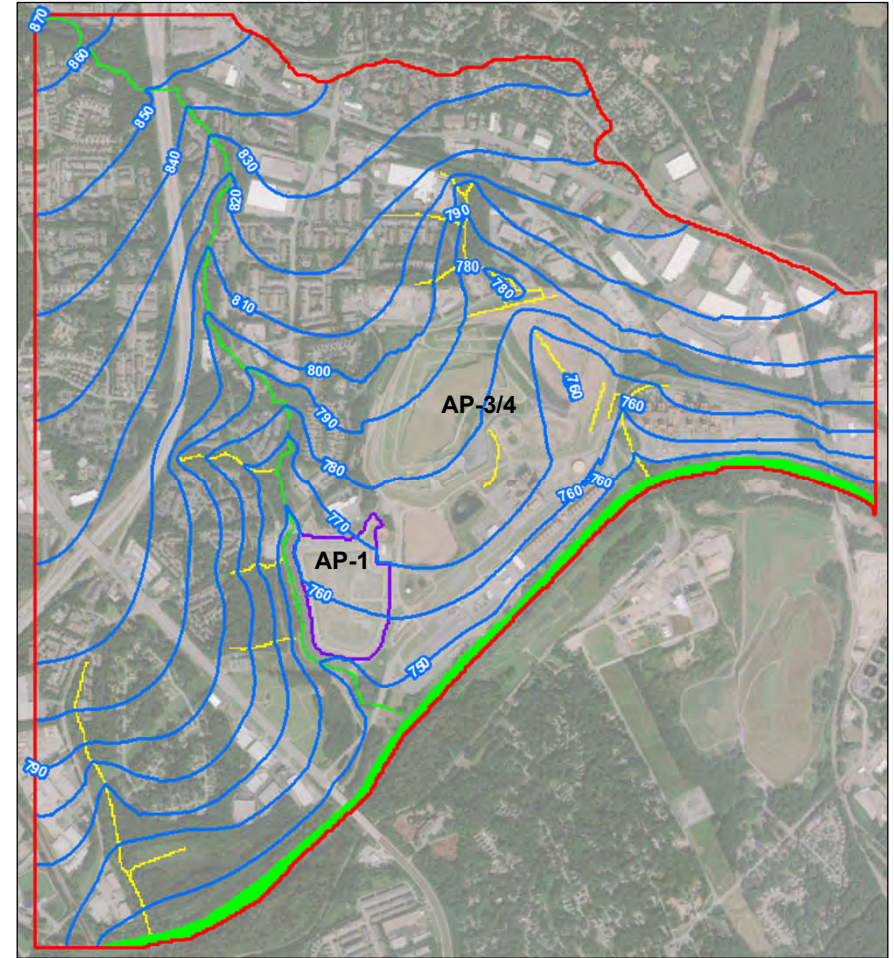


## CLOSURE MODEL



CONTOUR INTERVAL = 10 FT

## ADDENDUM CLOSURE MODEL



CONTOUR INTERVAL = 10 FT

### LEGEND

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- ACTIVE MODEL DOMAIN
- GROUNDWATER ELEVATION CONTOUR

### NOTES

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

### REFERENCES

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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TITLE  
CLOSURE CONDITIONS MODEL DOMAIN GROUNDWATER  
TABLE

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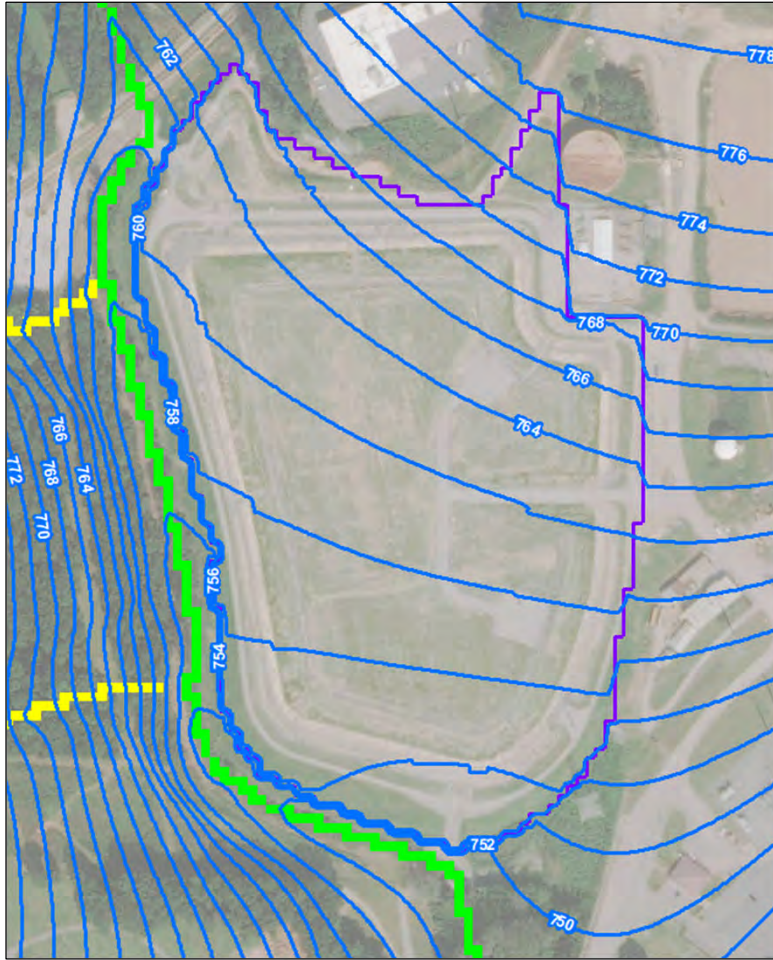
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FIGURE  
3



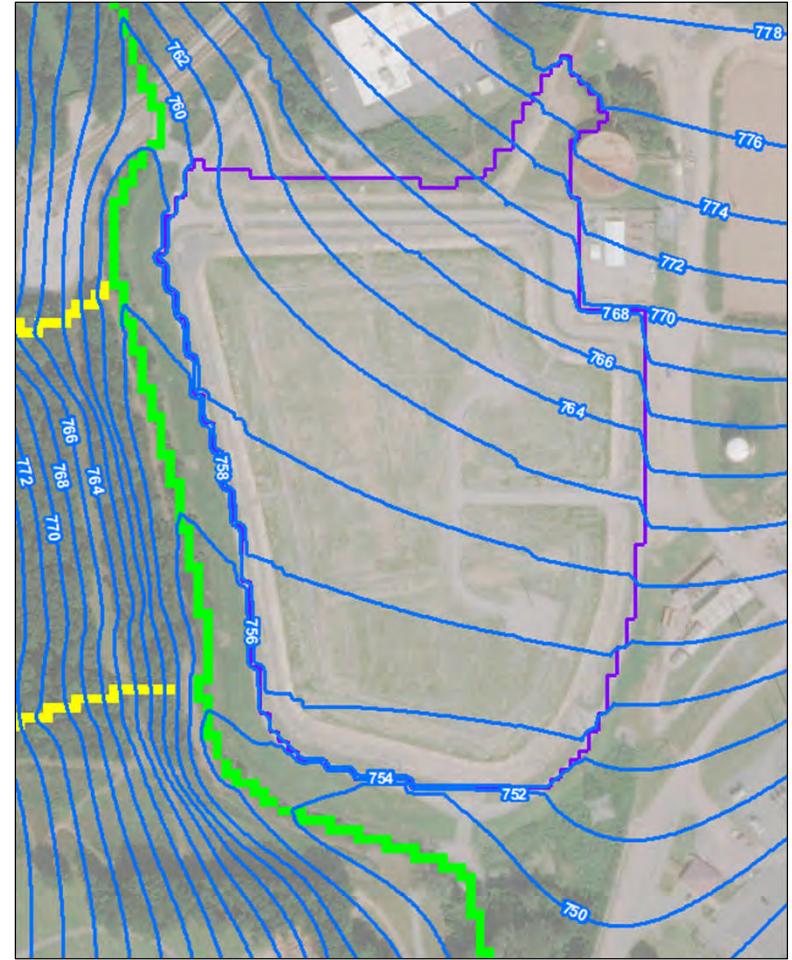


## CLOSURE MODEL (LAYER 1)



CONTOUR INTERVAL = 2 FT

## ADDENDUM CLOSURE MODEL (LAYER 1)



CONTOUR INTERVAL = 2 FT

### LEGEND

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- GROUNDWATER ELEVATION CONTOUR

### NOTES

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

### REFERENCES

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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TITLE  
AP-1 CLOSURE CONDITIONS GROUNDWATER TABLE

PROJECT NO.  
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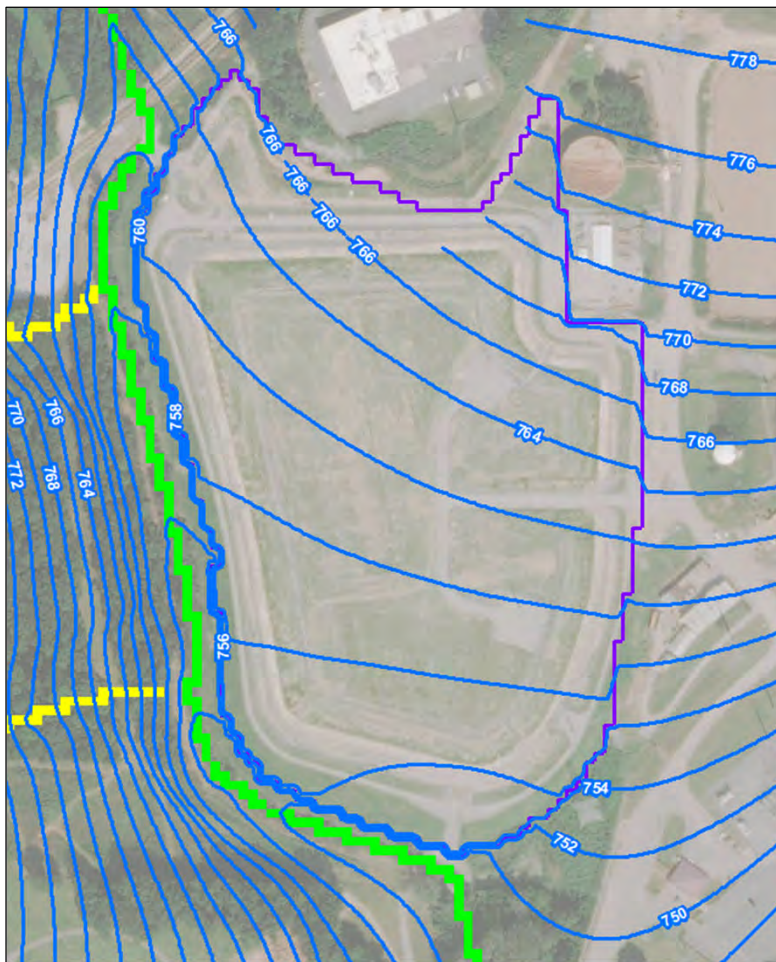
FIGURE  
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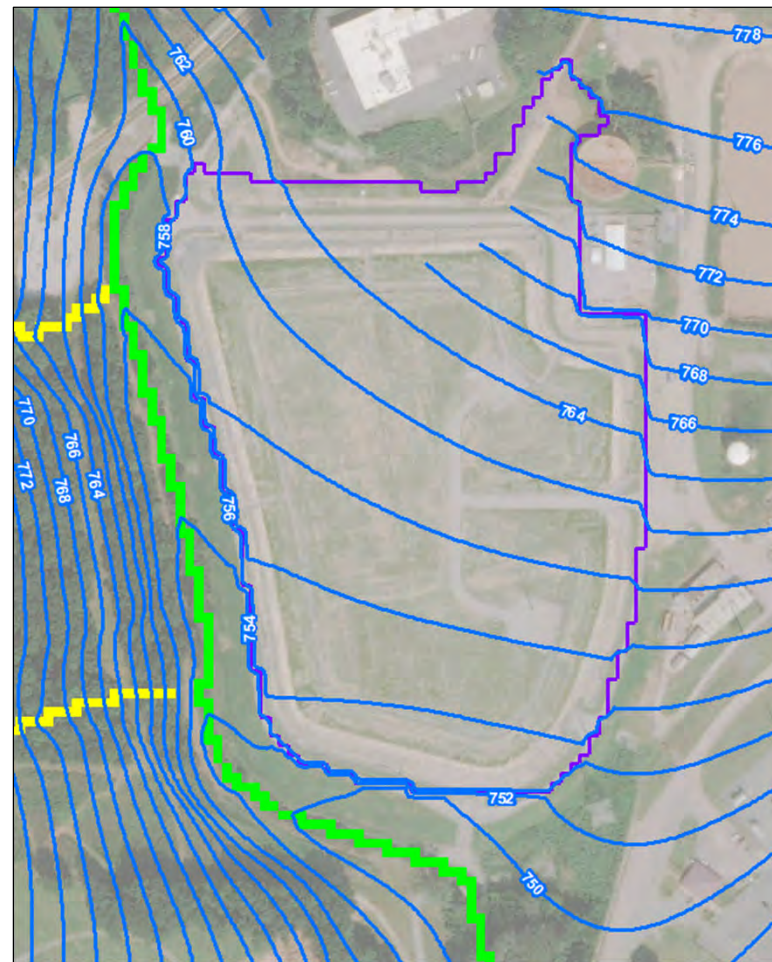


**CLOSURE MODEL (LAYER 2)**



CONTOUR INTERVAL = 2 FT

**ADDENDUM CLOSURE MODEL (LAYER 2)**



CONTOUR INTERVAL = 2 FT



**LEGEND**

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- GROUNDWATER ELEVATION CONTOUR

**NOTES**

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

**REFERENCES**

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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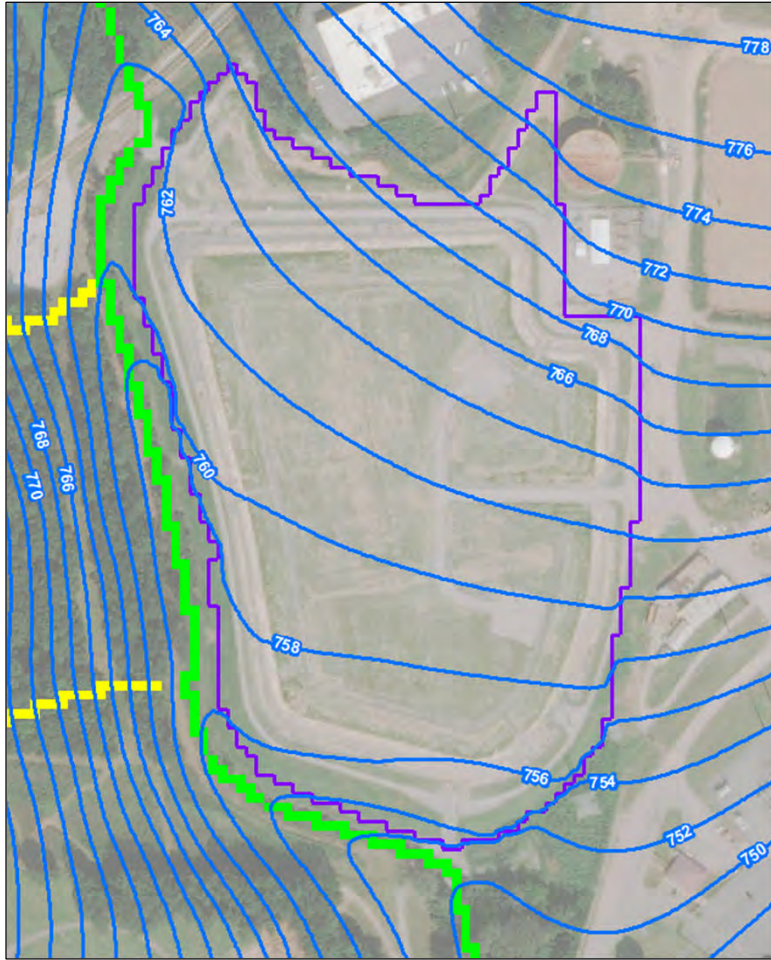


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AP-1 CLOSURE CONDITIONS GROUNDWATER ELEVATION  
(LAYER 2)

PROJECT NO. 1777449	CONTROL -	REV. 0	FIGURE 5
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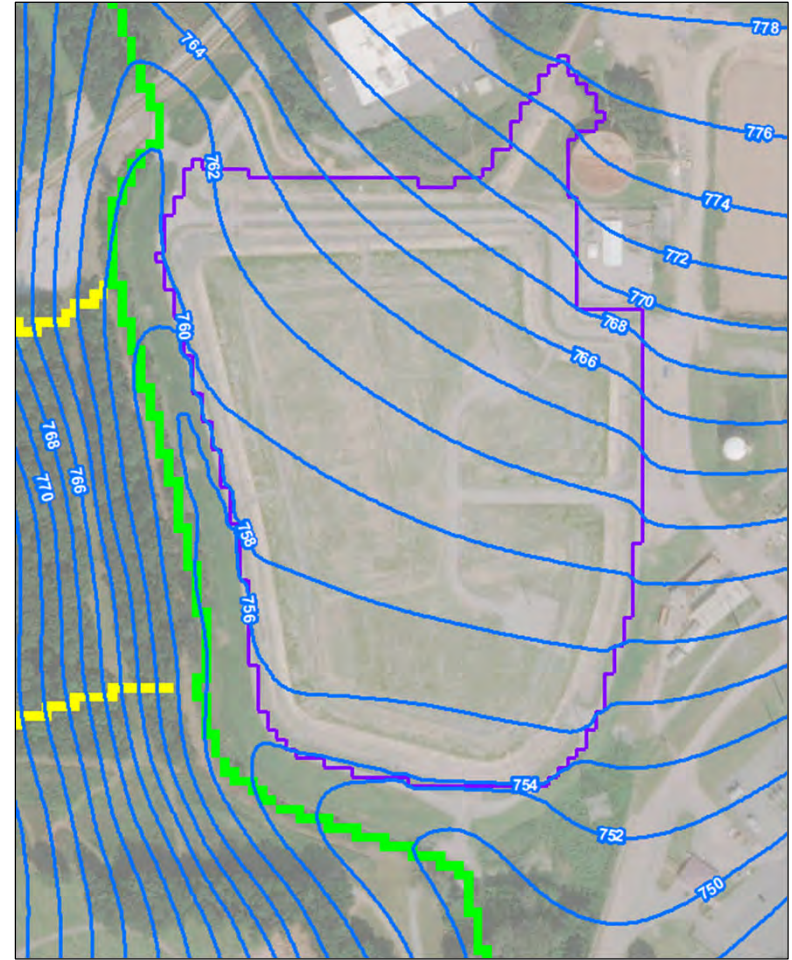


### CLOSURE MODEL (LAYER 3)



CONTOUR INTERVAL = 2 FT

### ADDENDUM CLOSURE MODEL (LAYER 3)



CONTOUR INTERVAL = 2 FT



#### LEGEND

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- GROUNDWATER ELEVATION CONTOUR

#### NOTES

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

#### REFERENCES

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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GROUNDWATER MODEL ADDENDUM



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AP-1 CLOSURE CONDITIONS GROUNDWATER ELEVATION  
(LAYER 3)

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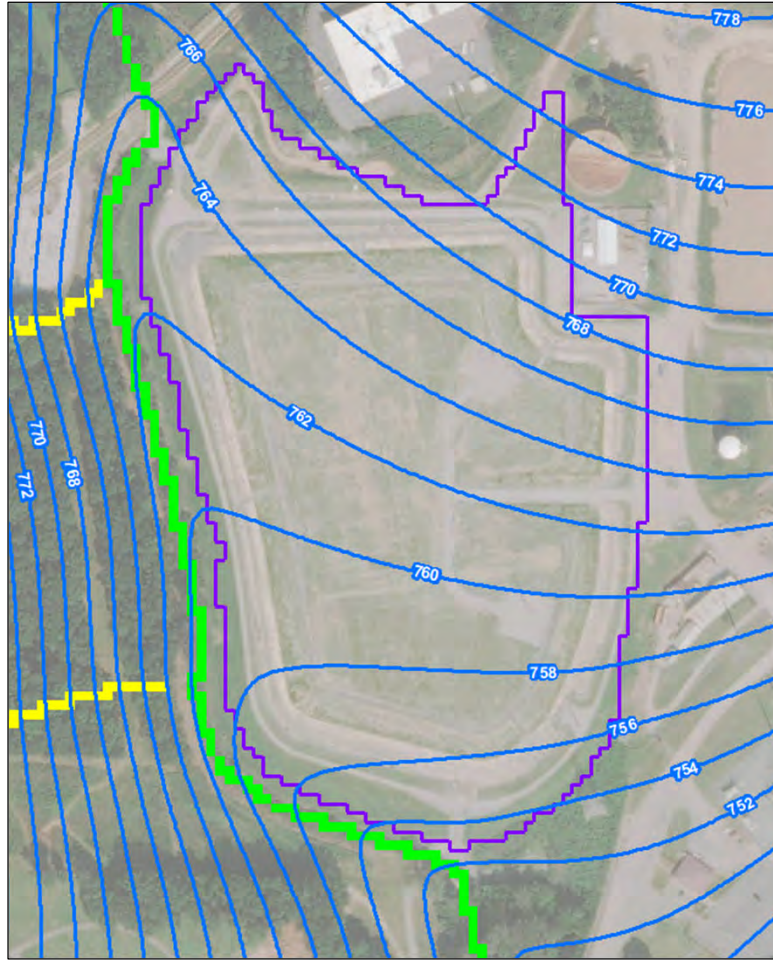
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FIGURE  
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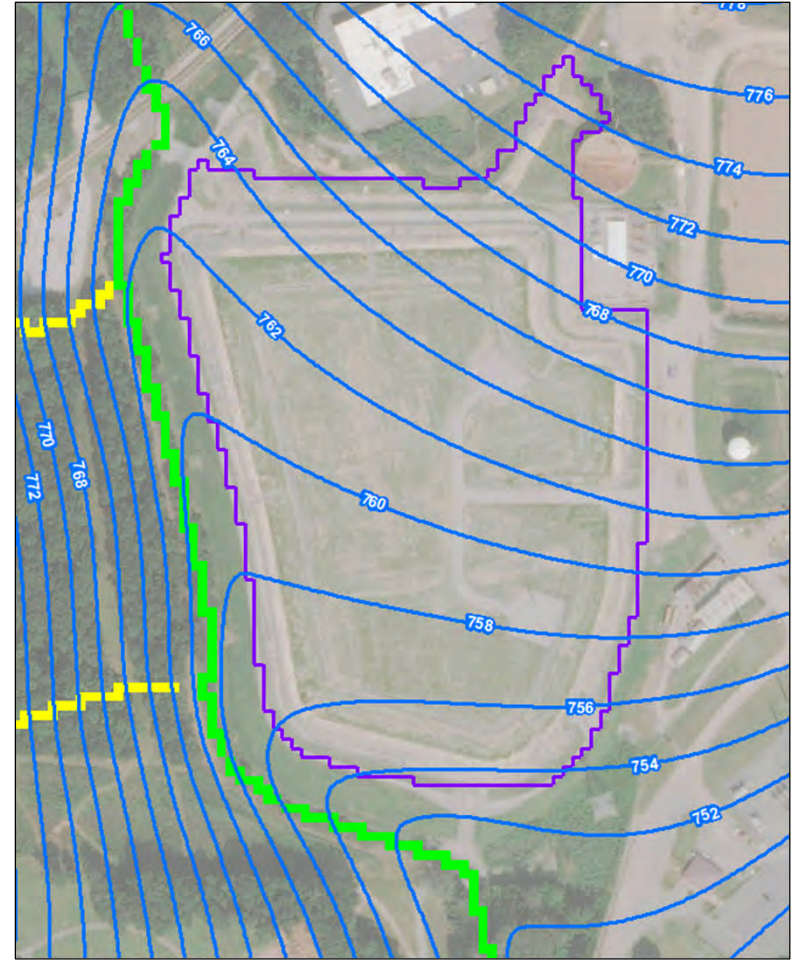


## CLOSURE MODEL (LAYER 4)



CONTOUR INTERVAL = 2 FT

## ADDENDUM CLOSURE MODEL (LAYER 4)



CONTOUR INTERVAL = 2 FT

0' 200' 400'  
SCALE IN FEET

### LEGEND

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- GROUNDWATER ELEVATION CONTOUR

### NOTES

1. GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

### REFERENCES

1. HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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GROUNDWATER MODEL ADDENDUM



TITLE  
AP-1 CLOSURE CONDITIONS GROUNDWATER ELEVATION  
(LAYER 4)

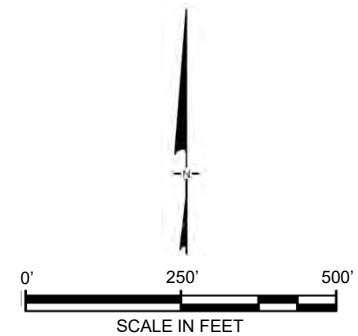
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FIGURE  
7





#### LEGEND

- DRAIN BOUNDARY CONDITION
- RIVER BOUNDARY CONDITION
- BARRIER WALL BOUNDARY CONDITION
- FLUX TRANSECT A-A'
- FLUX TRANSECT B-B'

#### NOTES

- GROUNDWATER MODEL CONSTRUCTION AND CALIBRATION ARE DESCRIBED IN REFERENCE 1.

#### REFERENCES

- HYDROGEOLOGICAL ASSESSMENT REPORT GEORGIA POWER COMPANY PLANT MCDONOUGH-ATKINSON, APPENDIX A, GOLDER ASSOCIATES INC. 2021.

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PLANT MCDONOUGH - ATKINSON  
GROUNDWATER MODEL ADDENDUM



TITLE  
AP-1 GROUNDWATER FLOW TRANSECT LOCATIONS

PROJECT NO. 1777449	CONTROL -	REV. 0	FIGURE 8
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APPENDIX C

# Drillers Bond



PERFORMANCE BOND FOR WATER WELL CONTRACTORSAND DRILLERS

Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS.

That we SOUTHERN COMPANY SERVICES, INC., as Principal, and SAFECO INSURANCE COMPANY OF AMERICA, as Surety, are held and firmly bound unto the Director of the Environmental Protection Division ("Director"), Department of Natural Resources, State of Georgia and his successor or successors in office, as Obligees, in the full sum of TEN THOUSAND & No/100 Dollars (\$10,000.00), for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Water Well Standards Act of 1985 (Ga. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption, or modification.

This bond shall be effective from date of issuance or, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obligees; provided that the rights of the Obligees and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2003

IN WITNESS WHEREOF the Principal and Surety have caused these presents to be duly signed and sealed, this 30th day of October, 2001.

2001 -



Principal, By: [Signature] (L.S.)

Title: SAM H. DABBS, JR.

ASSISTANT SECRETARY

Approved as to sufficiency  
and accepted:

Environmental Protection  
Division,

Department of Natural  
Resources

SAFECO INSURANCE COMPANY OF AMERICA

Surety, By: Sandra J. Mathis (L.S.)

Sandra J. Mathis, Attorney-in-Fact





SAFECO

POWER  
OF ATTORNEY

SAFECO INSURANCE COMPANY OF AMERICA  
GENERAL INSURANCE COMPANY OF AMERICA  
HOME OFFICE: SAFECO PLAZA  
SEATTLE, WASHINGTON 98185

No. 6724

## KNOW ALL BY THESE PRESENTS:

That SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby appoint  
\*\*\*\*\*SANDRA S. CARTER; JUDY GAY CERA; GARY D. EKLUND; JUDY S. FLEMING; VIRGINIA B. MCMAHUS; BARBARA S. MACARTHUR; SANDRA J. MATHEIS;  
EDWARD L. MITCHELL; NANCY NIX; BARBARA THOMPSON; CYNTHIA I. RODOLPH; Atlanta, Georgia\*\*\*\*\*

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA have each executed and attested these presents

this 2nd day of February, 2001

R.A. PIERSON, SECRETARY

BOH A. DICKEY, PRESIDENT

## CERTIFICATE

Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA  
and of GENERAL INSURANCE COMPANY OF AMERICA:

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA  
and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

- (i) The provisions of Article V, Section 13 of the By-Laws, and
- (ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
- (iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof."

I, R.A. Pierson, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

this 30th day of October, 2001



R.A. PIERSON, SECRETARY



AND DRILLERS

BOND NO. 1450-17-087281

WATER WELL CONTRACTOR OR DRILLER GORE, INC.

KNOW ALL MEN BY THESE PRESENTS.

That we Gore, Inc., as Principal,  
and Employers Insurance of Wausau, A Mutual Company, as Surety,  
are held and firmly bound unto the Director of the Environmental  
Protection Division ("Director"), Department of Natural Resources,  
State of Georgia and his successor or successors in office, as Obligor,  
in the full sum of Ten Thousand and No/100 Dollars (\$10,000.00)  
for the payment of which well and truly to be made, we bind ourselves,  
our heirs, executors, administrators, successors and assigns, jointly  
and severally, by these presents.

WHEREAS, the Water Well Standards Act of 1985 (Ga. Laws 1985,  
p. 1192) (the "Act") requires that water well contractors and drillers  
file performance bonds with the Director to ensure compliance with the  
Act; and

WHEREAS, the above bound principal is subject to the terms and  
provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if  
the above bound Principal shall fully and faithfully perform the duties  
and in all things comply with the procedures and standards set forth in  
the Act as now or hereafter amended, and the rules and regulations  
promulgated pursuant thereto, including but not limited to the  
correction of any violation of such procedures and standards upon  
discovery, irrespective of whether such discovery is made before  
completion of any well subject to this bond, then this obligation shall  
be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to  
existing laws, rules or regulations, or adoption of new laws, rules or  
regulations shall in any way discharge its obligation on this bond, and  
does hereby waive notice of any such amendment, adoption, or  
modification.

This bond shall be effective from date of issuance or, in the case  
of a water well contractor, date of licensure and shall continue in  
effect until terminated by expiration, mutual agreement or cancellation  
upon 60 days written notice to Principal and Obligor; provided that the  
rights of the Obligor and beneficiaries under this bond which arose  
prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2003

IN WITNESS WHEREOF the Principal and Surety have caused these  
presents to be duly signed and sealed, this 15th day of May,  
2001.

GORE, INC.

Principal, by:

(L.S.)

Approved as to sufficiency  
and accepted:

Environmental Protection  
Division,

Department of Natural  
Resources

EMPLOYERS INSURANCE OF WAUSAU, A MUTUAL COMPANY

Surety, by: Barbara S. MacArthur (S.)

Barbara S. MacArthur, Attorney-in-Fact





# Western Surety Company

## CONTINUATION CERTIFICATE

Western Surety Company hereby continues in force Bond No. 68616636  
briefly described as Water Well Contractor  
for EVERETT ENVIRONMENTAL, INC.  
\_\_\_\_\_, as Principal,  
in the sum of TEN THOUSAND AND NO/100 Dollars, for the term beginning  
July 01, 2002, and ending June 30, 2003, subject to all  
the covenants and conditions of the original bond referred to above.

This continuation is issued upon the express condition that the liability of Western Surety Company under said Bond and this and all continuations thereof shall not be cumulative and shall in no event exceed the total sum above written.

Dated this 07 day of March, 2002.



WESTERN SURETY COMPANY

By Stephen T. Pate  
Stephen T. Pate, Executive Vice President

THIS "Continuation Certificate" MUST BE FILED WITH THE ABOVE BOND.



FROM : LOGAN MARTIN  
Jul 23 02 09:03a

PHONE NO. : 8 236 4015  
Starr-Mathews Rome, GA

Jul. 24 2002 06:15AM P4  
706-291-0579 P.4

Transaction Report & Invoice

**CNA SURETY**

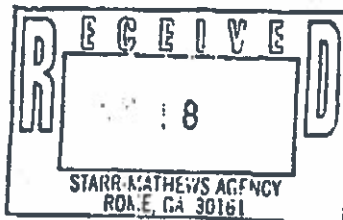
CNA SURETY  
101 SO. PHILLIPS AVENUE  
SIOUX FALLS, S.D. 57192

Principal Information:

ID: 003019252

EVERETT ENVIRONMENTAL, INC.  
P.O. BOX 763  
ARMUCHEE, GA 30105-0763

STARR-MATHEWS AGENCY INC  
P O BOX 1642  
ROME GA 30162-1642



Agency Code: 10-01912

Transaction Description: RENEWAL

Transaction Effective Date: 07/01/2002

Number: 60616636

SF

Written By: WESTERN SURETY COMPANY  
Description: WATER WELL CONTRACTOR

Obligee: DEPT. OF NATURAL RESOURCES  
205 BUTLER ST., STE. 1346  
ATLANTA, GA 30334

Effective Date: 07-01-2002  
Expiration Date: 06-30-2003  
Current Penalty: \$10,000.00  
Renewal Method: CC

PREMIUM	\$200.00	@ 20.000%
Gross Premium Charge:	\$200.00	
Commission Amount:	\$40.00	
Net Premium Due:	\$160.00	

Change Detail:

Agent: You may remove stub below to use as a billing/ credit invoice

CNA Surety

INVOICE

FILE NO.	EFFECTIVE DATE	ANNIVERSARY DATE	PROCESS DATE	PENALTY
0601 68616636	07-01-02	06-30-03	03-07-02	\$10,000.00
PRINCIPAL	EVERETT ENVIRONMENTAL, INC. P.O. BOX 763 ARMUCHEE, GA 30105-0763			
RISK STATE	GA	<del>WESTERN SURETY COMPANY</del>		SF
DESCRIPTION	WATER WELL CONTRACTOR			
OBLIGEE	STATE OF GEORGIA			
AGENCY CODE				
10-01912	CHARGE	\$200.00		

Your agent is:

STARR-MATHEWS AGENCY INC  
P O BOX 1642  
ROME GA 30162-1642





# Western Surety Company

## POWER OF ATTORNEY

### KNOW ALL MEN BY THESE PRESENTS:

That WESTERN SURETY COMPANY, a corporation organized and existing under the laws of the State of South Dakota, and authorized and licensed to do business in the States of Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the United States of America, does hereby make, constitute and appoint

Stephen T. Pate of Sioux Falls,  
State of South Dakota, its regularly elected Executive Vice President,  
as Attorney-in-Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, all of the following classes of documents to-wit:

Indemnity, Surety and Undertakings that may be desired by contract, or may be given in any action or proceeding in any court of law or equity, policies indemnifying employers against loss or damage caused by the misconduct of their employees, official, bail, and surety and fidelity bonds. Indemnity in all cases where indemnity may be lawfully given; and with full power and authority to execute consents and waivers to modify or change or extend any bond or document executed for this Company, and to compromise and settle any and all claims or demands made or existing against said Company.

Western Surety Company further certifies that the following is a true and exact copy of Section 7 of the by-laws of Western Surety Company duly adopted and now in force, to-wit:

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys-in-Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

In Witness Whereof, the said WESTERN SURETY COMPANY has caused these presents to be executed by its Executive Vice President with the corporate seal affixed this 07 day of March, 2002

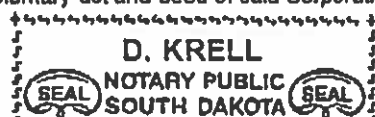
ATTEST

L. Nelson  
Assistant Secretary

WESTERN SURETY COMPANY  
By Stephen T. Pate  
Stephen T. Pate, Executive Vice President

STATE OF SOUTH DAKOTA }  
COUNTY OF MINNEHAHA } ss

On this 07 day of March, 2002, before me, a Notary Public, personally appeared  
Stephen T. Pate and L. Nelson  
who, being by me duly sworn, acknowledged that they signed the above Power of Attorney as Executive Vice President  
and Assistant Secretary, respectively, of the said WESTERN SURETY COMPANY, and acknowledged said instrument to  
be the voluntary act and deed of said Corporation.



My Commission Expires November 30, 2006

D. Krell  
Notary Public





Cells 112

COPY

Bond Number K08315607

**Performance Bond For Water Well Contractors And Drillers**

Name of Water Well Contractor or Driller Michael C. Rice/Cascade Drilling, L.P.

Know All Men By These Present

That we Michael C. Rice/Cascade Drilling, L.P. AND ANY AND ALL EMPLOYEES, OFFICERS AND PARTNERS, as Principal, and Westchester Fire Insurance Company as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Oblige, in the full sum of **TWENTY THOUSAND AND NO/00 DOLLARS (\$20,000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985, p. 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon sixty (60) days written notice to Principal and Oblige; provided that the rights of the oblige and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective 9/20/13 and unless sooner terminated, this bond shall terminate June 30, 2015. In Witness Thereof the Principal and Surety have caused these present to be duly signed and sealed, this 20th day of September 2013.

Michael C. Rice/Cascade Drilling, L.P.

PRINCIPAL, BY \_\_\_\_\_ (L.S.) TITLE: \_\_\_\_\_  
Westchester Fire Insurance Company

SURETY BY: Roxana Palacios  
Roxana Palacios, Attorney-in-Fact

GEORGIA REGISTERED AGENT N/A SEAL:

Revised December 2012



CONTINUATION  
CERTIFICATE

**SAFECO Insurance Company of America**

, Surety upon

a certain Bond No. **4993104**

dated effective **June 30, 1987**  
(MONTH-DAY-YEAR)

on behalf of **Southern Company Services, Inc.**  
(PRINCIPAL)

and in favor of **Georgia - Dept. of Natural Resources**  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on **June 30, 2014**  
(MONTH-DAY-YEAR)

and ending on **June 30, 2015**  
(MONTH-DAY-YEAR)

Amount of bond **\$10,000.00**

Description of bond **Water Well Contractors & Drillers**

Premium: **\$100.00**

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on **April 09, 2014**  
(MONTH-DAY-YEAR)

**SAFECO Insurance Company of America**

By   
**D-Ann Kleidosty, Attorney-In-Fact**



**THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.**

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6125754

First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

**POWER OF ATTORNEY**

KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chaun M. Wilson; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; Tracey D. Watson; William G. Moody

all of the city of Atlanta, state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of May, 2013.



First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: Gregory W. Davenport  
Gregory W. Davenport, Assistant Secretary

STATE OF WASHINGTON  
COUNTY OF KING

SS

On this 15th day of May, 2013, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.



By: KD Riley  
KD Riley, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

**ARTICLE IV – OFFICERS – Section 12. Power of Attorney.** Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation –** The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization –** By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, David M. Carey, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of April, 2014.



By: David M. Carey  
David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CONTINUATION  
CERTIFICATE

Cells 9-10

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia - Dept. of Natural Resources  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2014  
(MONTH-DAY-YEAR)

and ending on June 30, 2015  
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 09, 2014  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By D-Ann Kleidosty  
D-Ann Kleidosty, Attorney-In-Fact



**THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.**

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6125754

First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

**POWER OF ATTORNEY**

KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chaun M. Wilson; D-Ann Keldosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; Tracey D. Watson; William G. Moody

all of the city of Atlanta, state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surely and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of May, 2013.



First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: Gregory W. Davenport  
Gregory W. Davenport, Assistant Secretary

STATE OF WASHINGTON ss  
COUNTY OF KING

On this 15th day of May, 2013, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.



By: KD Riley  
KD Riley, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

**ARTICLE IV - OFFICERS - Section 12. Power of Attorney.** Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surely any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation -** The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surely any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization -** By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, David M. Carey, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of April, 2014.



By: David M. Carey  
David M. Carey, Assistant Secretary

Not valid for mortgage, note, interest rate or resale value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



Southern Company Services, Inc.  
30 Ivan Allen Jr. Boulevard NW  
Atlanta, Georgia 30308



May 2, 2011

Mr. Tony McCook  
Georgia Geologic Survey  
19 Martin Luther King Jr. Dr. SW  
Room 400  
Atlanta, GA 30334

Re: Performance Bond for Water Well Contractors and Drillers  
Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2012.

Please let us know if you need additional information.

Sincerely,

A handwritten signature in cursive script that reads "Clementine Broaders".

Clementine Broaders  
Southern Company Services, Inc.  
Risk Management Department

/cb

Enclosure

cc: Stacy Sprayberry, SCS



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective June 30, 2005  
(MONTH-DAY-YEAR)on behalf of Southern Company Services, Inc.  
(PRINCIPAL)and in favor of State of Georgia - Dept. of Natural Resources  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2011  
(MONTH-DAY-YEAR)and ending on June 30, 2012  
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

Description of bond License Bond - Water Well Contractors &amp; Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 21, 2011  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By

  
Barbara S. MacArthur, Attorney-In-Fact



THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

4178633

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

**SAFECO INSURANCE COMPANY OF AMERICA  
SEATTLE, WASHINGTON  
POWER OF ATTORNEY**

KNOW ALL PERSONS BY THESE PRESENTS: That Safeco Insurance Company of America (the "Company"), a Washington stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint **VIRGINIA B. MCMAHON, GARY D. EKLUND, BARBARA S. MACARTHUR, CHAUN M. WILSON, MICHAEL F. YADACH, ALL OF THE CITY OF ATLANTA, STATE OF GEORGIA**

each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations in the penal sum not exceeding **ONE HUNDRED MILLION AND 00/100 DOLLARS (\$ 100,000,000.00)** each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

**ARTICLE IV- Execution of Contracts: Section 12- Surety Bonds and Undertakings.**

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitations as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the president and attested by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article IV, Section 12 of the By-laws, Garret W. Elliott, Assistant Secretary of Safeco Insurance Company of America, is authorized to appoint such attorneys-in-fact as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

I WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Safeco Insurance Company of America has been affixed thereto in Plymouth Meeting, Pennsylvania this 14th day of October 2010

SAFECO INSURANCE COMPANY OF AMERICA

By Garret W. Elliott  
Garret W. Elliott, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF MONTGOMERY



On this 14th day of October, 2010, before me, a Notary Public, personally came Garret W. Elliott, to me known, and acknowledged that he is an Assistant Secretary of Safeco Insurance Company of America; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Safeco Insurance Company of America thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have personally subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



Notarial Seal  
Teresa Pistella, Notary Public  
Plymouth Twp., Montgomery County  
My Commission Expires Mar. 28, 2012  
Member, Pennsylvania Association of Notaries

By Teresa Pistella  
Teresa Pistella, Notary Public

**CERTIFICATE**

I, the undersigned, Assistant Secretary of Safeco Insurance Company of America, do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article IV, Section 12 of the By-laws of Safeco Insurance Company of America.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Safeco Insurance Company of America at a meeting duly called and held on the 18th day of September, 2009.

VOTED that the facsimile or mechanically reproduced signature of any assistant secretary of the company, wherever appearing upon a certified copy of any power of attorney issued by the company in connection with surety bonds, shall be valid and binding upon the company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 21st day of April, 2011.



By David M. Carey  
David M. Carey, Assistant Secretary

To confirm the validity of this Power of Attorney call  
1-610-822-8240 between 9:00 am and 4:30 pm EST on any business day.

Not valid for mortgage, not  
value guarantees.

Not valid for mortgage, not  
currency rate, interest rate



**MARSH****Barbara S. MacArthur**  
Assistant Vice PresidentMarsh USA Inc.  
3560 Lenox Road, NE, Ste. 2400  
Atlanta, GA 30326  
404 995 2776 FAX: 404 760 5673  
Barbara.MacArthur@marsh.com  
www.marsh.com

April 21, 2011

**RECEIVED**

APR 20 2011

Risk Management  
DepartmentMs. Clementine B. Broaders  
Southern Company Services  
30 Ivan Allen Jr. Blvd. NW  
Bin SC1404  
Atlanta, GA 30308**Subject: Renewal Continuation Certificate**  
**Principal: Southern Company Services, Inc.**  
**Obligee: State of Georgia - Dept. of Natural Resources**  
**Bond Description: License Bond - Water Well Contractors & Drillers**  
**Bond Amount: \$ 10,000.00**  
**Bond Number: 4993104**  
**Indemnity: The Southern Company (Parental)**

Dear C.B.:


I am enclosing your continuation certificate for the above-referenced bond. I ask that you recheck the continuation certificate for accuracy before you file it with the obligee.

We will be sending you our invoice for the renewal premium due for this transaction in the amount of \$100.00. Marsh will receive 27.50 % of this amount from the surety company. Your payment of this invoice constitutes your agreement to our compensation for this bond.

In the event that your organization no longer requires this bond, please return the enclosed documents to Marsh so that we may advise the surety company that this bond is no longer required and obtain a clean flat cancellation on this bond on your behalf.

If you have any questions, please feel free to contact me. Thank you for allowing Marsh to service your surety needs.

Best regards,

  
Barbara S. MacArthur  
Assistant Vice President

Enclosure

/bsm



Marsh &amp; McLennan Companies



# MARSH

Marsh USA Inc.  
Atlanta, GA - 242  
(404) 995-3000

BNA

Invoice No.

382424

Date: 4/21/11

Southern Company Services, Inc  
RM Dept - BIN SC1404  
30 Ivan Allen Jr. Blvd NW  
Atlanta, GA 30308

Effective Date	Expiration Date	Client No.
6/30/11	6/30/12	J21970

Policyholder: Southern Compa

ORIGINAL

Billing Effective Date: 6/30/11

Insurer	Policy No.	Type of Coverage / Item	Amount
SAFECO	4993104	MISC SURETY PREMIUM	100.00
		REMIT IN: UNITED STATES DOLLARS	
	RENEWAL Principal(s): Southern Company Services, Inc. Obligee(s): Georgia - Dept. of Natural Resources Bond Amount: \$10,000.00 Bond Type - Water Well Contractors & Drillers Requester: Clementine B. Broaders Thank you! MacArthur/Atlanta/Surety		
Please indicate Invoice # 382424 on your remittance to:  Marsh USA Inc. P.O. Box 100357 Atlanta, GA 30384-0357			
		TOTAL:	100.00

**Invoice Is Payable In Full Upon Receipt**

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective June 30, 2005  
(MONTH-DAY-YEAR)on behalf of Southern Company Services, Inc.  
(PRINCIPAL)and in favor of State of Georgia - Dept. of Natural Resources  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2011  
(MONTH-DAY-YEAR)and ending on June 30, 2012  
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

Description of bond License Bond - Water Well Contractors &amp; Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 21, 2011  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By Barbara S. MacArthur  
Barbara S. MacArthur, Attorney-In-Fact



THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

4178633

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

**SAFECO INSURANCE COMPANY OF AMERICA  
SEATTLE, WASHINGTON  
POWER OF ATTORNEY**

KNOW ALL PERSONS BY THESE PRESENTS: That Safeco Insurance Company of America (the "Company"), a Washington stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint **VIRGINIA B. MCMANUS, GARY D. EKLUND, BARBARA S. MACARTHUR, CHAUN M. WILSON, MICHAEL F. YADACH, ALL OF THE CITY OF ATLANTA, STATE OF GEORGIA.**

each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations in the penal sum not exceeding **ONE HUNDRED MILLION AND 00/100** DOLLARS (\$ 100,000,000.00) each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

**ARTICLE IV - Execution of Contracts: Section 12. Surety Bonds and Undertakings.**

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitations as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by this president and attested by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article IV, Section 12 of the By-laws, Garnet W. Elliott, Assistant Secretary of Safeco Insurance Company of America, is authorized to appoint such attorneys-in-fact as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Safeco Insurance Company of America has been affixed thereto in Plymouth Meeting, Pennsylvania this 14th day of October 2010.



SAFECO INSURANCE COMPANY OF AMERICA

By Garnet W. Elliott  
Garnet W. Elliott, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA ss  
COUNTY OF MONTGOMERY

On this 14th day of October, 2010, before me, a Notary Public, personally came Garnet W. Elliott, to me known, and acknowledged that he is an Assistant Secretary of Safeco Insurance Company of America; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Safeco Insurance Company of America thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



Notarie: Boss  
Teresa Pastella, Notary Public  
Plymouth Twp., Montgomery County  
My Commission Expires Mar. 29, 2013  
Member, Pennsylvania Association of Notaries

By Teresa Pastella  
Teresa Pastella, Notary Public

**CERTIFICATE**

I, the undersigned, Assistant Secretary of Safeco Insurance Company of America, do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article IV, Section 12 of the By-laws of Safeco Insurance Company of America.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Safeco Insurance Company of America at a meeting duly called and held on the 18th day of September, 2009.

VOTED that the facsimile or mechanically reproduced signature of any assistant secretary of the company, wherever appearing upon a certified copy of any power of attorney issued by the company in connection with surety bonds, shall be valid and binding upon the company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 21st day of April, 2011.



By David M. Carey  
David M. Carey, Assistant Secretary

Not valid for mortgage, note, currency rate, interest rate or other value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



Bond Number KO8418809

**Performance Bond For Water Well Contractors And Drillers**

Name of Water Well Contractor or Driller Michael C. Rice dba Boart Longyear Company

Know All Men By These Present.

That we Michael C. Rice dba Boart Longyear Company and any and all Employees, Officers and Partners, as Principal, and Westchester Fire Insurance Company as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Oblige, in the full sum of **TWENTY THOUSAND AND NO/00 DOLLARS (\$20,000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985.P 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance or, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Oblige; provided that the rights of the obligee and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective July 1, 2010 and unless sooner terminated, this bond shall terminate June 30, 2011. In Witness Whereof the Principal and Surety have caused these present to be duly signed and sealed, this 6th day of, July 2010.  
Michael C. Rice dba Boart Longyear Company

PRINCIPAL, BY [Signature] (L.S.)

TITLE: Franchise Manager  
Westchester Fire Insurance Company

SURETY BY: [Signature]

Cynthia L. Choren, Attorney-In-Fact Non-Resident License No. 747470

GEORGIA REGISTERED AGENT N/A SEAL:



ACKNOWLEDGMENT BY SURETY

STATE  
OF

Missouri

County  
of

St. Charles

} ss.

On this 6th day of July, 2010, before me personally  
appeared Cynthia L. Choren, known to me to be the Attorney-in-Fact of  
Westchester Fire Insurance Company

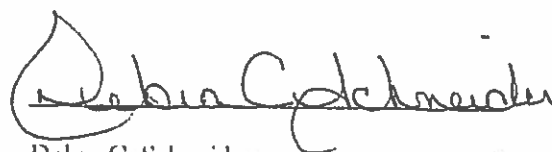
\_\_\_\_\_, the corporation  
that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid  
County, the day and year in this certificate first above written.

My Commission Expires: November 5, 2011

(Seal)

DEBRA C. SCHNEIDER  
Notary Public/Notary Seal  
State of Missouri  
St. Charles County  
COMMISSION #07419088  
My Commission Expires: 11/05/2011

  
Debra C. Schneider  
Notary Public in the State of Missouri  
County of St. Charles



# Power of Attorney

## WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the State of New York, having its principal office in the City of Atlanta, Georgia pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such person's written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

FURTHER RESOLVED, that the Resolution of the Board of Directors of the Company adopted at the meeting held on November 8, 1999 relating to the authorization of certain persons to execute, for and on behalf of the Company, Written Commitments and appointments and delegations, is hereby rescinded.

Does hereby nominate, constitute and appoint Cynthia L. Choren, Debra C. Schneider, Heidi A. Notheisen, JoAnn R. Frank, Karen L. Roeder, Pamela A. Beelman, Sandra L. Ham, all of the City of SAINT LOUIS, Missouri, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Twenty million dollars & zero cents (\$20,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office.

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 1 day of December 2009.

WESTCHESTER FIRE INSURANCE COMPANY



*Stephen M. Haney*  
Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF PHILADELPHIA ss.

On this 1 day of December, A.D. 2009 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
NOTARIAL SEAL  
KAREN E. BRANDT, Notary Public  
City of Philadelphia, Phila. County  
My Commission Expires September 26, 2010

*Karen E. Brandt*  
Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 6th day of July, 2010.



*William L. Kelly*  
William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 01, 2011.



**CLIENT'S COPY**

**SURETY BOND CONTINUATION CERTIFICATE**

TO: State of Georgia  
Division of Environmental Protection  
2 Martin Luther King Jr. Drive SE  
Suite 1252  
Atlanta, GA 30334

To be attached to and form a part of: Performance Bond for Well Contractors and Drillers

Principal on the Bond: Michael C. Rice/Cascade Drilling, L.P.

Surety Bond Number: K08315607

Bond Amount: Twenty Thousand and 00/100 Dollars ( \$20,000.00)

In consideration of the agreed premium charged for this bond, it is understood and agreed that the following change shall be made to this obligation:

**[ x ] CONTINUATION CERTIFICATE**

This certificate extends the life of the bond to June 30, 2017. It is executed upon the express condition that the surety's liability under said bond, together with this and all previous continuation certificates, shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond.

Signed, sealed and dated this 26th day of May , 2015 .

Westchester Fire Insurance Company

By: Katie S

Katie Snider, Attorney-in-Fact

Surety of Record: Westchester Fire Insurance Company  
436 Walnut Street  
Philadelphia, PA 19106  
Phone: (415) 547-4513

Agent of Record: Kibble & Prentice, a USI Company  
601 Union Street, Suite 1000  
Seattle, WA 98101  
Phone: (206) 441-6300



# Power of Attorney

## WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

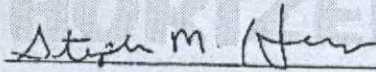
FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

Does hereby nominate, constitute and appoint Heather Allen, Holly E Ulfers, Katie Snider, Nancy N Hill, Roxana Palacios, Steven W Palmer, all of the City of SEATTLE, Washington, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Fifteen million dollars & zero cents (\$15,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 22 day of December 2014.

WESTCHESTER FIRE INSURANCE COMPANY

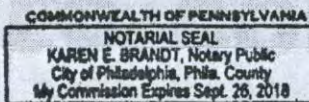


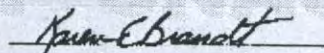
  
Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF PHILADELPHIA ss.

On this 22 day of December, AD. 2014 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.

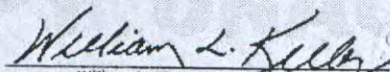


  
Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 26<sup>th</sup> day of May, 2015.



  
William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 22, 2016.





CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia - Dept. of Natural Resources  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2016  
(MONTH-DAY-YEAR)

and ending on June 30, 2017  
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

Description of bond Water Well Contractors & Drillers

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 07, 2016  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By 

D-Ann Kleidosty, Attorney-in-Fact



**THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.**

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7310252

First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

**POWER OF ATTORNEY**

KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; William G. Moody

all of the city of Atlanta, state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 1st day of April, 2016.



First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss  
COUNTY OF MONTGOMERY

On this 1st day of April, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarial Seal  
Teresa Pastella, Notary Public  
Plymouth Twp., Montgomery County  
My Commission Expires March 28, 2017  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

**ARTICLE IV - OFFICERS** - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of April, 2016.



By: Gregory W. Davenport  
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia - Dept. of Natural Resources  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2016  
(MONTH-DAY-YEAR)

and ending on June 30, 2017  
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

Description of bond Water Well Contractors & Drillers

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 07, 2016  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By 

D-Ann Kleidosty, Attorney-in-Fact



**THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.**

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7310252

First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

**POWER OF ATTORNEY**

KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; William G. Moody

all of the city of Atlanta, state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 1st day of April, 2016.



First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss  
COUNTY OF MONTGOMERY

On this 1st day of April, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarial Seal  
Teresa Pastella, Notary Public  
Plymouth Twp., Montgomery County  
My Commission Expires March 28, 2017  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

**ARTICLE IV - OFFICERS** - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of April, 2016.



By: Gregory W. Davenport  
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit,  
currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call  
1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



GENERAL PURPOSE RIDER

To be attached to and form part of Bond Number 09157828 effective June 30, 2015 issued by the Fidelity and Deposit Company of Maryland in the amount of Twenty Thousand and No/100 (\$20,000.00), on behalf of Craig Penton dba Terracon Consultants, Inc. as Principal, and in favor of Director of the Environmental Protection Division, Department of Natural Resources, State of Georgia as Obligee:

NOW Therefore, it is agreed that:

**The expiration date of the bond is hereby amended to:**

**June 30, 2017**

It is further understood and agreed that all other terms and conditions of this bond shall remain unchanged.

This rider is to be effective the 30th day of June , 2015 .

Signed, sealed and dated this 4th day of November , 2015 .

Craig Penton dba Terracon Consultants, Inc.  
Principal

\_\_\_\_\_

Fidelity and Deposit Company of Maryland  
Surety

\_\_\_\_\_

Christy M. Braile, Attorney-in-Fact



6/4/14 sent to  
Craig Penton  
(Stacy Adams)

FOR YOUR RECORDS

Bond Number 09157828

**Performance Bond For Water Well Contractors And Drillers**

Name of Water Well Contractor or Driller Craig Penton dba Terracon Consultants, Inc.

Know All Men By These Present

That we Craig Penton dba Terracon Consultants, Inc. AND ANY AND ALL EMPLOYEES, OFFICERS AND PARTNERS, as Principal, and Fidelity and Deposit Company of Maryland as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Oblige, in the full sum of **TWENTY THOUSAND AND NO/00 DOLLARS (\$20,000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985, p. 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon sixty (60) days written notice to Principal and Oblige; provided that the rights of the oblige and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective June 4, 2014 and unless sooner terminated, this bond shall terminate June 30, 2015. In Witness Whereof the Principal and Surety have caused these present to be duly signed and sealed, this 4th day of, June 20 14.

PRINCIPAL, BY \_\_\_\_\_ (L.S.) TITLE: \_\_\_\_\_

SURETY BY: Christy M. McCart, Attorney-in-Fact

GEORGIA REGISTERED AGENT N/A SEAL: \_\_\_\_\_

Revised December 2012



**COPY**

CONTINUATION  
CERTIFICATE

Atlantic Specialty Insurance Company

, Surety upon

a certain Bond No. **800031223**

dated effective June 30, 2017  
(MONTH-DAY-YEAR)

on behalf of Michael C. Rice and Cascade Drilling, L.P., any and all employees, officers and partners  
(PRINCIPAL)

and in favor of State of Georgia  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2019  
(MONTH-DAY-YEAR)

and ending on June 30, 2021  
(MONTH-DAY-YEAR)

Amount of bond Thirty Thousand and Zero/100 (\$30,000.00)

Description of bond Water Well Contractor Performance Bond

Premium: \$1,200.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on May 9, 2019  
(MONTH-DAY-YEAR)  
Atlantic Specialty Insurance Company

By  
Attorney-in-Fact Elizabeth R. Hahn

Parker, Smith & Feek, Inc.

Agent

2233 112th Ave NE Bellevue, WA 98004

Address of Agent

(425) 709-3600

Telephone Number of Agent



## Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Deanna M. French, Susan B. Larson, Elizabeth R. Hahn, Jana M. Roy, Scott McGilvray, Mindee L. Rankin, Ronald J. Lange, John R. Claeys, Roger Kaltenbach, Guy Armfield, Scott Fisher, Andrew P. Larsen, Nicholas Fredrickson**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **sixty million dollars (\$60,000,000)** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-sixth day of October, 2017.

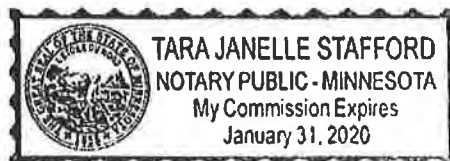
STATE OF MINNESOTA  
HENNEPIN COUNTY



By

Paul J. Brehm, Senior Vice President

On this twenty-sixth day of October, 2017, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 9 day of May, 2019

This Power of Attorney expires  
October 1, 2019



Christopher V. Jerry, Secretary



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2019  
(MONTH-DAY-YEAR)

and ending on June 30, 2020  
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

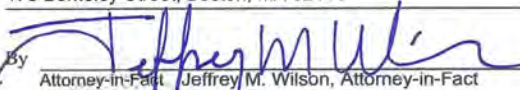
Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 11/10/2020  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America  
175 Berkeley Street, Boston, MA 02116

By   
Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff, Seibels & Williams, Inc.  
Agent

2211 7th Avenue South, Birmingham, AL 35233  
Address of Agent

(205) 252-9871  
Telephone Number of Agent





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No: 8201221-016032

## POWER OF ATTORNEY

**KNOWN ALL PERSONS BY THESE PRESENTS:** That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Anna Childress; Richard H. Mitchell; Sam Audia; Mark W. Edwards, II; Alisa B. Ferris; Robert R. Freel; William M. Smith; Jeffrey M. Wilson

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 8th day of May, 2019.



American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss  
County of MONTGOMERY

On this 8th day of May, 2019, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarist Seal  
Teresa Pastella, Notary Public  
Upper Merion Twp., Montgomery County  
My Commission Expires March 28, 2021  
Montgomery County Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 10th day of November, 2020.



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2020  
(MONTH-DAY-YEAR)

and ending on June 30, 2021  
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 11/10/2020  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America  
175 Berkeley Street, Boston, MA 02116

By

Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff, Seibels & Williams, Inc.  
Agent

2211-7th Avenue South, Birmingham, AL 35233  
Address of Agent

(205) 252-9871  
Telephone Number of Agent





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No: **8201221-016032**

## POWER OF ATTORNEY

**KNOWN ALL PERSONS BY THESE PRESENTS:** That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Anna Childress; Richard H. Mitchell; Sam Audia; Mark W. Edwards, II; Alisa B. Ferris; Robert R. Freely; William M. Smith; Jeffrey M. Wilson

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 8th day of May, 2019.



American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary

State of PENNSYLVANIA  
County of MONTGOMERY ss

On this 8th day of May, 2019 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarial Seal  
Teresa Pastella, Notary Public  
Upper Merion Twp., Montgomery County  
My Commission Expires March 28, 2021  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV – OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 10th day of November, 2020.



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-810-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. 4993104

dated effective 6/30/1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2019  
(MONTH-DAY-YEAR)

and ending on June 30, 2020  
(MONTH-DAY-YEAR)

Amount of bond \$15,000.00

Description of bond Water Well Contractors & Drillers

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on June 05, 2019  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By   
Loretta M. Jones, Attorney-in-fact





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No. **8200528-969358**

## POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Julie Karnes, Andrea Allman, Rachel A. Chaveriat, Jessica Frederick, Rebecca J. Hobbs, Loretta M. Jones, Sandra King, Thelma M. Lett, Michelle Lute-Heatherly, Sandy McElhane, Vicki Nobinger, Bonnie Rice, Mariah Smith, Mary Y. Volmar, Carolyn E. Wheeler, Joy M. Williams

all of the city of Knoxville state of TN each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of February, 2019.



American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss  
County of MONTGOMERY

On this 15th day of February, 2019 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarial Seal  
Teresa Pastella, Notary Public  
Upper Merion Twp., Montgomery County  
My Commission Expires March 28, 2021  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 5th day of June, 2019.



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2021  
(MONTH-DAY-YEAR)

and ending on June 30, 2022  
(MONTH-DAY-YEAR)

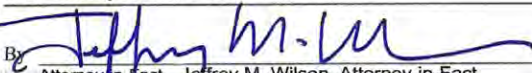
Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/06/2021  
(MONTH-DAY-YEAR)  
SAFECO Insurance Company of America  
175 Berkeley Street, Boston, MA 02116

By   
Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, Inc.  
Agent

2211 7th Avenue South, Birmingham, AL 35233  
Address of Agent

(205) 252-9871  
Telephone Number of Agent





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No: 8205019-016032

## POWER OF ATTORNEY

**KNOWN ALL PERSONS BY THESE PRESENTS:** That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, do hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Frecl; Sam Audia; William M. Smith

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

**IN WITNESS WHEREOF**, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 11th day of March, 2021.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary



State of PENNSYLVANIA  
County of MONTGOMERY

On this 11th day of March, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal  
Teresa Pastella, Notary Public  
Montgomery County  
My commission expires March 28, 2025  
Commission number 1126044  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

**IN TESTIMONY WHEREOF**, I have hereunto set my hand and affixed the seals of said Companies this 6th day of May, 2021.



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2022  
(MONTH-DAY-YEAR)

and ending on June 30, 2023  
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/06/2021  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

175 Berkeley Street, Boston, MA 02116

By

Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, Inc.

Agent

2211 7th Avenue South, Birmingham, AL 35233

Address of Agent

(205) 252-9871

Telephone Number of Agent





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No: 8205019-016032

## POWER OF ATTORNEY

**KNOWN ALL PERSONS BY THESE PRESENTS:** That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, do hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Frecl; Sam Audia; William M. Smith

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

**IN WITNESS WHEREOF**, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 11th day of March, 2021.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By: David M. Carey  
David M. Carey, Assistant Secretary



State of PENNSYLVANIA  
County of MONTGOMERY

On this 11th day of March, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal  
Teresa Pastella, Notary Public  
Montgomery County  
My commission expires March 28, 2025  
Commission number 1126044  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

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**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

**IN TESTIMONY WHEREOF**, I have hereunto set my hand and affixed the seals of said Companies this 6th day of May, 2021.



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2023  
(MONTH-DAY-YEAR)

and ending on June 30, 2024  
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

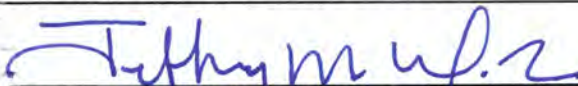
**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/22/2023  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

175 Berkeley Street, Boston, MA 02116

By



Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, LLC

Agent

2211 7th Avenue South, Birmingham, AL 35233

Address of Agent

(205) 252-9871

Telephone Number of Agent





This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

Certificate No 8205019-016032

## POWER OF ATTORNEY

**KNOWN ALL PERSONS BY THESE PRESENTS:** That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Freely; Sam Audia; William M. Smith

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 11th day of March, 2021.



American States Insurance Company  
First National Insurance Company of America  
General Insurance Company of America  
Safeco Insurance Company of America

By:

*David M. Carey*

David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss  
County of MONTGOMERY

On this 11th day of March, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal  
Teresa Pastella, Notary Public  
Montgomery County  
My commission expires March 28, 2025  
Commission number 1126044  
Member, Pennsylvania Association of Notaries

By:

*Teresa Pastella*

Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

### ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**Certificate of Designation** - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 22nd day of May, 2023.



By:

*Renee C. Llewellyn*

Renee C. Llewellyn, Assistant Secretary





SURETY DIVISION  
2211 7TH AVENUE SOUTH, BIRMINGHAM, AL 35233

**MEAGAN CARTER**

## LETTER OF TRANSMITTAL

To: Clementine Broaders  
Southern Power Company

Date: 5/22/2023

We are sending you:

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Duplicate Original | <input type="checkbox"/> Consent of Surety    | <input type="checkbox"/> Certificate of Insurance |
| <input checked="" type="checkbox"/> CC / VC | <input type="checkbox"/> Change Order         | <input type="checkbox"/> Motor Fuel Bonds         |
| <input type="checkbox"/> Invoice            | <input type="checkbox"/> Financial/ Indemnity | <input type="checkbox"/> Bond                     |

No. of Copies: Description:

(1) CC

Bond No. 4993104

**\*\*Please review and notify if you should have any questions, or if changes or amendments are needed. \*\***

These are transmitted as checked below:

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Info and/or necessary action in remarks | <input type="checkbox"/> For your file            | <input checked="" type="checkbox"/> As requested             |
| <input checked="" type="checkbox"/> For your use                 | <input type="checkbox"/> Returned for corrections | <input type="checkbox"/> Please sign as indicated and return |

REMARKS: UPS

If enclosures are not as noted, kindly notify at once.

Signed: **Meagan Carter**, Senior Client Service Specialist – Surety



CONTINUATION  
CERTIFICATE

SAFECO Insurance Company of America

, Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987  
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.  
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2024  
(MONTH-DAY-YEAR)

and ending on June 30, 2025  
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 (\$15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: \$100.00

**PROVIDED:** That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/31/2023  
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America  
175 Berkeley Street, Boston, MA 02116

By   
Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, LLC  
Agent

2211 7th Avenue South, Birmingham, AL 35233  
Address of Agent

(205) 252-9871  
Telephone Number of Agent





**Travelers Casualty and Surety Company of America**  
**Travelers Casualty and Surety Company**  
**St. Paul Fire and Marine Insurance Company**

**POWER OF ATTORNEY**

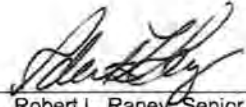
**KNOW ALL MEN BY THESE PRESENTS:** That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Jeffrey M Wilson** of **BIRMINGHAM, Alabama**, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

**IN WITNESS WHEREOF**, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st day of April, 2021**.



State of Connecticut

City of Hartford ss.

By:   
 Robert L. Raney, Senior Vice President

On this the **21st day of April, 2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I hereunto set my hand and official seal.

My Commission expires the **30th day of June, 2026**



  
 Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **31st** day of **May**, **2023**



  
 Kevin E. Hughes, Assistant Secretary

**To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.**  
**Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.**



APPENDIX D

# Boring Logs



2012 GEOTECH ENGINEERING LOGS - ESEE2012DATABASE.GDT - 3/14/13 16:02 - T:\ESEE MAJOR PROJECTS\PROJECTS\MCDONOUGH - ATKINSON\2012\ES2207 ASH POND\CLOSURES AP1-3-4\ASH POND 4 DATA\ASHPOND3AND4\CLOSUREBORINGS.GPJ



# LOG OF TEST BORING

**BORING AP3-08**  
PAGE 1 OF 1  
ES 2207

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

**PROJECT** Ash Pond 3 and 4 Closure Borings  
**LOCATION** Plant McDonough

**DATE STARTED** 2/13/2013 **COMPLETED** 2/13/2013 **SURF. ELEV.** 841.6 **COORDINATES:** N:1,393,839.37 E:2,202,026.83

**CONTRACTOR** Ranger Consulting **EQUIPMENT**  **METHOD** Direct Push

**DRILLED BY** B. Ozment **LOGGED BY** G. Dyer **CHECKED BY**  **ANGLE**  **BEARING**

**BORING DEPTH** 25 ft. **GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED**

**NOTES**

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
						PERCENT RECOVERY (RQD)	
0		Coal Combustion Byproduct (ASH) - gray, moist, loose					poor recovery till natural soil - ash inferred where no recovery.
5							
10							
15							
20			821.6				
25		Silt (ML) - tan, moist, dense	816.6				

Bottom of borehole at 25.0 feet.







2012 GEOTECH ENGINEERING LOGS - ESEE2012DATABASE.GDT - 3/14/13 16:02 - T:\ESEE MAJOR PROJECTS\PROJECTS\MCDONOUGH - ATKINSON\2012\ES2207 ASH POND\CLOSURES AP1-3-4\ASH POND 4 DATA\ASHPOND3AND4\CLOSUREBORINGS.GPJ



# LOG OF TEST BORING

**BORING AP3-10**  
PAGE 1 OF 1  
ES 2207

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

**PROJECT** Ash Pond 3 and 4 Closure Borings  
**LOCATION** Plant McDonough

**DATE STARTED** 2/13/2013 **COMPLETED** 2/13/2013 **SURF. ELEV.** 840.1 **COORDINATES:** N:1,393,806.79 E:2,201,848.05

**CONTRACTOR** Ranger Consulting **EQUIPMENT** **METHOD** Direct Push

**DRILLED BY** B. Ozment **LOGGED BY** G. Dyer **CHECKED BY** **ANGLE** **BEARING**

**BORING DEPTH** 15 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**

**NOTES**

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
					PERCENT RECOVERY (RQD)	
...		Coal Combustion Byproduct (ASH) - gray, moist, loose				poor recovery till natural soil - ash inferred where no recovery.
...						
5						
10						
15						Terminated due to refusal at 15 feet.

Silt (ML)  
- tan, moist, dense

Bottom of borehole at 15.0 feet.

ELEV. 825.2

825.1



2012 GEOTECH ENGINEERING LOGS - ESEE2012DATABASE.GDT - 3/14/13 16:02 - T:\ESEE MAJOR PROJECTS\PROJECTS\MCDONOUGH - ATKINSON\2012\ES2207 ASH POND\CLOSURES AP1-3-4\ASH POND 4 DATA\ASHPOND3AND4\CLOSUREBORINGS.GPJ



# LOG OF TEST BORING

**BORING AP3-11**  
PAGE 1 OF 1  
ES 2207

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

**PROJECT** Ash Pond 3 and 4 Closure Borings  
**LOCATION** Plant McDonough

**DATE STARTED** 2/13/2013 **COMPLETED** 2/13/2013 **SURF. ELEV.** 847.0 **COORDINATES:** N:1,393,906.65 E:2,202,116.07

**CONTRACTOR** Ranger Consulting **EQUIPMENT**  **METHOD** Direct Push

**DRILLED BY** B. Ozment **LOGGED BY** G. Dyer **CHECKED BY**  **ANGLE**  **BEARING**

**BORING DEPTH** 20 ft. **GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED**

**NOTES**

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
						PERCENT RECOVERY (RQD)	
0		<b>Coal Combustion Byproduct (ASH)</b> - gray, moist, loose					poor recovery till natural soil - ash inferred where no recovery.
5							
10							
15							
20		<b>Silt (MH)</b> - tan, moist, dense	836.0				
			827.0				

Bottom of borehole at 20.0 feet.



**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Ash Pond 3 and 4 Closure Borings

**LOCATION** Plant McDonough

**DATE STARTED** 1/30/2013    **COMPLETED** 1/30/2013    **SURF. ELEV.** 839.6    **COORDINATES:** N:1,393,936.85 E:2,202,018.96

**CONTRACTOR** ESEE **EQUIPMENT** Hand **METHOD** 3" manual bucket auger

DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY \_\_\_\_\_ ANGLE \_\_\_\_\_ BEARING \_\_\_\_\_

**BORING DEPTH** 9 ft. **GROUND WATER DEPTH: DURING** \_\_\_\_\_ **COMP.** \_\_\_\_\_ **DELAYED** \_\_\_\_\_

## NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
					PERCENT RECOVERY (RQD)	
		<div style="text-align: right;">ELEV.</div> <b>Coal Combustion Byproduct (ASH)</b> - gray, moist, loose, fly ash  - with layers of bottom ash and brown clayey soil from 1.8 to 4.5 ft				
5						
		<div style="text-align: right;">831.1</div> <b>Silt (ML)</b>				
		<div style="text-align: right;">830.6</div>				

- tan, moist, dense, silty, micaceous residual soil

Bottom of borehole at 9.0 feet.



**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Ash Pond 3 and 4 Closure Borings

**LOCATION** Plant McDonough

**DATE STARTED** 1/30/2013 **COMPLETED** 1/30/2013 **SURF. ELEV.** 841.1 **COORDINATES:** N:1,393,855.54 E:2,202,036.88

**CONTRACTOR** ESEE **EQUIPMENT** Hand **METHOD** 3" manual bucket auger

DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY \_\_\_\_\_ ANGLE \_\_\_\_\_ BEARING \_\_\_\_\_

**BORING DEPTH** 17 ft. **GROUND WATER DEPTH: DURING** \_\_\_\_\_ **COMP.** \_\_\_\_\_ **DELAYED** \_\_\_\_\_

## NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
					PERCENT RECOVERY (RQD)	
		<div>ELEV.</div> <p><b>Coal Combustion Byproduct (ASH)</b> - gray, moist, loose, fly ash</p> <p>- with layers of bottom ash and brown clayey soil from 1.8 to 4.5 ft</p>				
5						
10						
15						
						Terminated at 17 ft due to limits of hand auger equipment.

Bottom of borehole at 17.0 feet.



2012 GEOTECH ENGINEERING LOGS - ESEE2012DATABASE.GDT - 3/14/13 16:02 - T:\ESEE MAJOR PROJECTS\PROJECTS\MCDONOUGH - ATKINSON\2012\ES2207 ASH POND\CLOSURES AP1-3-4\ASH POND 4 DATA\ASHPOND3AND4\CLOSUREBORINGS.GPJ



LOG OF TEST BORING

BORING AP3-H03  
PAGE 1 OF 1  
ES 2207

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond 3 and 4 Closure Borings  
LOCATION Plant McDonough

DATE STARTED 1/30/2013 COMPLETED 1/30/2013 SURF. ELEV. 842.0 COORDINATES: N:1,393,935.87 E:2,201,780.72  
CONTRACTOR ESEE EQUIPMENT Hand METHOD 3" manual bucket auger  
DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY ANGLE BEARING  
BORING DEPTH 5.2 ft. GROUND WATER DEPTH: DURING COMP. DELAYED  
NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
						PERCENT RECOVERY (RQD)	
...		Coal Combustion Byproduct (ASH) - gray, moist, loose, fly ash					
...							
...							
...		- with layers of brown sandy soil from 3.5 to 4.5 ft					
...			837.3				
5		Silt (ML) - tan, moist, dense, silty, micaceous residual soil	836.8				
		Bottom of borehole at 5.2 feet.					



2012 GEOTECH ENGINEERING LOGS - ESEE2012DATABASE.GDT - 3/14/13 16:02 - T:\ESEE MAJOR PROJECTS\PROJECTS\MCDONOUGH - ATKINSON\2012\ES2207 ASH POND\CLOSURES AP1-3-4\ASH POND 4 DATA\ASHPOND3AND4\CLOSUREBORINGS.GPJ



LOG OF TEST BORING

BORING AP3-H04  
PAGE 1 OF 1  
ES 2207

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond 3 and 4 Closure Borings  
LOCATION Plant McDonough

DATE STARTED 1/30/2013 COMPLETED 1/30/2013 SURF. ELEV. 838.0 COORDINATES: N:1,393,573.77 E:2,201,730.16  
CONTRACTOR ESEE EQUIPMENT Hand METHOD 3" manual bucket auger  
DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY ANGLE BEARING  
BORING DEPTH 7.5 ft. GROUND WATER DEPTH: DURING COMP. DELAYED  
NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
					PERCENT RECOVERY (RQD)	
		ELEV.				
		Coal Combustion Byproduct (ASH) - gray, wet, loose, fly ash				
		837.0				
		Silt (MH) - tan, moist, medium dense, low plasticity, residual soil				
		830.5				

Bottom of borehole at 7.5 feet.



**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Ash Pond 3 and 4 Closure Borings

**LOCATION** Plant McDonough

**DATE STARTED** 1/30/2013    **COMPLETED** 1/30/2013    **SURF. ELEV.** 837.8    **COORDINATES:** N:1,393,648.52 E:2,201,744.16

**CONTRACTOR** ESEE **EQUIPMENT** Hand **METHOD** 3" manual bucket auger

DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY \_\_\_\_\_ ANGLE \_\_\_\_\_ BEARING \_\_\_\_\_

BORING DEPTH 11 ft. GROUND WATER DEPTH: DURING \_\_\_\_\_ COMP. \_\_\_\_\_ DELAYED \_\_\_\_\_

## NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
						PERCENT RECOVERY (RQD)	
10		<b>Coal Combustion Byproduct (ASH)</b> - gray, wet, loose, fly ash <b>Silt (MH)</b> - tan, moist, medium dense, low plasticity, residual soil	837.3				
5			826.8				

Bottom of borehole at 11.0 feet.





# LOG OF TEST BORING

**BORING AP3-H06**  
PAGE 1 OF 1  
ES 2207

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Ash Pond 3 and 4 Closure Borings

**LOCATION** Plant McDonough

**DATE STARTED** 1/30/2013 **COMPLETED** 1/30/2013 **SURF. ELEV.** 838.3 **COORDINATES:** N:1,393,605.14 E:2,201,774.43

**CONTRACTOR** ESEE **EQUIPMENT** Hand **METHOD** 3" manual bucket auger

DRILLED BY B. Gallagher LOGGED BY B. Gallagher CHECKED BY \_\_\_\_\_ ANGLE \_\_\_\_\_ BEARING \_\_\_\_\_

**BORING DEPTH** 8.3 ft. **GROUND WATER DEPTH: DURING** \_\_\_\_\_ **COMP.** \_\_\_\_\_ **DELAYED** \_\_\_\_\_

## NOTES

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE)	COMMENTS
						PERCENT RECOVERY (RQD)	
		Coal Combustion Byproduct (ASH) - gray, wet, loose, fly ash					
5							
			830.5				
		Silt (MH)	830.0				

- tan, moist, medium dense, low plasticity, residual soil  
Bottom of borehole at 8.3 feet.



**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Ash Pond 3 and 4 Closure Borings

**LOCATION** Plant McDonough

**DATE STARTED** 3/12/2013      **COMPLETED** 3/12/2013      **SURF. ELEV.** 840.0      **COORDINATES:** N:1,393,882.32 E:2,202,116.04

<b>CONTRACTOR</b>	ESEE	<b>EQUIPMENT</b>	Hand	<b>METHOD</b>	3" manual bucket auger
-------------------	------	------------------	------	---------------	------------------------

**DRILLED BY** B. Gallagher      **LOGGED BY** B. Gallagher      **CHECKED BY**      **ANGLE**      **BEARING**

**BORING DEPTH** 13.5 ft.      **GROUND WATER DEPTH: DURING** 3.5 ft.      **COMP.** 11 ft.      **DELAYED**

## NOTES

[illegible]



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-01

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 12, 2017 10:15  
 DRILLING END: October 12, 2017 00:00  
 COORDINATES: 1390584.300000° -2201400.960000°

SHEET: 1 of 1  
 GS ELEV.: 805.0  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		805.0						
			ASH, (ML), SILT, non plastic, trace fine sand, gray; non-cohesive, moist		ML		DP Run-1		47 48	
5		4.0	ASH, (SM), SILTY SAND, fine, non plastic fines, gray; non-cohesive, moist	801.0	SM		DP Run-2		47 48	
		8.0		797.0						
10			FILL, (SP), SAND, fine, poorly graded, trace gravel, trace low plasticity fines, dark gray mottled dark brown; cohesive, moist		SP		DP Run-3		48 48	
15		16.0	ASH, (SP), SAND, fine, poorly graded, trace gravel, trace non plastic fines, dark gray mottled dark brown; non-cohesive, moist	789.0	SP		DP Run-4		48 48	
		20.0		785.0						
20			ASH, (SP), SAND, fine, poorly graded, trace non plastic fines, gray; non-cohesive, moist		SP		DP Run-5		48 48	
		24.0		781.0						
25			ASH, (ML), SILT, non plastic, trace fine sand, trace gravel, gray; non-cohesive, moist to wet				DP Run-6		48 48	
30					ML		DP Run-7		46 48	
35							DP Run-8		47 48	
		36.0		769.0						
			ASH, (SM), SILTY SAND, medium, non plastic fines, dark black-gray; non-cohesive, wet				DP Run-9		48 48	
40										
					SM		DP Run-10		48 48	
45							DP Run-11		48 48	
		48.0		757.0						
			ASH, (ML), SANDY SILT, non plastic, fine sand, dark gray; non-cohesive, wet		ML		DP Run-12		48 48	
50										
		52.0		753.0						
			ASH, (ML), SILT, non plastic, dark gray; non-cohesive, wet				DP Run-13		47 48	
55					ML		DP Run-14		48 48	
60		58.8		746.2						
			FILL, (CL), SILTY CLAY, medium plasticity, dark brown; cohesive, wet		CL		DP Run-15		48 48	
		61.0		744.0						
		62.0	RESIDUUM, (GP), GRAVEL, coarse, poorly graded, some coarse sand, gray-brown; non-cohesive, moist to wet	743.0	GP		DP Run-16		24 24	
			Bottom of borehole at 62.0 ft.							
65										
70										

20 - 20.75: Trace low plasticity fines and gravel  
 20.75 - 24: Mica-rich soil

32 - 36: Laminated with black stripes  
 33.0 ft

60 - 61: Trace gravel

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: NNY  
 CHECKED: DAH  
 REVIEWED: GLH





# RECORD OF BOREHOLE B-02

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION: Ash Pond 1

DRILLING START: October 12, 2017 00:00  
DRILLING END: October 12, 2017 00:00  
COORDINATES: 1390623.960000° -2201307.160000°

SHEET: 1 of 1  
GS ELEV.: 805.4  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		805.4						
5			ASH, (ML), SILT, non plastic, some fine sand, dark gray; non-cohesive, moist		ML		DP Run-1		48 48	0 - 8: Trace gravel
10							DP Run-2		48 48	
15							DP Run-3		48 48	12 - 13: SANDY SILT with trace gravel
							DP Run-4		48 48	
		17.0		788.4			DP Run-5		48 48	17 - 21.25: Mica-rich soil
20			FILL, (CL), SILTY CLAY, low plasticity, trace fine sand, brown to gray; cohesive, stiff, moist		CL		DP Run-6		48 48	
		21.3		784.2			DP Run-7		48 48	24 - 25: Mica-rich soil
25			ASH, (ML), SILT, non plastic, trace coarse sand, gray; non-cohesive, moist to wet				DP Run-8		48 48	
30					ML		DP Run-9		48 48	
35	Direct Push						DP Run-10		0 48	▽ 33.0 ft
40							DP Run-11		48 48	
45		40.0		765.4			DP Run-12		48 48	
			ASH, (SM), SILTY SAND, coarse, non plastic fines, dark black-gray; non-cohesive, wet		SM		DP Run-13		48 48	
50							DP Run-14		48 48	
55							DP Run-15		48 48	
60		59.0		746.4			DP Run-16		48 48	
			FILL, (CH), CLAY, high plasticity, brown to gray; cohesive, wet		CH				48 48	
65		63.5		741.9						
		64.0		741.4	GP-GC					
			RESIDUUM, (GP-GC), GRAVEL, fine, poorly graded, some non plastic fines, brown; non-cohesive, wet							
70			Bottom of borehole at 64.0 ft.							

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: Geoprobe 7822DT

LOGGED: NNY  
CHECKED: DAH  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE\_LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-03

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 10, 2017 10:00  
 DRILLING END: October 10, 2017 17:00  
 COORDINATES: 1390811.160000° -2201285.050000°

SHEET: 1 of 2  
 GS ELEV.: 810.8  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		810.8							
			ASH, (ML), SILT, non plastic, light gray; non-cohesive, moist				DP Run-1		48 48		1.5 - 2: Trace sand and gravel
5					ML		DP Run-2		48 48		5.8 - 6.8: Some fine sand in soil
10							DP Run-3		48 48	Grout	10.5 - 12.8: Trace sand
		12.8		798.0							
		13.2	FILL, (SP), SAND, fine to coarse, poorly graded, brown-orange; non-cohesive, moist	797.6	SP		DP Run-4		48 48		
15		15.0	ASH, (ML), SILT, non plastic, light gray; non-cohesive, moist	795.8	ML						
		16.0	ASH, (SP), SAND, medium to coarse, poorly graded, trace gravel, trace non plastic fines, gray to brown; non-cohesive, moist	794.8	SP						
		17.0		793.8	ML						
		18.0	ASH, (ML), SILT, non plastic, light gray; non-cohesive, moist	792.8	SP		DP Run-5		48 48		
20	Direct Push		ASH, (SP), SAND, fine to coarse, poorly graded, dark gray to brown; non-cohesive, moist								
			FILL, (CL), SANDY SILTY CLAY, low plasticity, fine sand, trace gravel, brown-red; cohesive, moist		CL		DP Run-6		48 48	Bentonite	
25		25.5		785.3							
			ASH, (SP), SAND, medium, poorly graded, dark gray; non-cohesive, moist		SP		DP Run-7		48 48		26.5 - 27: Some silt in soil
		28.0		782.8							28 - 28.1: Trace low plastic fines
30			ASH, (ML), SANDY SILT, non plastic, coarse sand, brown to gray; non-cohesive, moist to wet				DP Run-8		48 48		
					ML						
35							DP Run-9		48 48		
		37.0		773.8							
		38.0	ASH, (SP), SAND, coarse, poorly graded, black; non-cohesive, moist	772.8	SP		DP Run-10		48 48		
40			ASH, (ML), SILT, non plastic, trace fine sand, dark black-gray; non-cohesive, moist to wet		ML						
Log continued on next page											

▽ 39.9 ft

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE\_LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-03

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 10, 2017 10:00  
 DRILLING END: October 10, 2017 17:00  
 COORDINATES: 1390811.160000° -2201285.050000°

SHEET: 2 of 2  
 GS ELEV.: 810.8  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		770.8						
		42.0	ASH, (ML), SILT, non plastic, trace fine sand, dark black-gray; non-cohesive, moist to wet ( <i>continued</i> )	768.8	ML		DP Run-11	48 48		
			ASH, (ML), SILT, non plastic, trace fine sand, dark gray to light gray; non-cohesive, wet				DP Run-12	18 48		
45							DP Run-13	48 48		
					ML		DP Run-14	48 48		
50							DP Run-15	12 48		
		56.0	ASH, (SP), SAND, fine to coarse, poorly graded, trace gravel, dark black-gray; non-cohesive, wet	754.8	SP		DP Run-16	48 48		
							DP Run-17	18 48		
60							DP Run-18	18 48		
		63.5	RESIDUUM, (SP-SM), SAND, fine, poorly graded, some non plastic fines, dark gray to yellow-brown; non-cohesive, moist to wet	747.3	SP-SM					
65										
		68.0	RESIDUUM, (ML), SILT, non plastic, trace fine sand, gray to yellow-brown; non-cohesive, moist	742.8	ML					
70										
		72.0	Bottom of borehole at 72.0 ft.	738.8						
75										
80										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-04

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 11, 2017 08:30  
 DRILLING END: October 11, 2017 11:45  
 COORDINATES: 1390826.070000° -2201063.470000°

SHEET: 1 of 1  
 GS ELEV.: 805.0  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		805.0						
			ASH, (CL), SILTY CLAY, medium plasticity, trace fine gravel, light gray to brown; cohesive, moist		CL		DP Run-1		48 48	
5		4.0		801.0			DP Run-2		48	
			ASH, (ML), SILT, non plastic, some fine gravel, dark gray; non-cohesive, moist		ML		DP Run-3		48 48	
10							DP Run-4		48 48	
		13.0		792.0			DP Run-5		48 48	
15			FILL, (ML), SILT WITH SLIGHT PLASTICITY, low plasticity, trace fine sand, trace fine gravel, brown to red; cohesive, moist		ML		DP Run-6		48 48	
		19.0		786.0			DP Run-7		48 48	
20			ASH, (ML), SILT, non plastic, gray; non-cohesive, moist		ML		DP Run-8		48 48	
							DP Run-9		48 48	
25							DP Run-10		48 48	
		29.0		776.0			DP Run-11		48 48	
30			ASH, (CL), SILTY CLAY, medium plasticity, some fine sand, some fine gravel, gray, cohesive, wet		CL		DP Run-12		48 48	
		31.0		774.0			DP Run-13		48 48	
			ASH, (SP), SAND, coarse, poorly graded, trace non plastic fines, dark gray to black; non-cohesive, wet		SP		DP Run-14		31 48	
35							DP Run-15		48 48	
		38.0		767.0			DP Run-16		48 48	
40			FILL, (CL), SANDY SILTY CLAY, non plastic, coarse sand, trace coarse gravel, gray; non-cohesive, moist to wet		CL		DP Run-17		48 48	
		40.0		765.0			DP Run-18		48 48	
			ASH, (SM), SILTY SAND, coarse, non plastic fines, some coarse gravel, dark gray to black; non-cohesive, wet		SM		DP Run-19		48 48	
45							DP Run-20		48 48	
		52.0		753.0			DP Run-21		48 48	
50			ASH, (ML), SILT, non plastic, some fine sand, trace fine gravel, dark gray to black; non-cohesive, wet		ML		DP Run-22		48 48	
		54.5		750.5			DP Run-23		48 48	
55			RESIDUUM, (CL), SILTY CLAY, medium plasticity, trace fine sand, brown to light gray; cohesive, moist		CL		DP Run-24		48 48	
		55.8		749.2			DP Run-25		48 48	
			RESIDUUM, (SC), CLAYEY SAND, coarse, non plastic fines, light brown; non-cohesive, moist to wet		SC		DP Run-26		48 48	
60		60.0		745.0						
			Bottom of borehole at 60.0 ft.							
65										
70										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: NNY  
 CHECKED: DAH  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-06

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 17, 2017 14:00  
 DRILLING END: October 17, 2017 15:30  
 COORDINATES: 1391311.570000° -2201201.060000°

SHEET: 1 of 1  
 GS ELEV.: 810.0  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		810.0						
			ASH, (ML), SILT, non plastic, trace fine sand, dark gray; non-cohesive, moist				DP Run-1		48 48	
5					ML		DP Run-2		48 48	
10							DP Run-3		48 48	
15							DP Run-4		48 48	
		16.8		793.2						
		18.2	ASH, (ML), SANDY SILT, non plastic, fine sand, red to dark brown; non-cohesive, moist	791.8	ML		DP Run-5		48 48	
20			FILL, (SP), SAND, fine, poorly graded, some gravel, trace non plastic fines, brown-red; non-cohesive, moist		SP		DP Run-6		48 48	
		22.0		788.0			DP Run-7		48 48	
25			ASH, (ML), SILT, non plastic, trace fine sand, dark gray; non-cohesive, moist				DP Run-8		48 48	
30					ML		DP Run-9		48 48	
35							DP Run-10		48 48	
		36.0		774.0						
40			ASH, (ML), SILT, non plastic, trace fine to coarse sand, dark gray; non-cohesive, wet		ML		DP Run-11		48 48	
45							DP Run-12		6 48	
		44.0		766.0						
50			RESIDUUM, (SM), SILTY SAND, fine, non plastic fines, brown-red; non-cohesive, moist		SM		DP Run-13		24 48	
		52.0		758.0						
			Bottom of borehole at 52.0 ft.							
55										
60										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-07

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 16, 2017 13:00  
 DRILLING END: October 16, 2017 14:15  
 COORDINATES: 1391262.670000° -2200971.120000°

SHEET: 1 of 1  
 GS ELEV.: 805.1  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		805.1						
5			ASH, (ML), SILT, non plastic, trace fine sand, trace gravel, dark black-gray; non-cohesive, moist		ML		DP Run-1	46 48		
10							DP Run-2	48 48		
12.0				793.1			DP Run-3	48 48		
14.0			ASH, (ML), SILT, non plastic, some fine sand, dark gray; non-cohesive, moist	791.1	ML		DP Run-4	48 48		
15			FILL, (CL), SILTY CLAY, low plasticity, some fine sand, trace gravel, brown-red; cohesive, moist		CL		DP Run-5	48 48		
18.5				786.6			DP Run-6	48 48		
20			ASH, (ML), SILT, non plastic, some fine sand, dark gray; non-cohesive, moist to wet				DP Run-7	48 48		
25							DP Run-8	44 48		
30							DP Run-9	48 48		
35					ML		DP Run-10	48 48		
40							DP Run-11	48 48		
45							DP Run-12	48 48		
50							DP Run-13	48 48		
52.0				753.1			DP Run-14	24 48		
55			ASH, (ML), SANDY SILT, non plastic, fine sand, light gray to brown-red; non-cohesive, moist		ML		DP Run-15	14 48		
60		60.0	Bottom of borehole at 60.0 ft.	745.1						
65										
70										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





# RECORD OF BOREHOLE B-08

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION: Ash Pond 1

DRILLING START: October 13, 2017 08:10  
DRILLING END: October 13, 2017 00:00  
COORDINATES: 1391488.660000° -2201366.250000°

SHEET: 1 of 1  
GS ELEV.: 804.9  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		804.9						
5			ASH, (ML), SILT, non plastic, gray; non-cohesive, moist		ML		DP Run-1	34 48		
10							DP Run-2	48 48		
15							DP Run-3	48 48		
15		13.0	FILL, (SM), SILTY SAND, fine, non plastic fines, some gravel, light brown to gray; non-cohesive, moist	791.9	SM		DP Run-4	48 48		
20		18.0	ASH, (ML), SILT, non plastic, dark black-gray; non-cohesive, moist to wet	786.9			DP Run-5	48 48		
25					ML		DP Run-6	48 48		
30							DP Run-7	48 48		
35							DP Run-8	48 48		
35		32.0		772.9						
35		33.0	ASH, (GP), SANDY GRAVEL, poorly graded, coarse sand, dark black-gray; non-cohesive, wet	771.9	GP		DP Run-9	48 48		
40		36.0	RESIDUUM, (SC), CLAYEY SAND, non plastic fines, some coarse gravel, brown mottled white; non-cohesive, moist Bottom of borehole at 33.0 ft.	768.9	SC					

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: Geoprobe 7822DT

LOGGED: NNY  
CHECKED: DAH  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-09

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 17, 2017 10:00  
 DRILLING END: October 17, 2017 12:00  
 COORDINATES: 1391487.130000° -2201152.400000°

SHEET: 1 of 1  
 GS ELEV.: 804.7  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		804.7							
5			ASH, (ML), SILT, non plastic, dark gray; non-cohesive, moist		ML		DP Run-1		48 48		
10							DP Run-2		48 48	6 - 8: Some gravel and sand	
15		11.0		793.7			DP Run-3		48 48	12 - 16: Trace gravel and sand	
20			ASH, (ML), SILT, non plastic, some fine sand, dark gray; non-cohesive, stiff, moist		ML		DP Run-4		48 48		
25							DP Run-5		48 48	18 - 20: Some gravel and sand	
30							DP Run-6		48 48		
35							DP Run-7		48 48		
40		28.0		776.7			DP Run-8		48 48		
			ASH, (ML), SILT, non plastic, some fine sand, dark gray; non-cohesive, wet		ML		DP Run-9		48 48		
		36.0		768.7			DP Run-10		12 48	▽ 38.0 ft	
			RESIDUUM, (SM), SILTY SAND, fine, non plastic fines, brown-red, laminated; non-cohesive, moist, Mica flakes		SM		DP Run-11		40 48		
45		44.0		760.7							
			Bottom of borehole at 44.0 ft.								
50											
55											
60											

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-10

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION: Ash Pond 1

DRILLING START: October 17, 2017 00:00  
 DRILLING END: October 17, 2017 00:00  
 COORDINATES: 1391445.960000° -2200913.410000°

SHEET: 1 of 1  
 GS ELEV.: 804.5  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		804.5						
5			ASH, (ML), SILT, non plastic, dark gray to brown-red; non-cohesive, moist		ML		DP Run-1		48 48	
10							DP Run-2		48 48	
15							DP Run-3		48 48	
20							DP Run-4		48 48	
25		16.0		788.5	ML		DP Run-5		48 48	
30			ASH, (ML), SILT, non plastic, some fine sand, dark gray to brown-red; non-cohesive, moist to wet				DP Run-6		48 48	
35		24.0		780.5			DP Run-7		48 48	
40		28.0	ASH, (ML), SILT, non plastic, dark gray; non-cohesive, wet	776.5	ML		DP Run-8		48 48	
45		32.0	ASH, (SM), SILTY SAND, fine, non plastic fines, dark gray; non-cohesive, wet	772.5	SM		DP Run-9		48 48	
50			ASH, (ML), SILT, non plastic, trace fine to medium sand, dark gray; non-cohesive, wet		ML		DP Run-10		48 48	
55							DP Run-11		48 48	
60							DP Run-12		48 48	
		47.0	(SP-SM), SAND, fine, poorly graded, some non plastic fines, light gray with brown-red; non-cohesive, moist	757.5			DP Run-13		24 48	
		52.0		752.5	SP-SM					
			Bottom of borehole at 52.0 ft.							

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: Geoprobe 7822DT

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-11

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION:

DRILLING START: September 14, 2017 00:00  
 DRILLING END: September 14, 2017 00:00  
 COORDINATES: 1390316.780000° -2201291.170000°

SHEET: 1 of 2  
 GS ELEV.: 754.1  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT	
0		0.0		754.1						
5	Hand Auger	5.0	FILL, (ML), CLAYEY SILT AND SAND, low plasticity, and fine SAND, reddish-brown; micaceous, cohesive, firm, w < PL	749.1	ML		GB HS-01		12 12	
10			FILL, (ML), SANDY CLAYEY SILT, low plasticity, fine sand, gray and brown; cohesive, soft to stiff, w ~ PL to w > PL		ML		GB HS-02		12 12	
12.0		12.0		742.1			DO GB HS-03		6 6	
15	Wash Rotary		(GC), SANDY CLAYEY GRAVEL, fine to coarse, fine to medium sand, low plasticity fines, gray; non-cohesive, loose, wet		GC		DO GB HS-04	WOH-1-3-2 (4)	6 6	
20							DS UD-01		23 24	
25		23.5	RESIDUUM, (ML), CLAYEY SILT AND SAND, low plasticity, and fine SAND, trace fine gravel, red-brown; micaceous, cohesive, firm to stiff, w ~ PL to w > PL	730.6			DO S-02	6-2-4-6 (6)	4 24	
30							DO S-03	6-4-4-3 (8)	4 24	
35							DO S-04	8-11-11-13 (22)	17 24	
40		38.5	PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), GRAVELLY SILTY SAND, low plasticity fines, tan; micaceous, non-cohesive, very dense, moist	715.6	SM		DO S-05	8-8-9-14 (17)	14 24	
45		41.0	SAND, low plasticity fines, tan; micaceous, non-cohesive, very dense, moist	713.1			DO S-06	5-6-10-11 (16)	24 24	
50			End of soil drilling at 41 ft Continued as cored hole. See Record of Drillhole.				DO S-07	25-50/5" (50/5")	11 11	
55										
60										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: CME 550

LOGGED: JGM  
 CHECKED: JBH  
 REVIEWED: GLH





SHEET: 2 of 2  
GS ELEV.: 754.1  
TOC ELEV.: na  
DATUM: NAD 83

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: September 14, 2017 00:00  
DRILLING END: September 14, 2017 00:00  
COORDINATES: 1390316.780000° -2201291.170000°

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: CME 550

LOGGED: JGM  
CHECKED: JBH  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-12

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION:

DRILLING START: September 7, 2017 00:00  
 DRILLING END: September 9, 2017 00:00  
 COORDINATES: 1390555.370000° -2200869.620000°

SHEET: 1 of 2  
 GS ELEV.: 763.3  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		763.3						
5	Hand Auger		(ML), SANDY SILT WITH SLIGHT PLASTICITY, fine to coarse sand, red-brown; micaceous, non-cohesive, compact, moist		ML		CB S1		12 12	
6.0		6.0		757.3			CB S2		12 12	
10			(ML), SANDY SILT WITH SLIGHT PLASTICITY, fine sand, gray; micaceous, non-cohesive, compact, dry				DO S3	14-5-6-9 (11)	15 24	
15							DO S4	7-6-8-8 (14)	0 24	
20	Wash Rotary				ML		DO S5	5-7-11-14 (18)	23 24	
25							DO S6	10-15-15-11 (30)	1 24	
30							DO S7	3-5-8-19 (13)	20 24	
32.1		32.1		731.2			DO S8	8-15-20-43 (35)	21 24	
35			End of soil drilling at 32.1 ft Continued as cored hole. See Record of Drillhole.							
40										
45	HQ Rock Core									
50										
55										
60										

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG: CME 550

LOGGED: JBH  
 CHECKED: JBH  
 REVIEWED: GLH





# RECORD OF DRILLHOLE B-12

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: September 7, 2017 00:00  
DRILLING END: September 9, 2017 00:00  
COORDINATES: 1390555.370000° -2200869.620000°

SHEET: 2 of 2  
GS ELEV.: 763.3  
TOC ELEV.: na  
DATUM: NAD 83

02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012\_01\_22B E-M.GPJ - 11/22/17 07:24  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

DEPTH (ft)	SOIL/ROCK PROFILE			BORING METHOD	TEST METHODS										ISRM Strength Index						ADVANCEMENT RATE ft/min																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Depth	DESCRIPTION	Elev		GRAPHIC LOG	JN-Joint FLT-Fault SHR-Shear B-Bedding FO-Foliation	PL-Planar CU-Curved UN-Undulating ST-Stepped IR-Irregular	PO-Polished SK-Slickensided SM-Smooth RO-Rough VR-Rough	CA-Calcite CL-Clay CON-Contact Fe-Iron MI-Mica	Py-Pyrite M-Silt MN-Manganese CR-Carbon SH-Shale	CO-Coal CN-Clean SOL-Solutioning W-Weathered Mech-Poss. Mechanical	J <sub>n</sub>	J <sub>r</sub>	J <sub>a</sub>	J <sub>cr</sub>	FRAC PER FT	ISRM Strength Index																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: CME 550

LOGGED: JBH  
CHECKED: JBH  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE B-13

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: September 13, 2017 00:00  
DRILLING END: September 13, 2017 00:00  
COORDINATES: 1392457.140000° -2201463.290000°

SHEET: 1 of 2  
GS ELEV.: 819.5  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		819.5							
5			Hydrovac								
10		10.0		809.5							
15	Wash Rotary		(ML), SANDY SILT WITH SLIGHT PLASTICITY, fine to coarse sand, light brown; micaceous, non-cohesive, dense, moist		ML		DO S1	5-7-9-11 (16)	24 24		
							DO S2	14-20-26-41 (46)	18 24		
17.0		17.0		802.5							
20			End of soil drilling at 17 ft Continued as cored hole. See Record of Drillhole.								
25											
30											
35											
40											
45											
50											
55											
60											

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: CME 550

LOGGED: JBH  
CHECKED: JBH  
REVIEWED: GLH





02 - GOLDER - DRILLHOLE RECORD - TEST V7 2012\_01\_22B E-M.GPJ - 11/22/17 07:24  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF DRILLHOLE B-13

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: September 13, 2017 00:00  
DRILLING END: September 13, 2017 00:00  
COORDINATES: 1392457.140000° -2201463.290000°

SHEET: 2 of 2  
GS ELEV.: 819.5  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	SOIL/ROCK PROFILE			BORING METHOD	Geological & Mechanical Data										ISRM Strength Index						ADVANCEMENT RATE ft/min																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Depth	DESCRIPTION	Elev		GRAPHIC LOG	JN-Joint FLT-Fault SHR-Shear B-Bedding FO-Foliation	PL-Planar CU-Curved UN-Undulating ST-Stepped IR-Irregular	PO-Polished SK-Slickensided SM-Smooth RO-Rough VR-Rough	CA-Calcite CL-Clay CON-Contact Fe-Iron MI-Mica	Py-Pyrite M-Silt MN-Manganese CR-Carbon SH-Shale	CO-Coal CN-Clean SOL-Solutioning W-Weathered Mech-Poss. Mechanical	J <sub>n</sub>	J <sub>r</sub>	J <sub>a</sub>	J <sub>cr</sub>	FRAC PER FT	ISRM Strength Index																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG: CME 550

LOGGED: JBH  
CHECKED: JBH  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE VWP-01

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: October 25, 2017 12:15  
DRILLING END: October 25, 2017 17:00  
COORDINATES: 1391743.430000° -2200846.600000°

SHEET: 1 of 1  
GS ELEV.: 780.0  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		780.0							
5			ASH, (ML), SILT, non plastic, some fine sand, dark gray, non-cohesive, moist to wet				DP Run-1		30 48	Concrete	0 - 1: Wet
10					ML		DP Run-2		14 48		4 - 8: Moist
15							DP Run-3		7 48		8 - 12: Wet
20							DP Run-4		12 48	← VWP Grout	
20		20.0		760.0			DP Run-5		48 48		16 - 20: Contains possible collapsed ash
20			No Recovery				DP Run-6		0 24		
20		22.0		758.0						← VWP	
25		23.2		756.8							
25			Bottom of borehole at 22.0 ft.								
30											
35											
40											
45											
50											
55											
60											

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG:

LOGGED: DAH  
CHECKED: NNY  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
\\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE VWP-02

PROJECT: Plant McDonough Adv. Engineering Evaluation  
PROJECT NO.: 1661841  
LOCATION:

DRILLING START: October 26, 2017 08:15  
DRILLING END: October 26, 2017 14:45  
COORDINATES: 1391707.150000° -2200912.790000°

SHEET: 1 of 1  
GS ELEV.: 780.8  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		780.8							
			ASH, (ML/ML), SILT, non plastic, dark gray; non-cohesive, moist		ML/ML		DP Run-1		30 48	Concrete	0 - 1.5: Wet
5		4.0	ASH, (SM), SILTY SAND, fine, non plastic fines, dark gray; non-cohesive, moist, Becoming wet at 7.5 ft	776.8	SM		DP Run-2		28 48		4 - 8: 2 inch lamination of Sandy Silt
10		11.0		769.8			DP Run-3		46 48	Grout  VWP	12 - 16: 2 inch diameter lamination of mica-rich Silty Sand, Coarse
		12.0	ASH, (ML), SILT WITH SLIGHT PLASTICITY, medium plasticity, trace sand; cohesive, firm, moist	768.8	ML		DP Run-4		42 48		
15		16.0	(ML), SILT WITH SLIGHT PLASTICITY, some fine sand, light brown; cohesive, moist	764.8	ML		DP Run-5		14 48		
20		20.0	(SP-SM), SAND, fine, poorly graded, some medium plasticity fines, light brown; cohesive, moist		SP-SM		DP Run-6		24 48		20 - 24: Mica-rich with trace of white inclusions
		24.0	(SM), SILTY SAND, non plastic fines, brown-yellow, laminated; non-cohesive, firm, moist	760.8	SM					VWP	
25			Bottom of borehole at 24.0 ft.	756.8							
30											
35											
40											
45											
50											
55											
60											

DRILLING CO.: SCS  
DRILLER: S. Milam  
DRILL RIG:

LOGGED: DAH  
CHECKED: NNY  
REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE VWP-03

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION:

DRILLING START: October 30, 2017 07:50  
 DRILLING END: October 30, 2017 08:50  
 COORDINATES: 1391821.770000° -2200961.490000°

SHEET: 1 of 1  
 GS ELEV.: 789.5  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		789.5							
5		5.5	(ML), SANDY SILT, non plastic, fine sand, light brown; non-cohesive, moist	784.0	ML		DO S1	5-6-8-8 (14)	20 24	Concrete	8.5 - 10.5: Occasional bending
10			(SM), SILTY SAND, fine, light brown; non-cohesive, moist		SM		DO S2	9-18-24-30 (42)	20 24		
15		15.5		774.0			DO S3	20-50/4" (50/4")	11 10		
20		20.5	(SP), SAND, poorly graded, trace gravel, trace non plastic fines, light brown; non-cohesive, moist	769.0	SP		DO S4	50-48/0" (50/0")	1 1		
25		23.8 24.3	(ML), SANDY SILT, non plastic, fine sand, light brown; non-cohesive, moist (SP), SAND, medium, poorly graded, some gravel, gray; non-cohesive, moist Bottom of borehole at 24.3 ft.	765.7 765.2	ML SP		DO S5	15-50/3" (50/3")	9 9	Grout  ←VWP	
30											
35											
40											
45											
50											
55											
60											

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG:

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE VWP-04

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION:

DRILLING START: October 30, 2017 14:00  
 DRILLING END: October 30, 2017 14:40  
 COORDINATES: 1391743.460000° -2200981.740000°

SHEET: 1 of 1  
 GS ELEV.: 786.7  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		786.7							
5			(ML), SILT, non plastic, some fine sand, brown-red; non-cohesive, moist		ML		DO S1	6-36-50 (86)	22 24		
10		10.5		776.2			DO S3	5-4-3-7 (7)	22 24		
15		15.5	(ML), SILT, non plastic, trace fine sand, trace gravel, brown-red to gray; non-cohesive, wet	771.2	ML		DO S4	4-4-4-5 (8)	21 24		
20		20.5	(SP), SAND, fine, poorly graded, trace non plastic fines, gray mottled orange, laminated; non-cohesive, moist	766.2	SP		DO S5	11-12-12-15 (24)	12 24		
25			SPT replaced (found to be replaced) Bottom of borehole at 22.3 ft.								
30											
35											
40											
45											
50											
55											
60											

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG:

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 11/17/17 16:04  
 \\ATLANTA\DATA\CLIENTS\SOUTHERN COMPANY\1661841 ADV ENG TECH EVALS MCDONOUGH\300 - FIELD INFORMATION\GINT FILES\20171117 - BOREHOLE LOGS - OAE.GPJ

# RECORD OF BOREHOLE VWP-05

PROJECT: Plant McDonough Adv. Engineering Evaluation  
 PROJECT NO.: 1661841  
 LOCATION:

DRILLING START: October 31, 2017 09:25  
 DRILLING END: October 31, 2017 10:25  
 COORDINATES: 1391738.730000° -2201039.730000°

SHEET: 1 of 1  
 GS ELEV.: 785.9  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			WELL DIAGRAM	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic			
0		0.0		785.9							
5		5.5	(SP), SAND, fine, poorly graded, light gray mottled brown; non-cohesive, moist	780.4	SP		DO S1	6-20-38-49 (58)	24 24	 Concrete  Grout  VWP	16: Rock caught in teeth of bit, rig starting to choke, unstable to advance
10		10.5	(SP), SAND, fine, poorly graded, some gravel, light gray; non-cohesive, moist	775.4	SP		DO S2	32-50	0 24		
15		15.5	(SP), SAND, fine, poorly graded, trace gravel, trace non plastic fines, light gray; non-cohesive, moist	770.4	SP		DO S3	15-50	0 24		
20		Bottom of borehole at 16.4 ft.									
25											
30											
35											
40											
45											
50											
55											
60											

16: Rock caught in teeth of bit, rig starting to choke, unstable to advance

DRILLING CO.: SCS  
 DRILLER: S. Milam  
 DRILL RIG:

LOGGED: DAH  
 CHECKED: NNY  
 REVIEWED: GLH







# BORING LOG

**BORING B-02**

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/2/2012 COMPLETED 10/2/2012 GROUND ELEVATION 848.3 ft COORDINATES N 1393958 E 2202119.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY R. Tinsley CHECKED BY BORING DEPTH 54.4 ft.

GROUND WATER DEPTH: DURING 42 ft. COMP. DELAYED 27.8 ft. after 24 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b> - Gravel surface with some vegetation.  - brown, medium stiff, SILT with mica and quartz fragments.  - CL-ML: dark red, stiff, SILT/CLAY; micaceous		SS -1	4.5	4-6-9 (15)		2.5YR.
10		- reddish brown, dry, medium stiff, SILT with mica and relict bedding.		SS -2	9.5	4-4-4 (8)		saprolite (gneiss).
15		- medium stiff, SAA with mica, quartz and feldspar; distinct banding		SS -3	14.5	2-3-3 (6)		saprolite.
20		- light yellowish brown, medium stiff, fine to coarse grain, SILT with mica, quartz, and feldspar		SS -4	19.5	1-3-2 (5)		saprolite; distinct color change from red to tan with micas.
25				SS	24.5	2-3-5		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:43 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG



**BORING B-02**

Page 2 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - damp, medium stiff, SAA		-5		(8)		upper saprolite.
30		  - gray and white, dry, very hard, SILT; gneiss saprolite		SS -6	29.5	6-15-25 (40)		lower saprolite.
35		- olive brown, very hard, SAA, more evidence of water (iron) staining; some black specks (manganese?)		SS -7	34.5	9-27-40 (67)		2.5Y.
40		- pale brown, dry, very hard, pulverized SILT with gneiss fragments		SS -8	39.5	50 (0)		10YR.
45		  <b>Gneiss</b> - dark gray, hard, slightly weathered, augen gneiss with iron staining along partings. - extremely weathered and broken gneiss	804.2	RC -1	44.1			H2O on augers when pulled.
50		- gray, hard, slightly weathered, staining along vertical fractures  - dark gray, weathered augen gneiss and mica schist with chlorite. Quartz layers at 50 ft, 52.8 ft and 54.1 ft.; Deformed and folded about 3 inches.  - Schist: hard, slightly weathered, with chlorite		RC -2	49.4			

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:43 - \\VALTRCFP01\1\APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-02**  
Page 3 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		Bottom of borehole at 54.4 feet.	793.9					
60								
65								
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:43 - \\VALTRCFP01\IAPARKER\$\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME			
Hydrogeologic Investigation		DRILLER: S. Denty					
LOCATION: Ash Pond		RIG TYPE: CME550		DGWA-2/B-2 DGWC-2			
LOGGER: Rhonda Tinsley		DRILLING METHODS: HS Auger/HQ Rock Core					
DATE CONSTRUCTED: 10/2/2012		N: 1393958 E:2202119.5					
				DEPTH FEET	ELEVATION FT, MSL		
				TOP OF RISER	-2.6	850.88	
				GROUND SURFACE		0.0	848.17
				BOTTOM OF GROUT			
				TOP OF SEAL		31.0	817.2
				TOP OF FILTER PACK		35.1	813.1
				BOTTOM OF RISER / TOP OF SCREEN		38.7	809.5
				BOTTOM OF SCREEN		48.7	799.5
				BOTTOM OF CASING		49.0	799.2





# BORING LOG

**BORING B-03**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/2/2012 COMPLETED 10/3/2012 GROUND ELEVATION 835 ft COORDINATES N 1394045.1 E 2202411.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY R. Tinsley CHECKED BY BORING DEPTH 42 ft.

GROUND WATER DEPTH: DURING 23 ft. COMP. DELAYED 22.5 ft. after 24 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Silt (ML) - Grass - brownish yellow, dry, SILT		SS -1	4.5	3-2-3 (5)		upper saprolite.
10		- brownish yellow, dry, medium stiff, SILT saprolite with relic bedding.		SS -2	9.5	2-3-3 (6)		10YR; powdery; Upper Saprolite.
15		- SAA		SS -3	14.5	2-3-4 (7)		upper saprolite.
20		- mottled deep red and gray, damp, stiff, SILT; with coarse grains of angular quartz; gneiss saprolite.		SS -4	19.5	1-6-5 (11)		upper saprolite.
25		Silt (ML)	810.5	SS	24.5	6-6-8		

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## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME  B-3	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550			
LOGGER: Rhonda Tinsley		DRILLING METHODS: HS Auger/HQ Rock Core			
DATE CONSTRUCTED: 10/3/2012		N: 1394045.1 E:2202411.5			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.78	837.78
2" Threaded Riser Cap					
GROUND SURFACE				0.0	834.86
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 6 bags cement 9 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				20.0	814.9
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 2.25 buckets PLACEMENT: Poured					
TOP OF FILTER PACK				24.2	810.7
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 2.5 Bags PLACEMENT: Poured					
BOTTOM OF RISER / TOP OF SCREEN				26.7	808.2
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				36.7	798.2
BOTTOM OF CASING				37.0	797.9
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)					





# BORING LOG

**BORING B-04**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/3/2012 COMPLETED 10/3/2012 GROUND ELEVATION 812.1 ft COORDINATES N 1394171.5 E 2202662.4

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY R. Tinsley CHECKED BY BORING DEPTH 46 ft.

GROUND WATER DEPTH: DURING 23 ft. COMP. DELAYED 12.2 ft. after 24 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b> - Thin topsoil with vegetation. - brown, SILT						
10		- yellowish brown, stiff, SILT saprolite, relic bedding prominent.		SS -1	4.5	3-3-6 (9)		10YR; upper saprolite.
15		- olive gray, medium stiff, SILT saprolite with fine to coarse-grained fragments.		SS -2	9.5	2-3-3 (6)		5YR; lower saprolite.
20		- damp, medium stiff, SAA		SS -3	14.5	2-2-4 (6)		
25		- wet, hard, SAA		SS -4	19.5	6-12-23 (35)		
				SS	24.5	6-11-12		WT @ 23'.

(Continued Next Page)





# BORING LOG

**BORING B-04**  
Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - very stiff, SAA		-5		(23)		
30		- hard, SAA		SS -6	29.5	10-18-23 (41)		
35		- very stiff, SAA		SS -7	34.5	6-11-13 (24)		
40		- stiff, SAA		SS -8	39.5	5-6-5 (11)		
45		- hard, SAA		SS -9	44.5	25-45 (45)		
			766.1					
		Bottom of borehole at 46.0 feet.						
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:43 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME			
Hydrogeologic Investigation		DRILLER: S. Denty					
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-4/B-4			
LOGGER: Rhonda Tinsley		DRILLING METHODS: HS Auger					
DATE CONSTRUCTED: 10/3/2012		N: 1394171.5 E:2202662.4					
				DEPTH FEET	ELEVATION FT, MSL		
				TOP OF RISER	-2.8	814.85	
				GROUND SURFACE		0.0	812.06
				BOTTOM OF GROUT			
				TOP OF SEAL		27.0	785.1
				TOP OF FILTER PACK		31.0	781.1
				BOTTOM OF RISER / TOP OF SCREEN		34.7	777.4
				BOTTOM OF SCREEN		44.7	767.4
				BOTTOM OF CASING		45.0	767.1
				HOLE DIA: 7 inch			





# BORING LOG

**BORING B-05**

Page 1 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 10/3/2012 **COMPLETED** 10/4/2012 **GROUND ELEVATION** 788.7 ft **COORDINATES** N 1394306.3 E 2202965.1

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** R. Tinsley **CHECKED BY** **BORING DEPTH** 30 ft.

**GROUND WATER DEPTH: DURING** 16 ft. **COMP.** **DELAYED** 0 ft. after 100 hrs.

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:43 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b> - reddish brown, SILT	784.2	SS -1	4.5	WH-WH-WH (0)		
10		<b>Silty Sand (SM)</b> - olive gray, damp, very loose, silty SAND to sandy SILT	779.2	SS -2	9.5	WH-WH-WH (0)		upper saprolite.
15		<b>Silt (ML)</b> - yellowish to light brown, damp, very soft, SILT with mica (gneiss)		SS -3	14.5	2-2-4 (6)		lower saprolite.
20		<b>Silt (ML)</b> - greenish gray, wet, medium stiff, sandy SILT saprolite with relic structure (gneiss).		SS -4	19.5	1-2-3 (5)		lower saprolite.
25		<b>Silt (ML)</b> - medium stiff, SAA		SS	24.5	50		
		<b>Silt (ML)</b> - very hard, SAA; slightly less weathered.						

(Continued Next Page)





# BORING LOG

**BORING B-05**  
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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

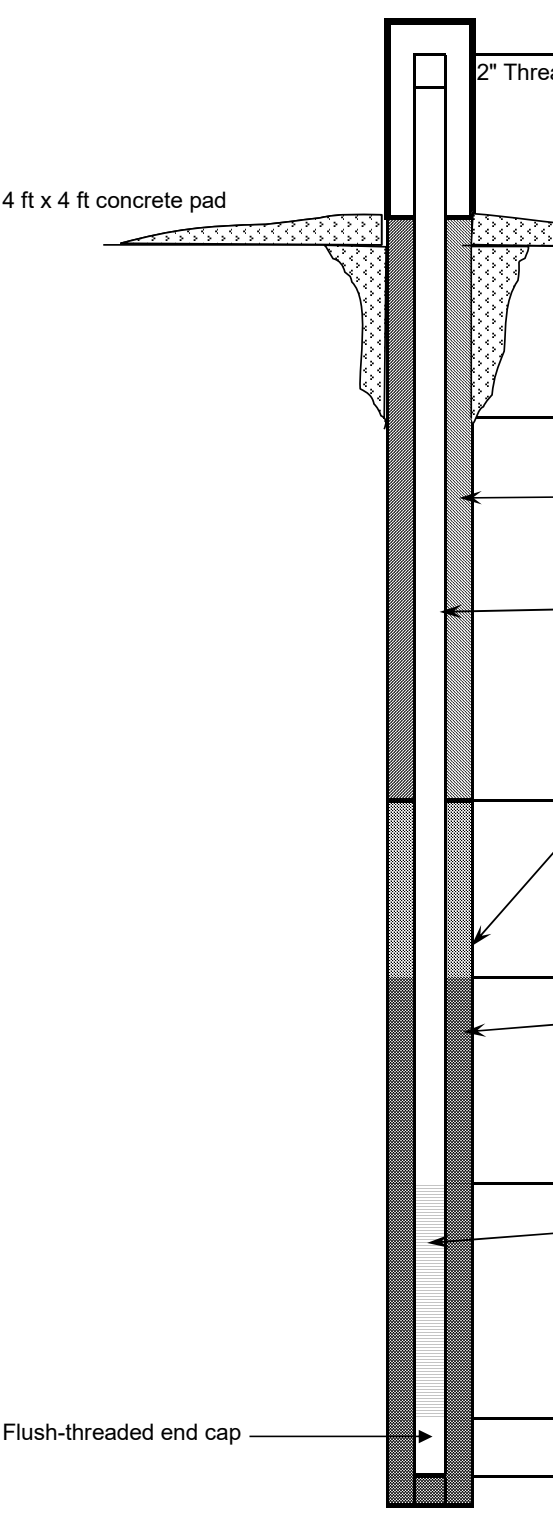
PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
30		<b>Gneiss</b> - black (biotite) and white, hard, slightly weathered, AUGEN GNEISS with water staining along foliations (approx. 45 degrees).	763.3	-5 RC -1	24.9	(0)		lower saprolite.
		Bottom of borehole at 30.0 feet.						
35								
40								
45								
50								



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-5/B-5		
LOGGER: Rhonda Tinsley		DRILLING METHODS: HS Auger/HQ Rock Core				
DATE CONSTRUCTED: 10/4/2012		N: 1394306.3 E:2202965.1				
				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-3.0	791.75
				2" Threaded Riser Cap		
GROUND SURFACE				0.0	788.64	
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum						
BOTTOM OF GROUT						
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5 bags cement 7 lbs bentonite						
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded						
TOP OF SEAL				12.0	776.6	
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 2 buckets PLACEMENT: Tremie						
TOP OF FILTER PACK				16.0	772.6	
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 1.5 Bags PLACEMENT: Tremie						
BOTTOM OF RISER / TOP OF SCREEN				19.7	768.9	
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch						
BOTTOM OF SCREEN				29.7	758.9	
Flush-threaded end cap						
BOTTOM OF CASING				30.0	758.6	
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)						





# BORING LOG

**BORING B-06**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/9/2012 COMPLETED 10/9/2012 GROUND ELEVATION 786.5 ft COORDINATES N 1394419.5 E 2203266.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 35.8 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED 7 ft. after 3 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Clayey Sand (SC)</b> - red-brown, damp, very loose, silty, clayey SAND; approximately 50% fine-grained sand, 20% clay, 20% silt, 10% organics. Organic rich horizon.	783.0					
5		<b>Silt (ML)</b> - red-tan, damp, clayey SILT with fine-grained sand  - gray to brownish yellow, stiff, clayey SILT to silty CLAY; 60% silt, 30% clay; 10% sand/gravel; contains small (1 to 2 mm) quartz feldspar gravel		SS -1	4.5	4-4-8 (12)		A horizon of residual soil.
10		- tan-brown w/orange and gray, very moist, very soft, clayey SILT, micaceous; 70% silt, 25% clay, 5% fine- grained sand		SS -2	9.5	1-1-1 (2)		B horizon of residual soil.
15		- tan-brown, very moist, very soft, clayey SILT to silty CLAY; 55% clay, 40% silt, approximately 5% fine- grained sand		SS -3	14.5	1-1-1 (2)		B horizon of residual soil.
20		- olive gray to tan--brown, dry, stiff, clayey SILT, weathered with some relic structure; 60% silt, 35% clay, 5% fine-grained sand		SS -4	19.5	3-5-6 (11)		Top of upper saprolite zone.
25				SS	24.5	12-32-46		

(Continued Next Page)





# BORING LOG

BORING B-06

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - tan-brown, very hard, clayey SILT with sand and gravel; contains highly weathered schist fragments; micaceous; 50% silt, 30% clay, 20% sand/gravel		-5		(78)		mid-lower saprolite.
30		- tan-brown, damp, very hard, sandy, gravelly, clayey SILT; 50% clayey silt, 50% sandy gravel; gravels are 1 mm to 10 mm in size, angular and gneissic in origin; highly weathered; contains some white leached quartz		SS -6	29.5	50 (0)		lower saprolite.
35		- brown, damp, very hard, clayey SILT; 40% clay, 60% silt; micaceous, contains relic structures		SS -7	34.5	27-50 (50)		lower saprolite.
			750.7					
		Bottom of borehole at 35.8 feet.						
40								
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		B-6	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/9/2012		N: 1394419.5 E: 2203266.5			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-3.0	789.47
2" Threaded Riser Cap					
GROUND SURFACE				0.0	786.45
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5 bags cement 7.5 lbs bentonite <b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded TOP OF SEAL				16.8	769.7
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 2 buckets PLACEMENT: Tremie TOP OF FILTER PACK				21.7	764.8
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 6 Bags PLACEMENT: Tremie BOTTOM OF RISER / TOP OF SCREEN				25.0	761.5
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch BOTTOM OF SCREEN				35.0	751.5
Flush-threaded end cap					
BOTTOM OF CASING				35.4	751.1
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-07**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/9/2012 COMPLETED 10/9/2012 GROUND ELEVATION 806.1 ft COORDINATES N 1394374.6 E 2203596.1

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 26 ft.

GROUND WATER DEPTH: DURING 18.5 ft. COMP. DELAYED 3.8 ft. after 18 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b> - brown to red-brown, damp, very soft, clayey SILT with trace sand; organic rich - red to red-tan, damp, soft, clayey SILT ▽	801.6	SS -1	4.5	3-3-3 (6)		O Horizon.
10		<b>Fat Clay (CH)</b> - tan, brown and orange, damp, medium stiff, silty CLAY; micaceous; relic foliations; 60% clay, 40% silt 796.6		SS -2	9.5	1-1-2 (3)		A-B Horizon / residual soils.  becomes very moist at 8.5'.  residual soil.
15		<b>Silt (ML)</b> - red-tan, very moist, soft, clayey SILT with trace fine sand; slightly micaceous; contains manganese - brown-red, very moist, soft, clayey SILT to silty CLAY with trace gravel; micaceous; prevalent manganese staining ▽		SS -3	14.5	1-1-3 (4)		residual soil.
20		<b>Silt (ML)</b> - olive gray (greenish), wet, medium stiff, clayey SILT; micaceous; contains relic schist fragments - olive gray to tan-brown, wet, stiff, clayey, gravelly SILT; contains manganese and moderately		SS -4	19.5	1-1-5 (6)		saturated from 18.5 to 19.5'.  residual soil.
25				SS	24.5	7-7-8		

(Continued Next Page)





# BORING LOG

**BORING B-07**  
Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		weathered gneissic fragments; relic structures preserved insome instances <b>Silt (ML)(con't)</b>	780.1	-5		(15)		upper saprolite.
30		Bottom of borehole at 26.0 feet.						
35								
40								
45								
50								



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		B-7	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/9/2012		N: 1394374.6 E:2203596.1			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-3.1	809.16
2" Threaded Riser Cap					
GROUND SURFACE				0.0	806.04
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 3 bags cement 1.75 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				7.6	798.4
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1.75 buckets PLACEMENT: Poured					
TOP OF FILTER PACK				12.7	793.3
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Poured					
BOTTOM OF RISER / TOP OF SCREEN				14.8	791.2
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				24.8	781.2
BOTTOM OF CASING				25.2	780.8
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-08**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/10/2012 COMPLETED 10/10/2012 GROUND ELEVATION 824.1 ft COORDINATES N 1394322.2 E 2203882.1

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 49.1 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED 17.04 ft. after 18 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b>  - tan-brown, dry, very soft, clayey SILT; micaceous; contains little quartz sand, no relic structures; 85% silt, 10% clay, 5% sand		SS -1	4.5	WH-WH-WH (0)		residual soil.
10		- tan to reddish brown, dry, medium stiff, clayey SILT; contains mica flakes and trace quartz sand; higher iron content and soil bonding; no relic structures		SS -2	9.5	3-3-5 (8)		residual soil.
15		- red-brown, damp, soft, clayey SILT; micaceous; contains trace of schist-derived gravel; higher clay percent, more plastic		SS -3	14.5	WH-1-2 (3)		residual soil.
20		- olive brown with black streaks and white layer, damp, very stiff, sandy SILT with clay; very micaceous; highly weathered original structure; contains sand and gravel derived from gneiss and a white bleached quartz lense		SS -4	19.5	20-16-10 (26)		transition to upper saprolite and higher moisture content.
25				SS	24.5	5-7-6		

(Continued Next Page)





# BORING LOG

**BORING B-08**

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - stiff, SAA; more coarse-grained sediment; coarse material is angular; less competent than above; some highly weathered relict structure		-5		(13)		starting to get H2O return to surface.
30		- very hard, SAA; more competent; rock fragments less weathered		SS -6	29.5	9-10-50 (60)		transition to lower saprolite.
35		- brown-black, damp, hard, gravelly SILT; contains highly to partially weathered relict gneiss fragments; micaceous; contains manganese streaks		SS -7	34.5	5-15-18 (33)		less weathered rock; again becoming partially weathered.
40		- brown black, damp, very hard, sandy SILT with gravel; contains black manganese, red iron and weathered quartz zones; less gneissic gravel than above; micaceous		SS -8	39.5	11-12-50 (62)		fewer rock fragments.
45		<b>Silty Gravel (GM)</b> - brown, tan and black, damp, very dense, silty GRAVEL; predominately weathered to partially weathered gneiss fragments	779.6	SS -9	44.5	17-50 (50)		transitioning to partially weathered rock.
50		Bottom of borehole at 49.1 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\1\APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-8/B-8	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/10/2012		N: 1394322.2 E:2203882.1			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.3	826.38
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	824.02
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum  BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 6.25 bags cement 9 lbs bentonite  <b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded  TOP OF SEAL				34.8	789.2
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Tremie w/water  TOP OF FILTER PACK				36.8	787.2
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Poured w/water  BOTTOM OF RISER / TOP OF SCREEN				38.7	785.3
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch  BOTTOM OF SCREEN				48.7	775.3
Flush-threaded end cap					
BOTTOM OF CASING				49.1	774.9
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-09**

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/10/2012 COMPLETED 10/10/2012 GROUND ELEVATION 821.8 ft COORDINATES N 1394055.9 E 2204170

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 30.1 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED 7.2 ft. after 15 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)</b>						no residual soil; low area previously excavated..
5		- red-brown, dry, stiff, fine SILT; relic schistose structures; soil is bonded and moderately competent but rubs to fine silt or clay		SS -1	4.5	4-6-9 (15)		upper saprolite.
10		- brown-tan, dry, very stiff, gravelly SILT; relic schistose or gneissic structure; rock fragments are more competent; rubs to fine silt with clay; contains manganese nodules and iron staining		SS -2	9.5	4-9-9 (18)		transition to lower saprolite.
15		- very stiff, SAA		SS -3	14.5	6-10-12 (22)		lower saprolite.
20		- very hard, SAA		SS -4	19.5	16-34-32 (66)		lower saprolite.
25		<b>Silty Gravel (GM)</b>	797.3	SS	24.5	51-15-25		

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# BORING LOG

**BORING B-09**  
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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
30		<b>Silty Gravel (GM)</b> (con't) - brown-black, damp, hard, silty GRAVEL; contains few rock fragments; crumbles to gravelly silt to silty gravel; manganese staining	791.7	-5		(40)		H2O return when pulling augers.
		- very hard, partially weathered rock; schist fragments; crumbles to gravel with minor silt; micaceous		SS -6	29.5	50 (0)		
		Bottom of borehole at 30.1 feet.						
35								
40								
45								
50								

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## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-9/ B-9	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/10/2012		N: 1394055.9 E:2204170.0			
				DEPTH	ELEVATION
				FEET	FT, MSL
				TOP OF RISER	-3.1 824.35
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	821.86
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5 bags cement 7 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				15.0	806.9
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				17.5	804.4
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				19.6	802.3
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				29.6	792.3
Flush-threaded end cap					
BOTTOM OF CASING				30.0	791.9
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-10**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/11/2012 COMPLETED 10/11/2012 GROUND ELEVATION 820.9 ft COORDINATES N 1393818.3 E 2204201.1

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 46 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Silt (ML)  - red to red-brown, soft, fine SILT with clay; sparse mica flakes; few angular to sub-angular quartz grains; soil is moderately well bonded		SS -1	4.5	2-2-2 (4)		residual soil.
10		- tan-brown with black streaks, dry, medium stiff, fine SILT with fine to medium-grained sand and gravel; contains few quartz gravels and highly weathered mica; rubs to silt and fine to medium-grained sand; manganese staining		SS -2	9.5	2-4-4 (8)		residual soil.
15		- stiff, SAA; less sand and gravel; better cemented/bonded		SS -3	14.5	3-4-5 (9)		
20		- medium stiff, SAA; softer		SS -4	19.5	1-2-4 (6)		
25				SS	24.5	2-3-4		

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

BORING B-10

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

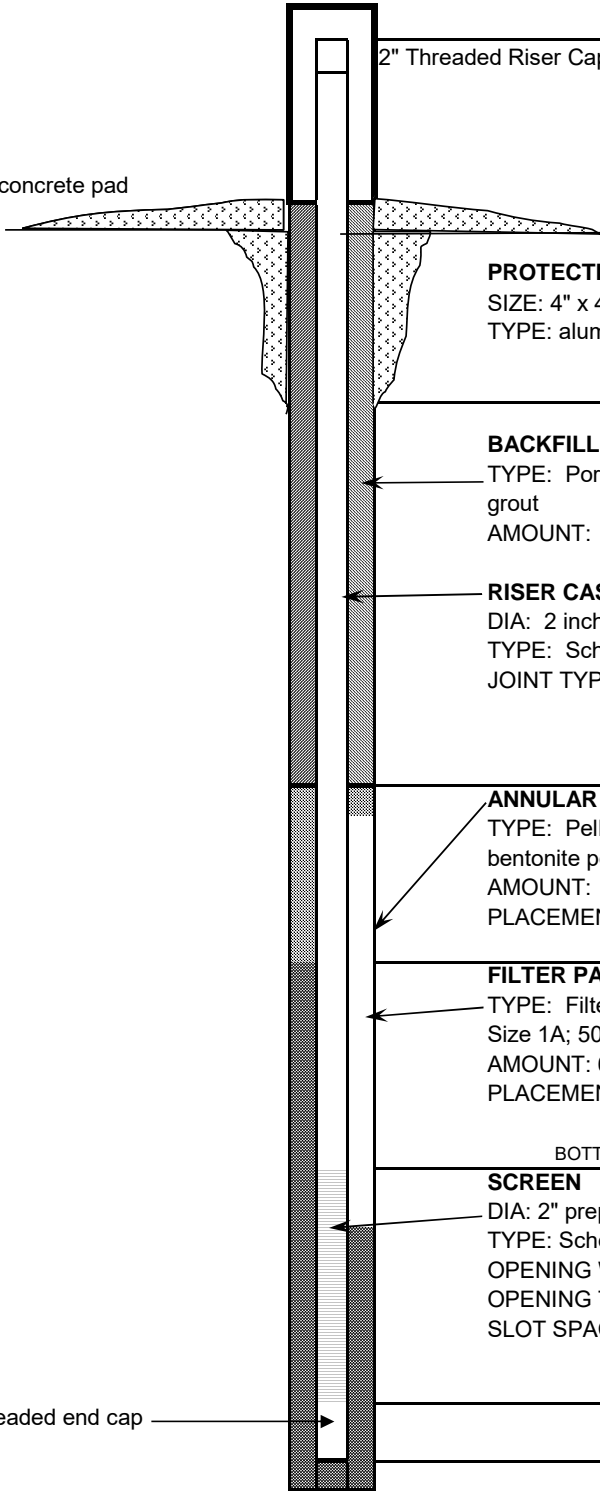
DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - very damp, medium stiff, SAA		-5		(7)		
30		- stiff, SAA; contains highly weathered schist fragments		SS -6	29.5	4-5-5 (10)		upper saprolite.
35		- brown, very damp, very stiff, gravelly SILT with clay; contains highly weathered schist fragments; samples crumble and rub to clayey silt.		SS -7	34.5	7-8-9 (17)		upper saprolite.
40		- hard, SAA; more rock fragments; less weathered		SS -8	39.5	6-12-16 (28)		lower saprolite.
45		- wet, hard, gravelly SILT; prevalent relict structures		SS -9	44.5			lower saprolite.
		Bottom of borehole at 46.0 feet.	774.9					
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME			
Hydrogeologic Investigation		DRILLER: S. Denty					
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-10/B-10			
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger					
DATE CONSTRUCTED: 10/11/2012		N: 1393818.3 E:2204201.1					
				DEPTH FEET	ELEVATION FT, MSL		
				TOP OF RISER	-2.6	823.55	
				2" Threaded Riser Cap			
				GROUND SURFACE		0.0	820.82
				PROTECTIVE CASING SIZE: 4" x 4" TYPE: aluminum			
				BOTTOM OF GROUT			
				BACKFILL MATERIAL TYPE: Portland cement/bentonite grout AMOUNT: 6 bags cement 9 lbs bentonite			
				RISER CASING DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded			
				TOP OF SEAL		29.8	791.0
				ANNULAR SEAL TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured			
				TOP OF FILTER PACK		32.1	788.7
				FILTER PACK TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 6.75 Bags PLACEMENT: Poured w/water			
				BOTTOM OF RISER / TOP OF SCREEN		35.0	785.8
				SCREEN DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch			
				BOTTOM OF SCREEN		45.0	775.8
				Flush-threaded end cap			
BOTTOM OF CASING		45.4	775.4				
HOLE DIA: 7 inch							





# BORING LOG

**BORING B-11**

Page 1 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 10/15/2012 **COMPLETED** 10/15/2012 **GROUND ELEVATION** 798.1 ft **COORDINATES** N 1393547.1 E 2204166.2

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** C. Sellers **CHECKED BY**  **BORING DEPTH** 51 ft.

**GROUND WATER DEPTH: DURING** 25 ft. **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Silt (ML)  - brownish red, medium stiff, fine SILT with clay; micaceous; slightly bonded		SS -1	4.5	2-3-4 (7)		
10		- brownish red, very stiff, fine SILT with clay; very micaceous; 10% clay		SS -2	9.5	12-12-15 (27)		
15		- damp, stiff, SAA; 20% clay; contains small schist gravel		SS -3	14.5	5-6-6 (12)		
20		- tan, damp, stiff, SAA		SS -4	19.5	4-5-7 (12)		
25				SS	24.5	5-8-11		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-11**  
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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - light tan, wet, very stiff, SAA; contains fine sand and small schist fragments		-5		(19)		
30		- stiff, SAA		SS -6	29.5	5-6-8 (14)		
35		- very stiff, SAA		SS -7	34.5	6-8-14 (22)		
40		- hard, SAA		SS -8	39.5	12-20-25 (45)		
45		- gray, very hard, SAA; contains schist gravel throughout		SS -9	44.5	26-50 (50)		
50		- dark gray, very hard, SAA		SS -10	49.5	50 (0)		
			747.1					
		Bottom of borehole at 51.0 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-11/B-11	
LOGGER: C. Sellers/K. Byrd		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/15/2012		N: 1393547.1 E:2204166.2			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.5	800.57
2" Threaded Riser Cap					
GROUND SURFACE				0.0	797.99
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 7 bags cement 10.5 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				33.9	764.1
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Tremie					
TOP OF FILTER PACK				36.2	761.8
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				38.8	759.3
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				48.8	749.2
Flush-threaded end cap					
BOTTOM OF CASING				49.1	748.9
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-12**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/15/2012 COMPLETED 10/15/2012 GROUND ELEVATION 771.2 ft COORDINATES N 1393149.4 E 2204128.3

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY K. Byrd CHECKED BY BORING DEPTH 26 ft.

GROUND WATER DEPTH: DURING 9 ft. COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Silt (ML)</b>  - brown/tan, damp, soft, SILT with some clay; micaceous		SS -1	4.5	1-2-2 (4)		
				UD -1	7.0			
10		<b>Lean Clay (CL)</b> - red/orange/light brown, wet, very soft, CLAY; contains sparse mica and fine sand grains	761.7	SS -2	9.5	WH-WH-WH (0)		
15		<b>Silt (ML)</b> - yellowish orange, wet, medium stiff, sandy SILT; very fine-grained	756.7	SS -3	14.5	WH-WH-7 (7)		
20		- light to olive gray, wet, very stiff, SILT; micaceous; contains heavily weathered schist fragments		SS -4	19.5	6-11-8 (19)		
25			746.2	SS	24.5	2-2-3		

(Continued Next Page)





# BORING LOG

**BORING B-12**

Page 2 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		- yellowish orange, damp, medium stiff, clayey SILT; micaceous		-5		(5)		
		Bottom of borehole at 26.0 feet.						
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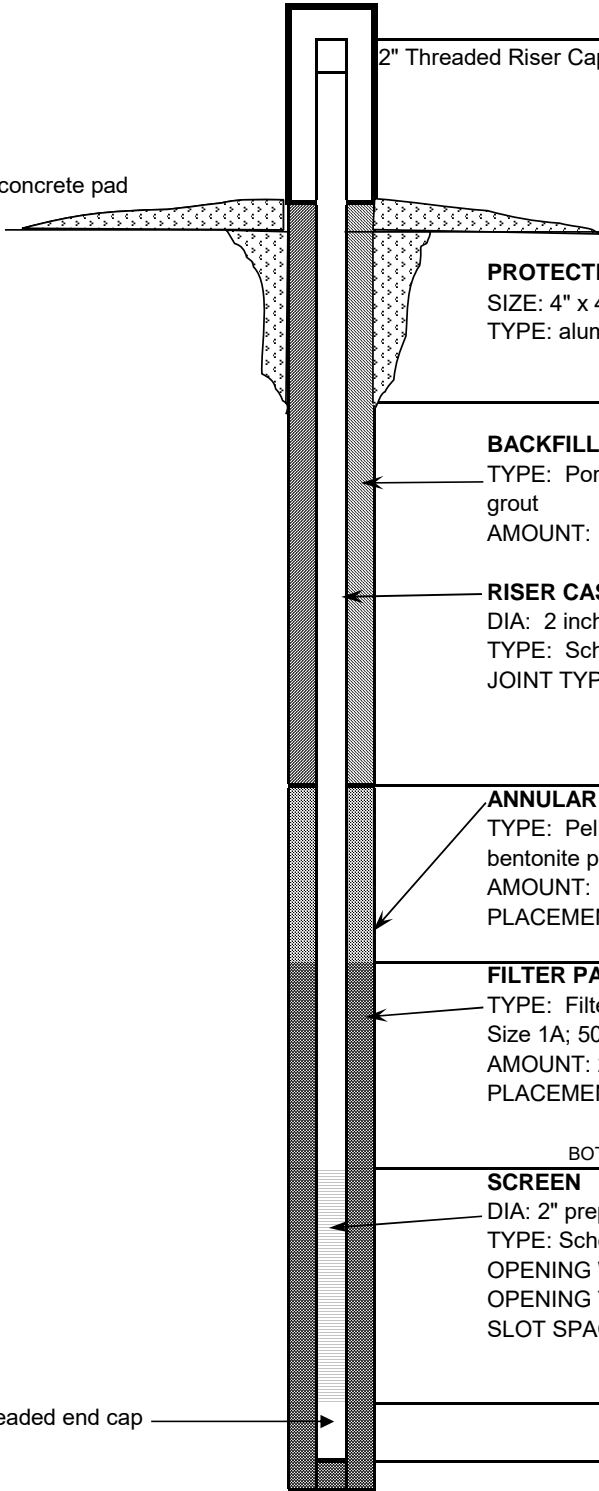
GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\$\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-12/B-12	
LOGGER: Kinsey Byrd		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 10/15/2012		N: 1393149.4 E:2204128.3			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.7	773.86
2" Threaded Riser Cap					
GROUND SURFACE				0.0	771.10
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 4 bags cement 6 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				10.2	760.9
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Tremie					
TOP OF FILTER PACK				12.6	758.5
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 2.5 Bags; 50 lbs/bag PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				14.7	756.4
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				24.7	746.4
BOTTOM OF CASING				25.1	746.0



4 ft x 4 ft concrete pad

2" Threaded Riser Cap

GROUND SURFACE

PROTECTIVE CASING  
SIZE: 4" x 4"  
TYPE: aluminum

BOTTOM OF GROUT

BACKFILL MATERIAL  
TYPE: Portland cement/bentonite grout  
AMOUNT: 4 bags cement  
6 lbs bentonite

RISER CASING  
DIA: 2 inch  
TYPE: Schedule 40 PVC  
JOINT TYPE: Flush Threaded

TOP OF SEAL

ANNULAR SEAL  
TYPE: PelPlug TR-30 3/8"  
bentonite pellets; 5-gallon buckets  
AMOUNT: 1 bucket  
PLACEMENT: Tremie

TOP OF FILTER PACK

FILTER PACK  
TYPE: Filtersil #61  
Size 1A; 50 lbs/bag  
AMOUNT: 2.5 Bags; 50 lbs/bag  
PLACEMENT: Tremie

BOTTOM OF RISER / TOP OF SCREEN

SCREEN  
DIA: 2" prepack (3.45" OD)  
TYPE: Schedule 40 PVC  
OPENING WIDTH: 0.01 inch  
OPENING TYPE: Slotted  
SLOT SPACING: 0.1 inch

BOTTOM OF SCREEN

BOTTOM OF CASING

Flush-threaded end cap

HOLE DIA: 7 inch





# BORING LOG

**BORING B-13**

Page 1 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 11/27/2012 **COMPLETED** 11/27/2012 **GROUND ELEVATION** 791.3 ft **COORDINATES** N 1392881.1 E 2204084.6

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** G. Dyer **CHECKED BY**  **BORING DEPTH** 46 ft.

**GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED** 26.73 ft. after 36 hrs.

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.0 ft						
5								
10			781.8	SS -1	9.5	21-50 (50)		
15		- mottled tan, brown and red with black manganese staining, dry, very hard, clayey SILT; saprolite		SS -2	14.5	18-30-50 (80)		
20		- damp, hard, SAA		SS -3	19.5	6-14-26 (40)		
25				SS	24.5	12-22-31		

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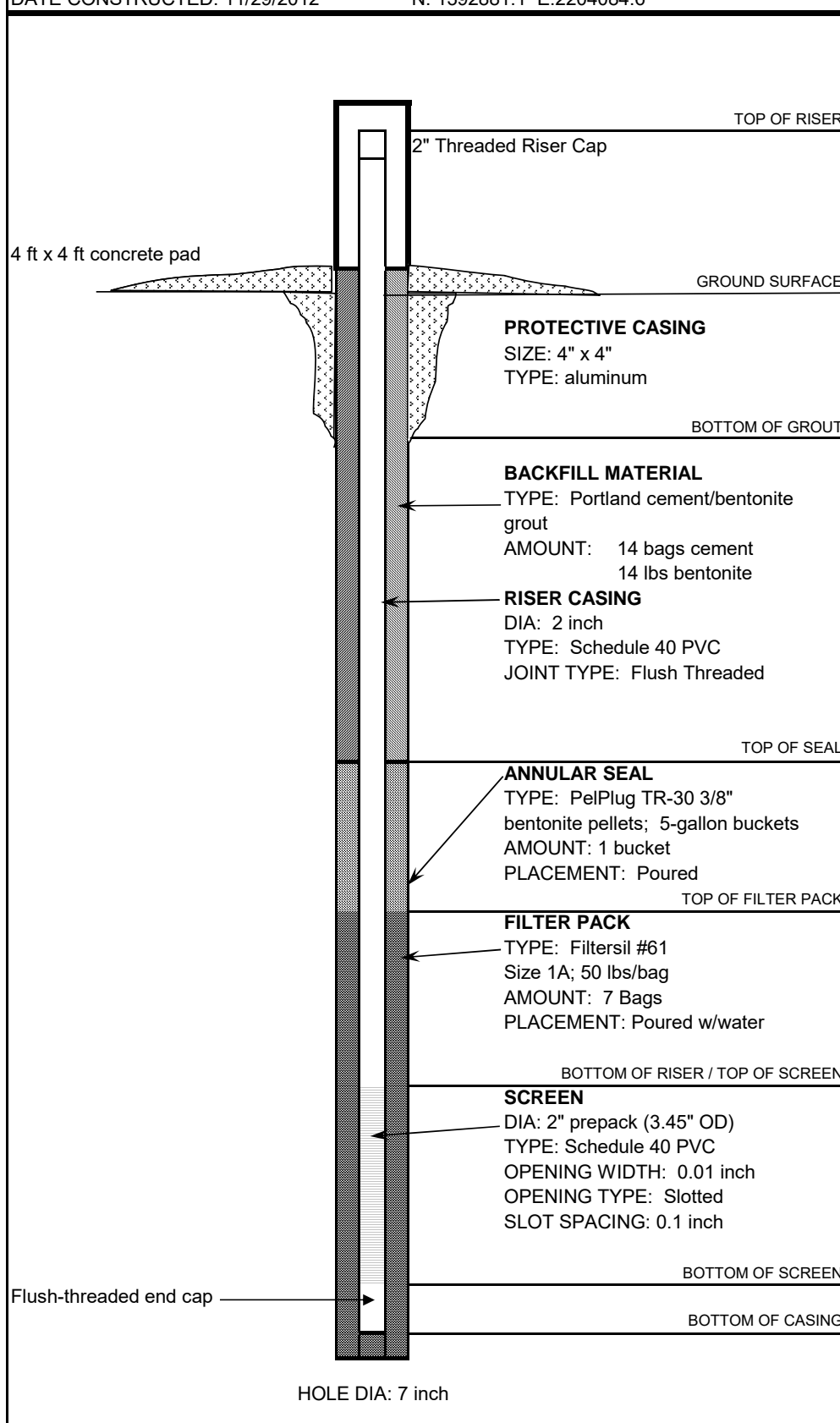


GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\ALTRCFP01\LAPARKER\$\DESKTOP\GPCIMW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME			
Hydrogeologic Investigation		DRILLER: S. Denty					
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-13/B-13			
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger					
DATE CONSTRUCTED: 11/29/2012		N: 1392881.1 E:2204084.6					
				DEPTH FEET	ELEVATION FT, MSL		
				TOP OF RISER	-2.8	794.10	
				2" Threaded Riser Cap			
				4 ft x 4 ft concrete pad			
				GROUND SURFACE		0.0	791.20
				<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum			
				BOTTOM OF GROUT			
				<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 14 bags cement 14 lbs bentonite			
				<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded			
				TOP OF SEAL		29.0	762.2
				<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured			
				TOP OF FILTER PACK		31.2	760.0
				<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Poured w/water			
				BOTTOM OF RISER / TOP OF SCREEN		33.4	757.8
				<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch			
				BOTTOM OF SCREEN		43.4	747.8
Flush-threaded end cap							
BOTTOM OF CASING		43.8	747.4				
HOLE DIA: 7 inch							





# BORING LOG

**BORING B-14**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 12/18/2012 COMPLETED 12/18/2012 GROUND ELEVATION 789.8 ft COORDINATES N 1392574.2 E 2204013.3

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY T. Milam LOGGED BY G. Dyer CHECKED BY BORING DEPTH 34.3 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.0 ft						
5								
10		<b>Silt (ML)</b> - tan with green and red-orange mottling, damp, soft, SILT; trace of schistose bedding; trace schist fragments; slightly micaceous and quartzose	780.8	SS -1	9.5	1-2-2 (4)		residual soil.  upper saprolite.
15		- brown and tan-red, dry, hard, SILT; consolidated and slightly hard; relict schistose bedding; trace schist fragments		SS -2	14.5	9-15-21 (36)		lower saprolite.
20		<b>Silty Gravel (GM)</b> - brown, tan and silver, dry, very hard, SAPROCK; predominately schist fragments; moderately weathered	770.3	SS -3	19.5	16-50 (50)		saprock/pwr.
25		- SAA; softer zone from 23' to 24'						
		<b>Schist</b>	765.5	SS	24.5	50		

(Continued Next Page)





# BORING LOG

BORING B-14

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
..... ..... ..... 30 ..... ..... ..... ..... 35		<p>- green, silver, black and white, BUTTON MICA SCHIST; heavily fractured; iron-staining; quartz banding; sheared foliations <b>Schist(con't)</b></p> <p>- gray, silver and black, SCHIST; fractured; iron staining; feldspar augens; shear foliation less common</p> <p>- green, silver, black and white, BUTTON MICA SCHIST; heavily fractured; prevalent iron-staining; feldspar augens; sheared</p> <p>- gray, MYLONITE; micaceous; slightly to moderately fractured; pyrite observed</p>	758.9   755.5	4		(0)		<p>prevalent iron-staining and manganese oxides.</p> <p>black dike or mylonite cross-cuts schist @ 45 degrees at 27.5'.</p>
..... ..... 40 ..... ..... 45 ..... ..... 50 ..... ..... ..... .....		Bottom of borehole at 34.3 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: T. Milam			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-14/B-14	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger/HQ Rock Core			
DATE CONSTRUCTED: 12/18/2012		N: 1392574.2 E:2204013.3			
			DEPTH	ELEVATION	
			FEET	FT, MSL	
			TOP OF RISER	-2.6	792.40
			2" Threaded Riser Cap		
4 ft x 4 ft concrete pad			GROUND SURFACE	0.0	789.69
			<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum		
			BOTTOM OF GROUT		
			<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 24 bags cement 30 lbs bentonite		
			<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
			TOP OF SEAL	12.5	777.2
			<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 0.75 bucket PLACEMENT: Poured/tremie pipe		
			TOP OF FILTER PACK	15.5	774.2
			<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 2 Bags PLACEMENT: poured w/water		
			BOTTOM OF RISER / TOP OF SCREEN	23.9	765.8
			<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch		
			BOTTOM OF SCREEN	33.9	755.8
Flush-threaded end cap			BOTTOM OF CASING	34.3	755.4
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)					





# BORING LOG

**BORING B-15**

Page 1 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 11/29/2012 **COMPLETED** 11/29/2012 **GROUND ELEVATION** 821.5 ft **COORDINATES** N 1392544.1 E 2203679

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** G. Dyer **CHECKED BY**  **BORING DEPTH** 67.2 ft.

**GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\1APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.0 ft						
5								
10		<b>Silt (ML)</b> - tan-red, dry, soft, SILT; about 3% clay; few schistose rock fragments; slightly micaceous	812.5	SS -1	9.5	2-1-2 (3)		residual soil.
15		- light tan, dry, medium stiff, SILT; homoeneous silt (no clay or sand); slightly micaceous; trae gneiss fragments near base of sample		SS -2	14.5	2-3-4 (7)		residual soil.
20		- gray to brown, dry, very hard, crumbles to sandy SILT; saprolite; fragmented soil largely consistent of moderately to highly weathered rock		SS -3	19.5	19-35-38 (73)		
25				SS	24.5	14-24-27		

(Continued Next Page)





# BORING LOG

**BORING B-15**

Page 2 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
29.5		<b>Silt (ML)(con't)</b> - green to dark tan, dry, very hard, crumbles to SILT with fine sand; relict schitose structure; lacks competent schist fragments; micaceous; trace quartz sand (about 5%)	777.0	SS -4	29.5	14-25-22 (47)		lower saprolite.
34.5		- tan to gray with black manganese, dry, hard, crumbles to sandy SILT; relict schistosity; more prevalent quartz (about 10%); slightly micaceous		SS -5	34.5	12-20-16 (36)		lower saprolite.
39.5		- olive green, tan and silver, dry, hard, crumbles to SILT with schist derived gravel; large mica flakes; trace fine quartz sand		SS -6	39.5	14-36-50 (86)		lower saprolite.
44.5		- olive green, tan and silver, moist, very hard, crumbles to SILT with clay; very micaceous; relict schitose structure; moderately weathered schist fragments	772.0	SS -7	44.5	50 (0)		transition from saprolite to saprock.
49.5		<b>Silty Gravel (GM)</b> - olive green, tan and black, moist, very hard, crumbles to silty GRAVEL; less weathered schist fragments		SS -8	49.5	14-21-26 (47)		lower saprolite.
50.0		<b>Silt (ML)</b> - olive to dark green and silver, damp, hard, crumbles to SILT with gravel and clay; relict schist structure and fragments		SS -9				

(Continued Next Page)





# BORING LOG

**BORING B-15**

Page 3 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

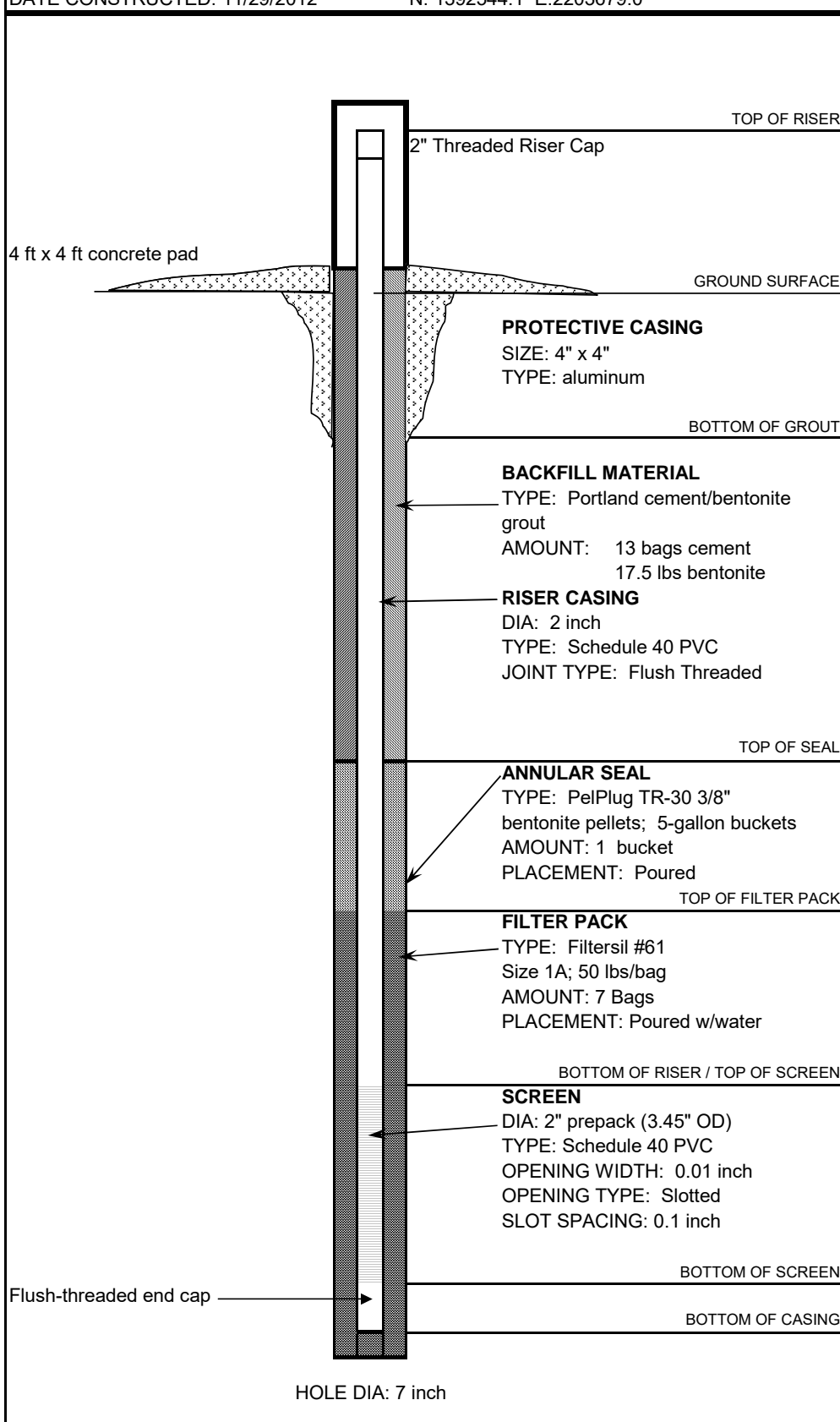
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Silty Gravel (GM)</b> - dark green and black, damp, very hard, weathered schist GRAVEL	767.0	SS -10	54.5	50 (0)		more competent saprock.
60		- very hard, SAA; damp to dry		SS -11	59.5	50 (0)		
65		- very hard, SAA		SS -12	64.5	50 (0)		
			754.3					
		Bottom of borehole at 67.2 feet.						
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-15/B-15		
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger				
DATE CONSTRUCTED: 11/29/2012		N: 1392544.1 E:2203679.0				
				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-3.0	824.50
				2" Threaded Riser Cap		
4 ft x 4 ft concrete pad				GROUND SURFACE	0.0	821.43
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum				BOTTOM OF GROUT		
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 13 bags cement 17.5 lbs bentonite						
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded				TOP OF SEAL	52.4	769.0
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured				TOP OF FILTER PACK	54.5	766.9
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Poured w/water				BOTTOM OF RISER / TOP OF SCREEN	56.7	764.7
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch				BOTTOM OF SCREEN	66.7	754.7
Flush-threaded end cap				BOTTOM OF CASING	67.1	754.3
HOLE DIA: 7 inch						





# BORING LOG

**BORING B-16**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 12/19/2012 COMPLETED 12/19/2012 GROUND ELEVATION 823.6 ft COORDINATES N 1392595.1 E 2203315.4

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY T. Milam LOGGED BY G. Dyer CHECKED BY BORING DEPTH 46 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9 ft						
5								
10		<b>Silt (ML)</b> - tan and brown, dry, stiff, SILT; slightly micaceous; trace manganese oxides	814.6	SS -1	9.5	3-4-5 (9)		residual soil.
15		- tan, brown and orange, dry, medium stiff, sandy SILT; sand is fine to very fine-grained; slightly micaceous; trace schistosity		SS -2	14.5	3-3-5 (8)		residual soil.
20		- light tan to brown, dry, medium stiff, SILT with clay (about 10%); clay is slightly plastic; slightly micaceous; trace schistose gravel; trace manganese oxide		SS -3	19.5	3-3-3 (6)		residual soil.
25				SS	24.5	2-3-3		

(Continued Next Page)





# BORING LOG

BORING B-16

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - medium stiff, SAA; silt more elastic		4		(6)		
30		- mottled tan, brown and black, moist, stiff, SILT; saprolite like relict structures; micaceous; weathered schistose foliations; trace gravel; trace manganese oxides		SS -5	29.5	7-5-6 (11)		upper saprolite.
35		- wet, stiff, SAA		SS -6	34.5	6-5-5 (10)		
40		- wet, stiff, SAA; more schist gravel and slightly less weathered		SS -7	39.5	5-6-5 (11)		
45		- wet, very stiff, SAA; slightly less weathered trend		SS -8	44.5	5-9-8 (17)		
		Bottom of borehole at 46.0 feet.	777.6					
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: T. Milam			
LOCATION: Ash Pond		RIG TYPE: CME550		B-16	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 12/19/2012		N: 1392595.1 E:2203315.4			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.9	826.47
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	823.54
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5.5 bags cement 8 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				26.5	797.0
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.75 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				29.2	794.3
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 4.5 Bag PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				33.4	790.1
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				43.4	780.1
Flush-threaded end cap					
BOTTOM OF CASING				43.7	779.8
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-17**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 1/9/2012 COMPLETED 1/9/2012 GROUND ELEVATION 834.2 ft COORDINATES N 1392645.6 E 2203051

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 46 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		- Vacuum excavation from 0 ft to 15.0 ft						
10								
15			819.2	SS -1	15.0	2-2-3 (5)		residual soil.
20		<b>Silt (ML)</b> - brown to brown tan, damp, medium stiff, SILT with fine sand and clay; micaceous; contains black manganese oxides; trace quartz sand		SS -2	19.5	4-6-9 (15)		upper saprolite.
25		- brown, damp, stiff, SILT with clay; highly weathered relict structure; micaceous; trace manganese oxides		SS	24.5	3-5-6		

(Continued Next Page)





# BORING LOG

BORING B-17

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

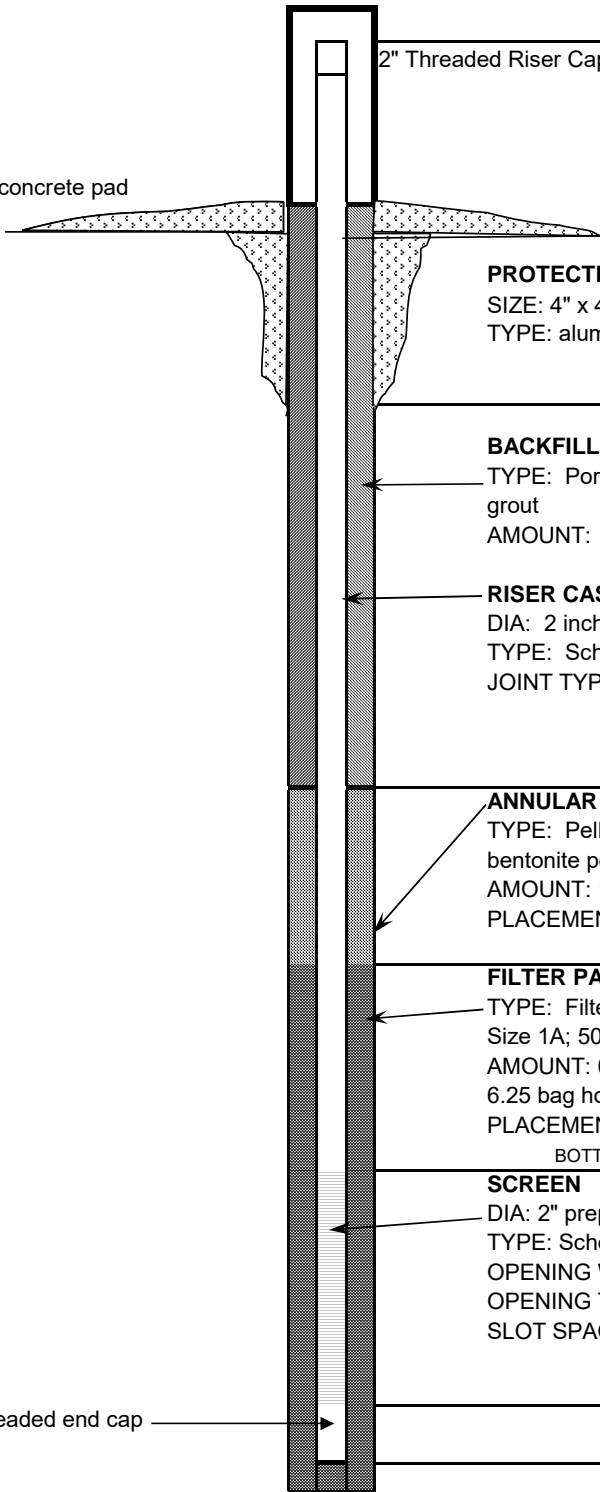
DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - tan and green, damp, stiff, highly weathered relic structure; micaceous		-3		(11)		upper saprolite.
30		- green to mottled green, black, yellow and tan, wet, stiff, SILT with fine sand; trace unweathered quartz gravel within weathered relic structure; heavy manganese oxide staining; micaceous		SS -4	29.5	2-3-6 (9)		upper saprolite.
35		- wet, stiff, SAA; more cemented; trace pyrite in/around weathered zones		SS -5	34.5	4-6-9 (15)		
40		- dark green and tan, very moist, very hard, SILT with gravel; micaceous; quartz sand; relict structures intact; trace manganese oxides; highly to slightly weathered schist fragments		SS -6	39.5	19-50 (50)		lower saprolite.
45		- green-gray, very moist, hard, SILT with clay; micaceous; trace quartz sand; relict structures but highly weathered; black manganese oxides	788.2	SS -7	44.5	16-19-20 (39)		lower saprolite.
		Bottom of borehole at 46.0 feet.						
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\ALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME			
Hydrogeologic Investigation		DRILLER: S. Denty					
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-17/B-17			
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger					
DATE CONSTRUCTED: 1/9/2013		N: 1392645.6 E:2203051.0					
				DEPTH FEET	ELEVATION FT, MSL		
				TOP OF RISER	-2.8	837.05	
				2" Threaded Riser Cap			
				4 ft x 4 ft concrete pad			
				GROUND SURFACE		0.0	834.14
				<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum			
				BOTTOM OF GROUT			
				<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 20 bags cement 30.5 lbs bentonite			
				<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded			
				TOP OF SEAL		30.0	804.1
				<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured			
				TOP OF FILTER PACK		32.0	802.1
				<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 6.25 bag hole PLACEMENT: Poured w/water			
				BOTTOM OF RISER / TOP OF SCREEN		34.2	799.9
				<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch			
				BOTTOM OF SCREEN		44.2	789.9
Flush-threaded end cap							
BOTTOM OF CASING		44.5	789.6				
HOLE DIA: 7 inch							





# BORING LOG

**BORING B-18**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 1/9/2012 COMPLETED 1/9/2012 GROUND ELEVATION 823.9 ft COORDINATES N 1392521 E 2202875.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 31 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED 11 ft. after 24 hrs.

NOTES Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 18.0 ft						
5								
10								
15								
20		Silt (ML)  - tan-orange, wet, medium stiff, SILT with clay; trace quartz gravel; mica flakes; trace relict structures but highly weathered	805.9	SS -1	19.5	2-3-5 (8)		residual soil-upper saprolite transition.
25				SS	24.5	3-5-6		

(Continued Next Page)





# BORING LOG

BORING B-18

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - mottled tan, green, gray and black, very moist, stiff, SILT; highly weathered relict structures; prevalent manganese oxides; trace gravel and clay		-2		(11)		residual soil-upper saprolite transition.
30		- more tan-gray, soft, SAA	792.9	SS -3	29.5	1-2-2 (4)		
		Bottom of borehole at 31.0 feet.						
35								
40								
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		B-18	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 1/9-10/2013		N: 1392521 E: 2202875.5			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.7	826.56
2" Threaded Riser Cap					
GROUND SURFACE				0.0	823.89
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 28 bags cement 42 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				18.0	805.9
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				19.2	804.7
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 5.5 bags hole PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				22.4	801.5
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				32.4	791.5
Flush-threaded end cap					
BOTTOM OF CASING				32.6	791.3
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-19**

Page 1 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 3/12/2013 **COMPLETED** 3/12/2013 **GROUND ELEVATION** 822.9 ft **COORDINATES** N 1392342.6 E 2202601

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** B. Gallagher **CHECKED BY**  **BORING DEPTH** 41 ft.

**GROUND WATER DEPTH: DURING**  **COMP.** 28 ft. **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		<b>Fill (ML)</b> - SILT						
10		<b>Silt (ML)</b>  - olive, tan, moist, medium stiff, SILT with fine sand and clay; micaceous; with iron oxide staining	816.9	SS -1	10.0	5-4-4 (8)		Vaccum excavation from 0 ft to 10 ft. Soil identified based on observation during vacuum excavation.
15		- wet, medium stiff		SS -2	14.5	2-3-3 (6)		residual soil.
20		- moist, very stiff, more iron oxide staining below 19 ft		SS -3	19.5	2-4-6 (10)		
25				SS	24.5	3-3-4		

(Continued Next Page)





**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\ALTRCFP01\LAPARKER\$\DESKTOP\GPCIMW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond 3		RIG TYPE: CME550		DGWC-19/B-19	
LOGGER: B. Gallagher		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 3/12/2013		N: 1392342.6 E:2202601.0			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.6	825.46
2" Threaded Riser Cap					
GROUND SURFACE				0.0	822.87
PROTECTIVE CASING SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
BACKFILL MATERIAL TYPE: Portland cement/bentonite grout AMOUNT: 16 bags cement 23 lbs bentonite					
RISER CASING DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				24.7	798.2
ANNULAR SEAL TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				27.2	795.7
FILTER PACK TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				29.4	793.5
SCREEN DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				39.4	783.5
Flush-threaded end cap					
BOTTOM OF CASING				39.8	783.1
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-20**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 3/4/2012 COMPLETED 3/4/2012 GROUND ELEVATION 819.8 ft COORDINATES N 1392164.5 E 2202315.6

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY R. Tinsley CHECKED BY BORING DEPTH 41 ft.

GROUND WATER DEPTH: DURING 2 ft. COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0								
5								
10								
10			809.8	SS -1	10.0	2-2-5 (7)		
15				SS -2	14.5	4-4-5 (9)		
20				SS -3	19.5	4-7-9 (16)		
25				SS	24.5	4-6-8		

(Continued Next Page)





# BORING LOG

BORING B-20

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - olive green, stiff, SAA		-4		(14)		
30		- stiff, SAA		SS -5	29.5	6-9-10 (19)		
35		- stiff, SAA with heavy staining		SS -6	34.5	3-4-5 (9)		
40		- SAA	778.8	SS -7	39.5	5-7-7 (14)		
		Bottom of borehole at 41.0 feet.						
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\LPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-20/B-20	
LOGGER: Rhonda Tinsley		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 3/5/2013		N: 1392164.5 E:2202315.6			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.3	822.14
2" Threaded Riser Cap					
GROUND SURFACE				0.0	819.66
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 9 bags cement 12 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				24.7	795.0
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				26.7	793.0
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 6.5 Bags PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				29.1	790.6
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				39.1	780.6
BOTTOM OF CASING				39.7	780.0
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-21**

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/31/2012 COMPLETED 10/31/2012 GROUND ELEVATION 813.5 ft COORDINATES N 1392067.5 E 2202063.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY D. Brooks CHECKED BY BORING DEPTH 69.1 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation form 0 ft to 9.5 ft						
5								
10		<b>Clayey Silty Sand (SC-SM)</b> - orange and tan, moist, loose, silty, clayey SAND; micaceous; fine to very fine-grained	804.0	SS -1	9.5	3-3-4 (7)		
15		<b>Silty Sand (SM)</b> - tan, orange and black, damp, loose, silty SAND; micaceous; very fine-grained	799.0	SS -2	14.5	4-3-6 (9)		
20		- tan, orange and black, damp, medium dense, silty SAND; micaceous; fine-grained		SS -3	19.5	6-10-20 (30)		upper saprolite.
25				SS	24.5	10-16-18		

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-21**  
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**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silty Sand (SM)(con't)</b> - hard, SAA		4		(34)		
30		- tan and orange, damp, very stiff, silty SAND with gravel; relic structure present; fine to medium-grained		SS -5	29.5	7-10-12 (22)		saprolite.
35		- olive, orange and black, hard, SAA		SS -6	34.5	18-22-20 (42)		lower saprolite.
40		- olive and black, very hard, SAA		SS -7	39.5	18-25-45 (70)		
45		- olive and tan, damp, hard, silty SAND; relict structure; fine-grained		SS -8	44.5	9-16-21 (37)		saprolite.
50		- hard, SAA		SS -9	49.5	16-21-19 (40)		

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SEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\ALTRCF001\LAPARKER\$\DESKTOP\GPC\MW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-21/B-21	
LOGGER: Dustin Brooks		DRILLING METHODS: HS Auger/HQ Rock Core			
DATE CONSTRUCTED: 10/31/2012		N: 1392067.5 E:2202063.5			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.8	816.28
2" Threaded Riser Cap					
GROUND SURFACE				0.0	813.47
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 15 bags cement 20 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				51.2	762.3
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie					
TOP OF FILTER PACK				56.4	757.1
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 0.5 bag hole PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				58.6	754.9
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				68.6	744.9
BOTTOM OF CASING				69.0	744.5
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)					





# BORING LOG

**BORING B-22**

Page 1 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 10/25/2012 **COMPLETED** 10/25/2012 **GROUND ELEVATION** 813.7 ft **COORDINATES** N 1392126.3 E 2201791.9


**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** C. Sellers **CHECKED BY**  **BORING DEPTH** 59.5 ft.

**GROUND WATER DEPTH: DURING** 20 ft. **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		<b>Silt (ML)</b> - brown, very stiff, SILT; micaceous	804.2	SS -1	9.5	6-9-9 (18)		upper saprolite.
15		- tan, very moist, medium stiff, SILT; contains very fine sand and mica		SS -2	14.5	3-3-5 (8)		
20		 - wet, very stiff, SAA		SS -3	19.5	10-11-15 (26)		
25				SS	24.5	3-4-4		

(Continued Next Page)





# BORING LOG

**BORING B-22**

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - brown, medium stiff, SILT; contains fine sand and mica		4		(8)		
30		- dark brown to dark gray, wet, hard, weathered schist		SS -5	29.5	10-16-19 (35)		lower sparolite.
35		- very hard, SAA		SS -6	34.5	50 (0)		
40		- brown to orange, wet, very hard		SS -7	39.5	10-15-50 (65)		
45		- black, weathered schist	769.2	SS -8	44.5	50 (0)		
		<b>Schist</b> - very weathered SCHIST with mud in fractures		RC -1	44.8			
50		- very fractured BIOTITE GNEISS with schist-like features; red staining	764.2	RC -2	49.5			
		<b>Gneiss</b>						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

BORING B-22

Page 3 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Gneiss</b> (con't)  - GNEISS (mylonite); fractures throughout; stained	754.2	RC-3	54.5			
60	Bottom of borehole at 59.5 feet.							
65								
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\$\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL	
Hydrogeologic Investigation		DRILLER: S. Denty		NAME	
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-22/B-22	
LOGGER: Cale Sellers		DRILLING METHODS: HS Auger/HQ Rock Core			
DATE CONSTRUCTED: 10/25/2012		N: 1392126.3 E:2201791.9			
				DEPTH	ELEVATION
				FEET	FT, MSL
TOP OF RISER				-2.9	816.59
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	813.69
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 9 bags cement 12.5 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				44.6	769.1
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.25 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				47.7	766.0
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 1 Bag PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				49.7	764.0
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				59.7	754.0
Flush-threaded end cap					
BOTTOM OF CASING				60.0	753.7
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)					





# BORING LOG

**BORING B-23**

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/24/2012 COMPLETED 10/25/2012 GROUND ELEVATION 815.7 ft COORDINATES N 1392239.7 E 2201582

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY C. Sellers CHECKED BY BORING DEPTH 59.4 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		- Vacuum excavation from 0 ft to 9.5 ft						
10		<b>Silt (ML)</b> - dark brown, wet, medium stiff, clayey SILT with gravel (schist)	806.2	SS -1	9.5	3-3-3 (6)		
15		- dark gray, very soft, clayey SILT; contains wood		SS -2	14.5	WH-1-1 (2)		
20		- light purple-gray, stiff, SILT; very fine-grained		SS -3	19.5	1-3-7 (10)		
25		<b>Silty Sand (SM)</b>	791.2	SS	24.5	10-14-16		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-23**

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**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silty Sand (SM)</b> (con't) - light tan, damp, medium dense, silty SAND; fine to very fine-grained; micaceous		4		(30)		
30		- dark gray to brown, loose, angular gravel at top of sample; saprolite at bottom		SS -5	29.5	7-5-2 (7)		
35		- dark gray to brown, very dense, saprolite		SS -6	34.5	13-17-50 (67)		
40		- light tan to white, very dense, saprolite (silty); micaceous		SS -7	39.5	50 (0)		
45		- no sample obtained		SS -8	44.5			
			768.6	RC -1	47.1			
50		- weathered GNEISS; vertical fractures and red staining throughout		RC -2	49.4			

(Continued Next Page)





# BORING LOG

**BORING B-23**  
Page 3 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Gneiss</b> (con't)  - light gray, GNEISS; some fractures	756.3	RC-3	54.4			
60	Bottom of borehole at 59.4 feet.							
65								
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-23/B-23		
LOGGER: Cale Sellers		DRILLING METHODS: HS Auger/HQ Rock Core				
DATE CONSTRUCTED: 10/25/2012		N: 1392239.7 E:2201582.0				
				DEPTH FEET	ELEVATION FT, MSL	
TOP OF RISER				-2.7	818.37	
2" Threaded Riser Cap						
4 ft x 4 ft concrete pad				GROUND SURFACE	0.0	815.63
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum				BOTTOM OF GROUT		
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 8 bags cement 11 lbs bentonite						
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded				TOP OF SEAL	42.9	772.7
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.25 bucket PLACEMENT: Tremie				TOP OF FILTER PACK	46.8	768.8
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 1 Bag PLACEMENT: Tremie				BOTTOM OF RISER / TOP OF SCREEN	49.8	765.8
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch				BOTTOM OF SCREEN	59.8	755.8
Flush-threaded end cap				BOTTOM OF CASING	60.1	755.5
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)						





# BORING LOG

**BORING B-24**

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/24/2012 COMPLETED 10/24/2012 GROUND ELEVATION 819.3 ft COORDINATES N 1392479.9 E 2201450

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY C. Sellers CHECKED BY BORING DEPTH 79.1 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		- Vacuum excavation from 0 ft to 9.5 ft						
10			809.8	SS -1	9.5	WH-1-1 (2)		
15		- light gray, very soft, SILT with very fine to fine-grained sand		SS -2	14.5	3-4-6 (10)		
20		- stiff, SAA; very micaceous		SS -3	19.5	5-4-4 (8)		
25		- light tan to brown, medium stiff, SILT; very fine to fine-grained; micaceous; 2" quartz		SS	24.5	19-37-50		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

BORING B-24

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - wet, very hard, SILT; saprolite (weathered gneiss); banding		-4		(87)		
30				SS -5	29.5	50 (0)		
35		- SAA		SS -6	34.5	50 (0)		
40				SS -7	39.5	50 (0)		
45				SS -8	44.5	50 (0)		
50		- SAA; contains gneiss fragments		SS -9	49.5	50 (0)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-24**

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**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Silt (ML)(con't)</b> - SAA		SS -10	54.5	50 (0)		
			760.2	RC -1	59.1			
60		<b>Gneiss</b> - light gray to orange, highly weathered, GNEISS; highly fractured, vertical and horizontal						
				RC -2	64.1			
65		- light gray with red staining, SAA						
				RC -3	69.1			
70		- SAA						
				RC -4	74.1			
75								
			740.2					
80		Bottom of borehole at 79.1 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\1\APARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ



## Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME
Hydrogeologic Investigation		DRILLER: S. Denty		
LOCATION: Ash Pond		RIG TYPE: CME550		
LOGGER: Cale Sellers		DRILLING METHODS: HS Auger/HQ Rock Core		B-24
DATE CONSTRUCTED: 10/24/2012		N: 1392479.9 E:2201450.0		
		DEPTH FEET	ELEVATION FT, MSL	
	TOP OF RISER	-2.8	822.11	
	2" Threaded Riser Cap			
4 ft x 4 ft concrete pad	GROUND SURFACE	0.0	819.19	
	<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum			
	BOTTOM OF GROUT			
	<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 21 bags cement 30 lbs bentonite			
	<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded			
	TOP OF SEAL	60.8	758.4	
	<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.25 bucket PLACEMENT: Poured			
	TOP OF FILTER PACK	65.9	753.3	
	<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 2.5 Bags PLACEMENT: Poured w/water			
	BOTTOM OF RISER / TOP OF SCREEN	68.3	750.9	
	<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch			
	BOTTOM OF SCREEN	78.3	740.9	
Flush-threaded end cap	BOTTOM OF CASING	79.1	740.1	
	HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)			





# BORING LOG

**BORING B-25**

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/23/2012 COMPLETED 10/24/2012 GROUND ELEVATION 833.5 ft COORDINATES N 1392813.3 E 2201502.7

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY B. Gallagher CHECKED BY BORING DEPTH 54.8 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		Silt (ML)	824.0	SS -1	9.5	1-2-2 (4)		no recovery.
15		- tan, dry, very hard, saprolite; micaceous, sandy with 1 inch lense of white feldspar at 14.8 ft.		SS -2	14.5	22-50 (50)		
20		- black and white, very hard, SAA; weathered gneiss saprolite		SS -3	19.5	18-36-50 (86)		
25				SS	24.5	25		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-25**

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**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - black and white, dry, weathered gneiss		4		(0)		
			806.5	RC -1	27.0			
30		<b>Gneiss</b>  - black and white, medium hard to hard, slightly weathered - two 1/2" augens and weathered joints at 28.5 ft		RC -2	29.8			
35		- soft, weathered and broken from 29.1 to 30.2 ft - joint filled with secondary minerals from 30.2 to 30.7 ft - slightly weathered joints at 31.0, 31.3, and 31.6 ft  - 1/4" augen with four slightly weathered joints across foliation from 32.3 to 33.0 ft  - 3 inch weathered soft zone @ 34.5 ft		RC -3	34.8			
40		- 2" quartzite at 42 ft; very little staining; vertical fractures from 40ft to 42ft		RC -4	39.8			
45		- SAA		RC -5	44.8			
50		- weathered; staining in and around fractures		RC -6	49.8			

(Continued Next Page)





# BORING LOG

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55	/		778.7					
		Bottom of borehole at 54.8 feet.						
60								
65								
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\$\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550			
LOGGER: B. Gallagher		DRILLING METHODS: HS Auger/HQ Rock Core		B-25	
DATE CONSTRUCTED: 10/24/2012		N: 1392813.3 E:2201502.7			
				DEPTH	ELEVATION
				FEET	FT, MSL
TOP OF RISER				-3.0	836.54
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	833.41
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 10 bags cement 14 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				40.1	793.3
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.25 bucket PLACEMENT: Tremie					
TOP OF FILTER PACK				42.4	791.0
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 1 Bag; 50 lbs/bag PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				44.4	789.0
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				54.4	779.0
Flush-threaded end cap					
BOTTOM OF CASING				54.8	778.6
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)					





# BORING LOG

**BORING B-26**

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/16/2012 COMPLETED 10/23/2012 GROUND ELEVATION 850.6 ft COORDINATES N 1393105.6 E 2201550.4

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY Sellers/Byrd/Gallager CHECKED BY BORING DEPTH 49.3 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		- Vacuum excavation from 0 ft to 9.5 ft						
10			841.1	SS -1	9.5	4-4-6 (10)		
15		- Silt (ML) - tan with white, pink and dark brown layering, stiff, sandy SILT; heavily weathered; micaceous; fine-grained		SS -2	14.5	3-5-9 (14)		
20		- stiff, SAA; heavily weathered gneiss		SS -3	19.5	17-24-27 (51)		
25		- dry, very hard, SAA; more compact with better foliation than previous samples; less sand		SS	24.5	50		

(Continued Next Page)





# BORING LOG

**BORING B-26**

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - dry, very hard, SAA; powdered rock	824.6	RC -4	26.0	(0)		
30		<b>Gneiss</b> - black and white, fine grain, medium hard to hard, slightly to moderately weathered, banded, GNEISS - from 27.0' to 27.3' - soft, weathered, leached of biotite, stained below; 1.4" thick augen - 1/2" thick augen with remnant, healed fractures across foliation at 28'; slight staining on joint across foliation from 28.6' to 28.7' - stain on joints, one joint on foliation and one joint across foliation at 29.3' to 29.7'		RC -2	28.9			
35		- 3 stained and leached, weathered joints from 31.4' to 32.2'; augen - 3 stained joints across foliation from 32.7' to 33.0', including a soil coated joint at 33' - slightly stained joints on foliation at 33.1', 33.6', and 34.1' to 34.7'		RC -3	33.9			
40		- stained, leached, weathered zone with many 1/4" quartz phenocrysts from 35.8' to 36.6'		RC -4	39.0			
45		- soft weathered zone with staining from 39.0' to 39.7' - heavily stained, soft joints across foliation at 41.3' - 1/2" augen at 42.0' - weathered broken zone from 43.6' to 44.1' - below 44.1' heavily stained with many quartz phenocrysts - stained joint across foliation at 45.5'		RC -5	44.1			
50		Bottom of borehole at 49.3 feet.	801.3					

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\1\APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550				
LOGGER: Ben Gallagher		DRILLING METHODS: HS Auger/HQ Rock Core				
DATE CONSTRUCTED: 10/23/2012		N: 1393105.6 E:2201550.4		B-26		
				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-3.0	853.60
2" Threaded Riser Cap						
4 ft x 4 ft concrete pad						
GROUND SURFACE				0.0	850.61	
PROTECTIVE CASING SIZE: 4" x 4" TYPE: aluminum						
BOTTOM OF GROUT						
BACKFILL MATERIAL TYPE: Portland cement/bentonite grout AMOUNT: 7 bags cement 10 lbs bentonite						
RISER CASING DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded						
TOP OF SEAL				30.5	820.1	
ANNULAR SEAL TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.25 bucket PLACEMENT: Tremie						
TOP OF FILTER PACK				34.8	815.8	
FILTER PACK TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 0.5 bag hole PLACEMENT: Tremie						
BOTTOM OF RISER / TOP OF SCREEN				38.9	811.7	
SCREEN DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch						
BOTTOM OF SCREEN				48.9	801.7	
Flush-threaded end cap						
BOTTOM OF CASING				49.3	801.3	
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)						





# BORING LOG

**BORING B-27**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/16/2012 COMPLETED 10/16/2012 GROUND ELEVATION ft COORDINATES N E

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY C. Sellers/K. Byrd CHECKED BY BORING DEPTH 34.4 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft					
5							
10		<b>Gneiss</b> - dark gray, biotite GNEISS; heavily weathered	SS -1	9.5	50 (0)		
15		- tan brown, weathered GNEISS; reddish brown quartz vein at 14.5'; sparse mica	SS -2	14.5	9-22-44 (66)		
20		- SAA; micaceous	SS -3	19.5	6-9-14 (23)		oxidation features.
25			RC -1	24.4			

(Continued Next Page)





# BORING LOG

**BORING B-27**  
Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
30		<b>Gneiss</b> (con't) - GNEISS; micaceous flakes; fractures and iron (red) staining  - SAA; feldspar throughout	RC -2	29.4			only fragments recovered; started coring.  90% feldspar layers, 3.5" thick @ 25 ft and 29 ft.
35		Bottom of borehole at 34.4 feet.					
40							
45							
50							

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



# Well Abandoned

## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550			
LOGGER: C. Sellers/K. Byrd		DRILLING METHODS: HS Auger		B-27	
DATE CONSTRUCTED: 10/16/2012		N: 1393423.51 E:2201744.77			
				DEPTH	ELEVATION
				FEET	FT, MSL
TOP OF RISER				-3.3	850.29
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	846.9
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5.5 bags cement 8 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				17.0	829.9
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie					
TOP OF FILTER PACK				21.0	825.9
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 0.5 bag hole PLACEMENT: Tremie					
BOTTOM OF RISER / TOP OF SCREEN				24.0	822.9
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				34.0	812.9
Flush-threaded end cap					
BOTTOM OF CASING				34.4	812.5
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-28**

Page 1 of 4

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 10/30/2012 **COMPLETED** 10/30/2012 **GROUND ELEVATION** 813.3 ft **COORDINATES** N 1391967.4 E 2201679.2

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** D. Brooks **CHECKED BY**  **BORING DEPTH** 94.3 ft.

**GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		<b>Gneiss</b> - no recovery; encountered boulder	803.8	SS -1	9.5			
		<b>Silty Sand (SM)</b>	802.3					
15		- green and black, saprolite; relict structure present		SS -2	14.5			
20		- brown and tan, damp, silty SAND; micaceous; fine-grained		SS -3	19.5			
25				SS	24.5	4-5-7		

(Continued Next Page)





# BORING LOG

**BORING B-28**

Page 2 of 4

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silty Sand (SM)</b> (con't) - SC-SM: tan, orange, and black, damp, medium dense, silty, clayey SAND; fine to very fine-grained		-4		(12)		
30		- medium dense, SAA; micaceous; clay content increases		SS -5	29.5	7-7-7 (14)		
35			778.8	SS -6	34.5	5-16-23 (39)		
40		- tan, orange, and black, stiff, sandy SILT; micaceous; some relict structure		SS -7	39.5	5-5-6 (11)		
45		- hard, SAA		SS -8	44.5	7-16-20 (36)		
50		- very hard, SAA		SS -9	49.5	20-20 (20)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-28**

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**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Silt (ML)(con't)</b> - very hard, minimal recovery; partially weathered rock		SS -10	54.5	50 (0)		
			754.1					
60		<b>Gneiss</b> - black and gray, mylonite GNEISS (schistic zone); weathering noted along small joints and along foliations (saprock), otherwise fresh; no staining seen		RC -1	59.2			
65		- black and gray, hard, mylonite GNEISS; fresh		RC -2	64.3			
70		- SAA		RC -3	69.3			
75		- SAA		RC -4	74.3			
80		- SAA with small iron-stained joint at 83'		RC -5	79.3			

(Continued Next Page)





# BORING LOG

**BORING B-28**  
Page 4 of 4

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
85		Gneiss( <i>con't</i> )		RC -6	84.3			
90		- black and gray, hard, GNEISS; fresh		RC -7	89.3			
			719.0					
95		Bottom of borehole at 94.3 feet.						
100								
105								
110								

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\APARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME  B-28		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550				
LOGGER: Dustin Brooks		DRILLING METHODS: HS Auger/HQ Rock Core				
DATE CONSTRUCTED: 10/31/2012		N: 1391967.4 E: 2201679.2				
				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-2.8	816.08
2" Threaded Riser Cap						
4 ft x 4 ft concrete pad						
GROUND SURFACE				0.0	813.28	
PROTECTIVE CASING SIZE: 4" x 4" TYPE: aluminum						
BOTTOM OF GROUT						
BACKFILL MATERIAL TYPE: Portland cement/bentonite grout AMOUNT: 14 bags cement 19 lbs bentonite						
RISER CASING DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded						
TOP OF SEAL				53.0	760.3	
ANNULAR SEAL TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie						
TOP OF FILTER PACK				55.6	757.7	
FILTER PACK TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 0.5 bag hole PLACEMENT: Tremie						
BOTTOM OF RISER / TOP OF SCREEN				59.0	754.3	
SCREEN DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch						
BOTTOM OF SCREEN				69.0	744.3	
Flush-threaded end cap						
BOTTOM OF CASING				69.4	743.9	
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)						





# BORING LOG

**BORING B-29**

Page 1 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 1/10/2012 **COMPLETED** 1/11/2012 **GROUND ELEVATION** 813.5 ft **COORDINATES** N 1391890 E 2201422

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** G. Dyer **CHECKED BY**  **BORING DEPTH** 55.7 ft.

**GROUND WATER DEPTH: DURING**  **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 10 ft						
5								
10			803.5					
		<b>Silt (ML)</b>						
		- tan-red, damp, medium stiff, clayey SILT, no structures or staining		SS -1	12.0	2-2-4 (6)		residual soil.
15		- tan, brown, and orange-red, damp, stiff, SILT with clay; vertical manganese oxide bands; highly weathered relict structure; slightly micaceous		SS -2	14.5	2-5-6 (11)		residual soil - upper saprolite.
20		- red, green and gray, very hard, sandy SILT; highly weathered schist fragments; relict structure intact; moderately to well cemented; trace partially weathered rock fragments		SS -3	19.5	9-28-29 (57)		lower saprolite.
25				SS	24.5	2-11-14		

(Continued Next Page)





# BORING LOG

**BORING B-29**

Page 2 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - green-gray and tan, dry, very stiff, sandy SILT; moderately to well cemented; structure intact; lacks rock fragments; micaceous; trace quartz sand		4		(25)		lower saprolite.
30		- green-gray, moist, very hard, GRAVEL and SILT; moderately weathered schist fragments		SS -5	29.5	28-50 (50)		lower saprolite/transitioning to saprock.
35		- very damp, very hard, SAA		SS -6	34.5	24-50 (50)		spoon moist to wet.
40		- dry, very hard, SAA		SS -7	39.5	50 (0)		saprock transition.
45								
50		- green-gray, wet, very hard, fine SILT with gravel; noticeably softer than previous runs; isolated schist fragments near base; little to no structure		SS -8	49.5	11-29-50 (79)		noticeable sound of water flowing.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\1\APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		B-29	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 1/11/2013		N: 1391890.0 E: 2201422.0			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.9	816.43
2" Threaded Riser Cap					
4 ft x 4 ft concrete pad					
GROUND SURFACE				0.0	813.47
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 10 bags cement 13.5 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				40.0	773.5
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				42.0	771.5
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 5.5 Bags PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				44.1	769.4
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				54.1	759.4
Flush-threaded end cap					
BOTTOM OF CASING				54.4	759.1
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-31**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 1/22/2013 COMPLETED 1/22/2013 GROUND ELEVATION 794.9 ft COORDINATES N 1392034.3 E 2200928.5

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit; HQ Rock Core EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY B. Gallagher CHECKED BY BORING DEPTH 45.1 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Drilled near North Abutment of Ash Pond 1 dike Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Silt (ML)						
10				SS -1	10.0	8-7-6 (13)		Vacuum excavation from 0 ft to 10 ft.
15		- white and tan, moist, foliated; saprolite		SS -2	14.5	7-8-17 (25)		
20				SS -3	19.5	7-17-12 (29)		
25		- tan, damp, stained below 20.5 ft		SS	24.5	3-6-12		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\ALTRCF01\LAPARKER\$\DESKTOP\GPC\MW LOGS SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services	WELL NAME
Hydrogeologic Investigation		DRILLER: S. Denty	
LOCATION: Ash Pond 1		RIG TYPE: CME550	B-31
LOGGER: B. Gallagher		DRILLING METHODS: HS Auger/HQ Rock Core	
DATE CONSTRUCTED: 1/22/2013		N: 1392034.3 E: 2200928.5	
		DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER		-2.6	797.47
2" Threaded Riser Cap			
4 ft x 4 ft concrete pad			
GROUND SURFACE		0.0	794.84
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum BOTTOM OF GROUT			
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 5 bags cement 8 lbs bentonite <b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded TOP OF SEAL		25.7	769.1
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1/4 bucket PLACEMENT: Poured TOP OF FILTER PACK		29.1	765.7
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 1/2 Bags PLACEMENT: Tremie BOTTOM OF RISER / TOP OF SCREEN		34.7	760.1
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch BOTTOM OF SCREEN		44.7	750.1
Flush-threaded end cap BOTTOM OF CASING		45.1	749.7
HOLE DIA: 7 inch (auger) 3.8 inch (HQ core)			

**ABANDONMENT NOTES:**

Abandoned on 10/4/2023  
 Tremmie grouted 25lbs  
 Aquagard/7 gallons water  
 Overdrilled to 10 feet bgs.; 10-  
 feet PVC removed.  
 Final Grout: 38 lbs  
 Quickrete/10 lbs  
 AquaGuard/6.5 gallons water.





# BORING LOG

**BORING B-37**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 11/28/2012 COMPLETED 11/28/2012 GROUND ELEVATION 763.7 ft COORDINATES N 1390482.2 E 2200919.8

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 41 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation fro 0 ft to 9.0 ft						
5								
10		<b>Silt (ML)</b> - tan to mottled tan, brown and red, damp, soft, SILT with clay (about 5% clay); micaceous; trace schistose texture (highly weathered)	754.7	SS -1	9.5	1-1-3 (4)		residual soil.
15		- yellow tan, medium stiff, SAA		SS -2	14.5	2-2-3 (5)		residual soil.
20		- tan, yellow and green banding, soft, SAA; softer; less clay		SS -3	19.5	1-1-2 (3)		residual soil.
25				SS	24.5	2-2-4		

(Continued Next Page)





# BORING LOG

BORING B-37

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

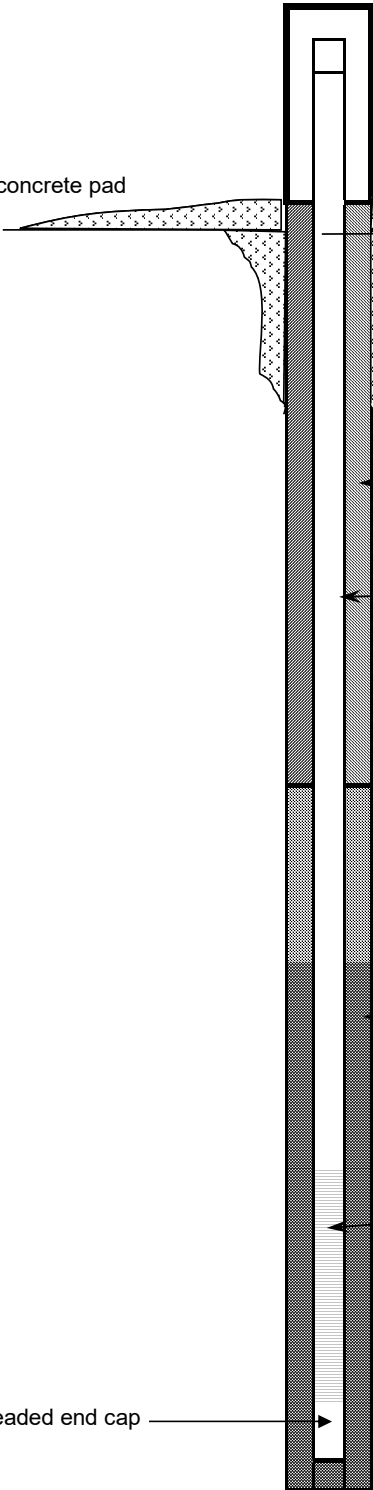
DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - green-gray, moist, medium stiff, SILT; micaceous; lacks structure		-4		(6)		
30		- mottled tan, green, and white-gray, very damp, stiff, sandy SILT		SS -5	29.5	4-5-7 (12)		upper saprolite.
35		- brown, very hard, SILT with gravel; saprolite; highly weathered schist fragments		SS -6	34.5	50 (0)		lower saprolite.
40		- brown, very moist, very hard, sandy SILT, weathered schist fragments		SS -7	39.5	22-32-23 (55)		lower saprolite.
			722.7					
		Bottom of borehole at 41.0 feet.						
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\LA\PARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-37/B-37		
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger				
DATE CONSTRUCTED: 11/28/2012		N: 1390482.2 E:2200919.8				
				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-2.5	766.21
2" Threaded Riser Cap						
4 ft x 4 ft concrete pad				GROUND SURFACE	0.0	763.64
						
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum						
BOTTOM OF GROUT						
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 20 bags cement 10 lbs bentonite						
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded						
TOP OF SEAL				24.6	739.0	
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1.5 buckets PLACEMENT: Poured						
TOP OF FILTER PACK				27.0	736.6	
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 6.75 Bags PLACEMENT: Poured w/water						
BOTTOM OF RISER / TOP OF SCREEN				29.3	734.3	
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch						
BOTTOM OF SCREEN				39.3	724.3	
Flush-threaded end cap						
BOTTOM OF CASING				39.7	723.9	
HOLE DIA: 7 inch						





# BORING LOG

**BORING B-38**

Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 11/28/2012 COMPLETED 11/28/2012 GROUND ELEVATION 754.7 ft COORDINATES N 1390362.7 E 2201148.6

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 24.7 ft.

GROUND WATER DEPTH: DURING 13 ft. COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.0 ft						
5								
10		<b>Silt (ML)</b> - olive-gray to tan, moist, medium stiff, SILT; micaceous; trace schist gravel; <5% clay	745.7	SS -1	9.5	2-3-4 (7)		residual soil.
15		- more tan, wet, very soft, SAA		SS -2	14.5	WH-WH-1 (1)		
20		- tan-brown-gray, very moist, stiff, SILT; micaceous; more prevalent schistose gravel		SS -3	19.5	2-4-5 (9)		residual soil.
25		- SAA with very fine-grained sand	730.0					

Bottom of borehole at 24.7 feet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough	DRILLING CO.: SCS Field Services	WELL NAME
Hydrogeologic Investigation	DRILLER: S. Denty	
LOCATION: Ash Pond	RIG TYPE: CME550	DGWC-38/B-38
LOGGER: Greg Dyer	DRILLING METHODS: HS Auger	
DATE CONSTRUCTED: 11/29/2012	N: 1390362.7 E:2201148.6	

	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.7	757.43
2" Threaded Riser Cap		
4 ft x 4 ft concrete pad		
GROUND SURFACE	0.0	754.67
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum		
BOTTOM OF GROUT		
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 4 bags cement 6 lbs bentonite		
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	10.4	744.3
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1.25 bucket PLACEMENT: Poured		
TOP OF FILTER PACK	13.4	741.3
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 5.25 Bags PLACEMENT: Poured w/water		
BOTTOM OF RISER / TOP OF SCREEN	14.7	740.0
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch		
BOTTOM OF SCREEN	24.7	730.0
Flush-threaded end cap		
BOTTOM OF CASING	25.0	729.7
HOLE DIA: 7 inch		





# BORING LOG

**BORING B-39**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 10/6/2012 COMPLETED 10/6/2012 GROUND ELEVATION 757 ft COORDINATES N 1390303.6 E 2201540.1

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 26 ft.

GROUND WATER DEPTH: DURING 20 ft. COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		<b>Elastic Silt (MH)</b> - tan, wet, medium stiff, medium plasticity, clayey SILT with fine sand	747.5	UD -1	9.5			water table in hydrovac hole at about 2 ft bgs.
15		<b>Silt (ML)</b> - tan-brown, wet, medium stiff, sandy SILT; contains schist gravel at base	741.8	SS -1	14.5	1-2-6 (8)		residual soil.
20		<b>Silt (ML)</b> - mottled tan, orange and brown, wet, medium stiff, clayey SILT; micaceous		SS -2	19.5	2-2-5 (7)		residual soil/upper saprolite transition.
25		<b>Lean Clay (CL)</b>	732.5	SS	24.5	3-2-4		

(Continued Next Page)





# BORING LOG

**BORING B-39**  
Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation  
LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		- mottled tan, brown and black, damp, medium stiff, low plasticity, silty CLAY; relict structures observed; highly weathered <b>Lean Clay (CL)(con't)</b>	731.0	-3		(6)		upper saprolite.
		Bottom of borehole at 26.0 feet.						
30								
35								
40								
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\$\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME
Hydrogeologic Investigation		DRILLER: S. Denty		
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-39/B-39
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger		
DATE CONSTRUCTED: 11/6/2012		N: 1390303.6 E:2201540.1		
		DEPTH	ELEVATION	
		FEET	FT, MSL	
		TOP OF RISER	-2.9	759.89
		2" Threaded Riser Cap		
4 ft x 4 ft concrete pad		GROUND SURFACE	0.0	756.93
		<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum		
		BOTTOM OF GROUT		
		<b>BACKFILL MATERIAL</b> TYPE: Bentonite Plug grout AMOUNT: 4 buckets 200 lbs bentonite		
		<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
		TOP OF SEAL	4.9	752.0
		<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 3.5 buckets PLACEMENT: Poured		
		TOP OF FILTER PACK	8.0	748.9
		<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 11 Bags PLACEMENT: Poured w/water		
		BOTTOM OF RISER / TOP OF SCREEN	10.8	746.1
		<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch		
		BOTTOM OF SCREEN	20.8	736.1
Flush-threaded end cap		BOTTOM OF CASING	21.2	735.7
HOLE DIA: 7 inch				





# BORING LOG

**BORING B-40**

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DATE STARTED 11/5/2012 COMPLETED 11/5/2012 GROUND ELEVATION 776.2 ft COORDINATES N 1390625.7 E 2201825.9

CONTRACTOR SCS Field Services METHOD 4.25" Hollow Stem Auger w/pilot bit EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY G. Dyer CHECKED BY BORING DEPTH 36 ft.

GROUND WATER DEPTH: DURING COMP. DELAYED

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		<b>Silt (ML)</b> - brown-tan, stiff, clayey, sandy SILT; damp to moist; contains micaceous fragments; manganese staining and nodules	766.7	SS -1	9.5	2-4-5 (9)		residual soil.
15		- tan to tan-brown, damp, stiff, sandy SILT; contains highly weathered schist; manganese staining		SS -2	14.5	4-5-6 (11)		upper saprolite.
20		- mottled tan, brown, and black, very moist, clayey SILT with sand; highly weathered schist fragments; 10% micaceous sand		SS -3	19.5	4-3-4 (7)		upper saprolite; increased water content.
25				SS	24.5	7-11-12		

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ

(Continued Next Page)





# BORING LOG

BORING B-40

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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
..... ..... ..... ..... 30		<b>Silt (ML)(con't)</b> - white-gray, very moist, very stiff, SILT with clay; trace quartz sand; micaceous in parts; leached zone		-4		(23)		weathered quartz vein or feldspar rich zone.
..... ..... ..... ..... 35		- brown, very moist, very stiff, SILT with clay and trace gravel; trace quartz/feldspar gravel		SS -5	29.5	6-9-10 (19)		upper saprolite.
..... ..... ..... ..... 50		- white-gray brown, very moist, medium stiff, SILT with clay and trace gravel; clay is more plastic		SS -6	34.5	1-1-4 (5)		
			740.2					
..... ..... 40		Bottom of borehole at 36.0 feet.						
..... ..... ..... ..... 45								
..... ..... ..... ..... 50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME	
Hydrogeologic Investigation		DRILLER: S. Denty			
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-40/B-40	
LOGGER: Greg Dyer		DRILLING METHODS: HS Auger			
DATE CONSTRUCTED: 11/5/2012		N: 1390625.7 E:2201825.9			
				DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER				-2.9	779.06
2" Threaded Riser Cap					
GROUND SURFACE				0.0	776.12
<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum					
BOTTOM OF GROUT					
<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 6 bags cement 6 lbs bentonite					
<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
TOP OF SEAL				19.0	757.1
<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured					
TOP OF FILTER PACK				21.4	754.7
<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 0.5 Bag filter pac 6.5 bag hole PLACEMENT: Poured w/water					
BOTTOM OF RISER / TOP OF SCREEN				24.5	751.6
<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch					
BOTTOM OF SCREEN				34.5	741.6
Flush-threaded end cap					
BOTTOM OF CASING				34.9	741.2
HOLE DIA: 7 inch					





# BORING LOG

**BORING B-41**

Page 1 of 3

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 11/13/2012 **COMPLETED** 11/14/2012 **GROUND ELEVATION** 792.4 ft **COORDINATES** N 1390920.8 E 2201751.9

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** C. Sellers **CHECKED BY**  **BORING DEPTH** 61 ft.

**GROUND WATER DEPTH: DURING** 35 ft. **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10		<b>Lean Clay (CL)</b> - light tan/orange, very soft, silty CLAY (fill for parking lot)	782.9	SS -1	9.5	WH-WH-1 (1)		
15		<b>Silt (ML)</b> - no recovery - medium stiff	777.9	SS -2	14.5	3-2-4 (6)		
20		- brownish orange, dry, stiff, clayey SILT with mica		SS -3	19.5	4-4-5 (9)		
25				SS	24.5			

(Continued Next Page)





# BORING LOG

**BORING B-41**  
Page 2 of 3

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft.)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - light tan, SILT; micaceous		4				
30		- stiff, SAA; with very fine-grained sand		SS -5	29.5	2-4-9 (13)		
35		▽ - wet, medium stiff, SAA		SS -6	34.5	2-2-3 (5)		
40		- brown, wet, stiff, SILT with fine to very fine sand		SS -7	39.5	2-3-6 (9)		
45		- stiff, SAA		SS -8	44.5	2-5-7 (12)		
50		- light tan, damp, hard, sandy SILT (saprolite); fine to very fine-grained sand		SS -9	49.5	11-18-23 (41)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ

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# BORING LOG

**BORING B-41**  
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SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

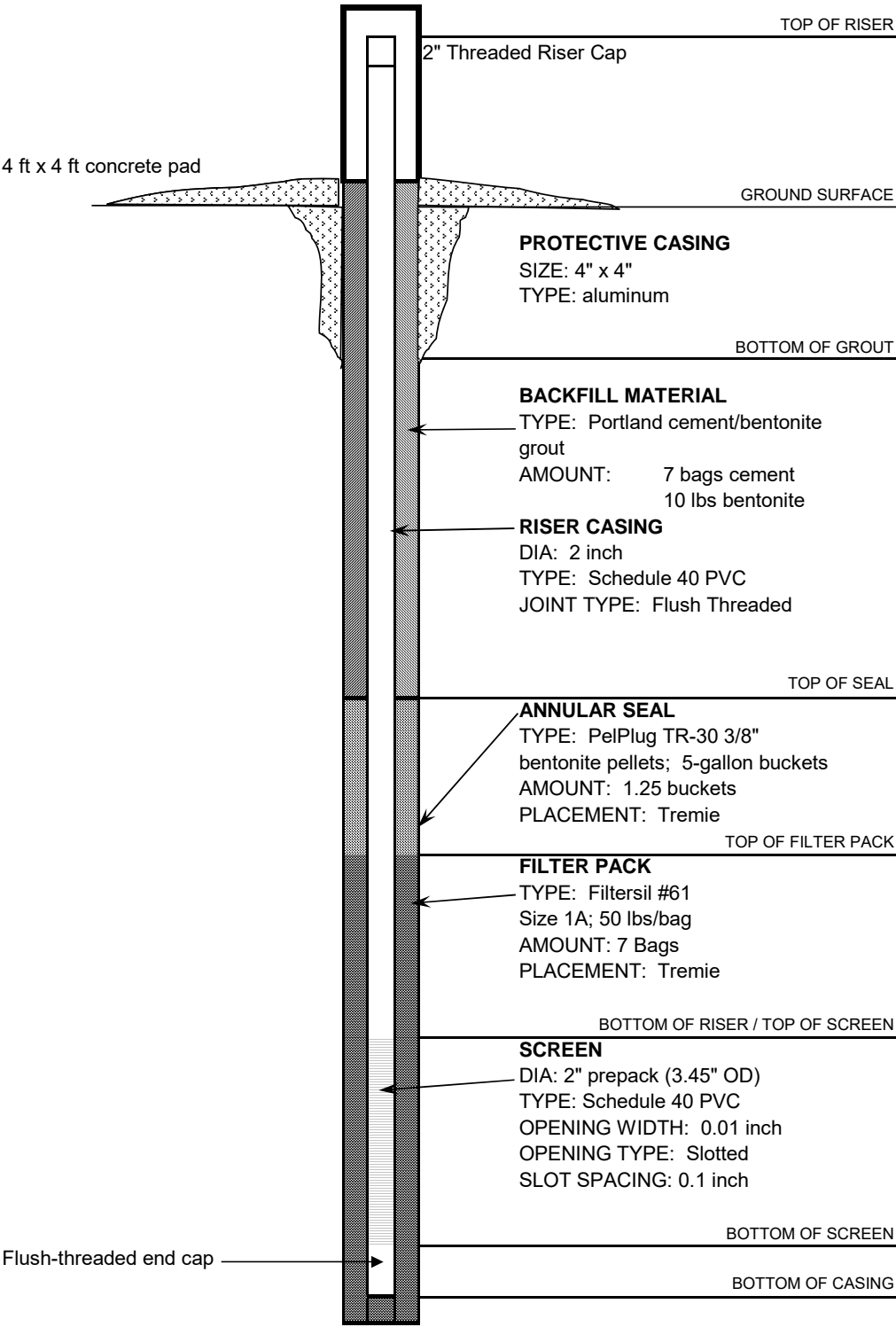
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		<b>Silt (ML)(con't)</b> - light tan, damp, hard, SILT; contains fine to very fine-grained sand and angular quartz gravel		SS -10	54.5	10-17-26 (43)		
60		- light tan, damp, saprolite; contains fine to medium-grained sand	731.4	SS -11	59.5	11-24-50 (74)		
		Bottom of borehole at 61.0 feet.						
65								
70								
75								
80								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS - SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME  B-41		
Hydrogeologic Investigation		DRILLER: S. Denty				
LOCATION: Ash Pond		RIG TYPE: CME550				
LOGGER: Cale Sellers		DRILLING METHODS: HS Auger				
DATE CONSTRUCTED: 11/14/2012		N: 1390920.8 E:2201751.9				
 <p>2" Threaded Riser Cap</p> <p>4 ft x 4 ft concrete pad</p> <p>GROUND SURFACE</p> <p><b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum</p> <p><b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 7 bags cement 10 lbs bentonite</p> <p><b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded</p> <p><b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 3/8" bentonite pellets; 5-gallon buckets AMOUNT: 1.25 buckets PLACEMENT: Tremie</p> <p><b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 7 Bags PLACEMENT: Tremie</p> <p><b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch</p> <p>Flush-threaded end cap</p> <p>HOLE DIA: 7 inch</p>				DEPTH FEET	ELEVATION FT, MSL	
				TOP OF RISER	-2.8	795.20
				GROUND SURFACE	0.0	792.40
				BOTTOM OF GROUT		
				TOP OF SEAL	45.2	747.2
				TOP OF FILTER PACK	47.3	745.1
				BOTTOM OF RISER / TOP OF SCREEN	49.4	743.0
				BOTTOM OF SCREEN	59.4	733.0
				BOTTOM OF CASING	60.0	732.4





# BORING LOG

**BORING B-42**

Page 1 of 2

**SOUTHERN COMPANY SERVICES, INC.**  
**EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**

**PROJECT** Plant McDonough Hydrogeological Investigation

**LOCATION** Cobb County, GA

**DATE STARTED** 11/12/2012 **COMPLETED** 11/12/2012 **GROUND ELEVATION** 802 ft **COORDINATES** N 1391327.8 E 2201870.2

**CONTRACTOR** SCS Field Services **METHOD** 4.25" Hollow Stem Auger w/pilot bit **EQUIPMENT** CME 550

**DRILLED BY** S. Denty **LOGGED BY** C. Sellers **CHECKED BY**  **BORING DEPTH** 51 ft.

**GROUND WATER DEPTH: DURING** 30 ft. **COMP.**  **DELAYED**

**NOTES** Well installed. Refer to well data sheet.

GEOTECH ENGINEERING LOGS - ESEE DATABASE: GDT - 8/26/20 20:44 - \\VALTRCFP01\IAPARKER\DESKTOP\GPCMW LOGS SURVEY UPDATED.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		- Vacuum excavation from 0 ft to 9.5 ft						
5								
10			792.5	SS -1	9.5	1-2-4 (6)		
15		<b>Lean Clay (CL)</b> - orange/tan, medium stiff, silty CLAY; micaceous; fine to very-fine grained						
			787.5	SS -2	14.5	3-4-6 (10)		
20		<b>Silt (ML)</b> - tan/orange/some white, stiff, SILT with very fine sand; very micaceous; saprolite						
				SS -3	19.5	4-4-5 (9)		
25		- SAA		SS	24.5	1-3-4		

(Continued Next Page)





# BORING LOG

BORING B-42

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McDonough Hydrogeological Investigation

LOCATION Cobb County, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		<b>Silt (ML)(con't)</b> - light tan, medium stiff, clayey SILT; very fine-grained; some mica (less than above)		-4		(7)		
30	▽	- tan with black banding, wet, soft, SILT with very fine-grained sand		SS -5	29.5	1-2-2 (4)		
35		- wet, hard, SILT with fine sand and some gravel; angular; saprolite		SS -6	34.5	7-22-26 (48)		
40		- tan, wet, very stiff, SILT with fine sand and angular gravel		SS -7	39.5	8-9-12 (21)		
45		- wet, very stiff, SAA		SS -8	44.5	5-9-14 (23)		
50		<b>Silty Sand (SM)</b> - tan, damp, silty SAND	752.5	SS -9	49.5			
			751.0					
		Bottom of borehole at 51.0 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 8/26/20 20:44 - \\VALTRCFP01\1APARKER\DESKTOP\GPCMW LOGS\_SURVEY UPDATED.GPJ



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS Field Services		WELL NAME
Hydrogeologic Investigation		DRILLER: S. Denty		
LOCATION: Ash Pond		RIG TYPE: CME550		DGWC-42/B-42
LOGGER: Cale Sellers		DRILLING METHODS: HS Auger		
DATE CONSTRUCTED: 11/12/2012		N: 1391327.8 E:2201870.2		
		DEPTH FEET	ELEVATION FT, MSL	
		TOP OF RISER	-2.7	804.68
		2" Threaded Riser Cap		
4 ft x 4 ft concrete pad		GROUND SURFACE	0.0	801.98
		<b>PROTECTIVE CASING</b> SIZE: 4" x 4" TYPE: aluminum		
		BOTTOM OF GROUT		
		<b>BACKFILL MATERIAL</b> TYPE: Portland cement/bentonite grout AMOUNT: 8 bags cement 11 lbs bentonite		
		<b>RISER CASING</b> DIA: 2 inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
		TOP OF SEAL	35.2	766.8
		<b>ANNULAR SEAL</b> TYPE: PelPlug TR-30 1/4" bentonite pellets; 5-gallon buckets AMOUNT: 1 bucket PLACEMENT: Poured		
		TOP OF FILTER PACK	37.2	764.8
		<b>FILTER PACK</b> TYPE: Filtersil #61 Size 1A; 50 lbs/bag AMOUNT: 5 Bags PLACEMENT: Poured w/water		
		BOTTOM OF RISER / TOP OF SCREEN	39.9	762.1
		<b>SCREEN</b> DIA: 2" prepack (3.45" OD) TYPE: Schedule 40 PVC OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.1 inch		
		BOTTOM OF SCREEN	49.9	752.1
Flush-threaded end cap		BOTTOM OF CASING	50.4	751.6
HOLE DIA: 7 inch				



# RECORD OF BOREHOLE DGWC-47/B-47

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 28.80 ft  
LOCATION: Smyrna, GA

DRILL RIG: 100C Track Mounted Rig  
DATE STARTED: 6/23/16  
DATE COMPLETED: 6/23/16

NORTHING: 1,391,553.80  
EASTING: 2,202,610.50  
GS ELEVATION: 794.35  
TOC ELEVATION: 797.45 ft

DEPTH W.L.: 15.98  
ELEVATION W.L.: 778.32  
DATE W.L.: 6/23/2016  
TIME W.L.: 15:56

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 4.00 SILT; red brown, trace subrounded to subangular fine gravel, gray to white, dry (fill)	ML						Portland Type I/ _ Aluminum Casing	<b>WELL CASING</b> Interval: 0'-28.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush threaded with O-ring  <b>WELL SCREEN</b> Interval: 18.4'-28.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 16.35'-28.8' Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 11.3'-16.4' Type: 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0'-11.3' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 4"x4"x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic
790		4.00 - 9.00 SILT; orange brown, some medium sand with black laminations, micaceous, stiff, dry to moist (saprolite)	ML		790.4 4.00				Portland Type I/ Type II/ Bentonite Gel mix	
785		9.00 - 10.00 SILT; gray, some white and black laminations, dry, stiff	ML		785.4 784.4					
10		10.00 - 13.00 SILT and GRAVEL; fine to coarse gravel and cobbles/moderately weathered rock (biotite schist), light brown silt and black with orange staining gravel, foliated, friable	GW-GM		10.00 781.4					
15		13.00 - 20.00 GNEISS and weathered SCHIST; gray and white, foliated biotite gneiss, some orange staining, trace pyrite and garnets (saprock)	PWR		13.00 774.4				3/8" Bentonite - Pellets	
20		20.00 - 28.80 Biotite GNEISS (competent rock); some orange staining at fractures; trace pyrite and garnets	BR		20.00 765.6				Filtersil std #61  0.010" slot screen	
775										
770										
765		Boring completed at 28.80 ft							Sump -	
760										
755										
750										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Bill Lindsey

GA INSPECTOR: K. Jurinko, PG  
CHECKED BY: Rachel P. Kirkman, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE DGWC-48/B-48

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 30.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: 100C Track Mounted Rig  
DATE STARTED: 6/21/16  
DATE COMPLETED: 6/22/16

NORTHING: 1,391,314.60  
EASTING: 2,202,290.20  
GS ELEVATION: 785.21  
TOC ELEVATION: 788.33 ft

DEPTH W.L.: 11.35  
ELEVATION W.L.: 773.85  
DATE W.L.: 6/23/2016  
TIME W.L.: 9:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0	785	0.00 - 3.00 SILT; orange brown, micaceous, dry, very stiff (fill)	ML		782.2 3.00				Portland Type I/ _ Aluminum Casing	<b>WELL CASING</b> Interval: 0'-30' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush threaded with O-ring  <b>WELL SCREEN</b> Interval: 19.6'-29.6' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 17.6'-30' Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 12.1'-17.6' Type: 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0'-12.1' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 4"x4"x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic
5	780	3.00 - 11.00 SILT; oragnish brown to tan, laminations, trace to some medium to coarse sand, trace fine to coarse gravel, gray, subangular, moist (saprolite)	ML						Portland Type I/ Type _ II/ Bentonite Gel mix	
10	775	11.00 - 24.00 SILT; gray to blackish brown, some fine to coarse sand, laminations, stiff to very stiff, dry	ML		774.2 11.00					
15	770		ML						3/8" Bentonite - Pellets	
20	765									
25	760	24.00 - 30.00 biotite GNEISS; gray and white, orange staining, partially weathered bedrock, some clay, gray, micaceous	BR		761.2 24.00				Filtersil std #61	0.010" slot screen  Sump -
30	755	Boring completed at 30.00 ft			755.2					
35	750									
40	745									
45										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Bill Lindsey

GA INSPECTOR: K. Jurinko, PG  
CHECKED BY: Rachel P. Kirkman, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



## SHEET 1 of 1

DEPTH W.L.: 20.8  
ELEVATION W.L.: 788.4  
DATE W.L.: 6/24/2016  
TIME W.L.: 10:50

[illegible]

GA INSPECTOR: K. Jurinko, PG  
CHECKED BY: Rachel P. Kirkman, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-51

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 66.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: 100C Track Mounted Rig  
DATE STARTED: 6/27/16  
DATE COMPLETED: 6/27/16

NORTHING: 1,390,501.20  
EASTING: 2,200,906.50  
GS ELEVATION: 763.29  
TOC ELEVATION: 765.92 ft

DEPTH W.L.: 8.85  
ELEVATION W.L.: 754.45  
DATE W.L.: 6/28/2016  
TIME W.L.: 13:22

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 3.00 SILT; brown, some fine to coarse sand, dry, soft, micaceous (topsoil)	ML		760.3				Portland Type I/ _ Alumimum Casing	<b>WELL CASING</b> Interval: 0'-65' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush threaded with O-ring  <b>WELL SCREEN</b> Interval: 55'-65' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 53'-65.4' Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 47.5'-53' Type: 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 3'-47.5' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic
760		3.00 - 15.00 SILT; red to reddish brown, some fine to coarse gravel, black, subrounded, some clayey silt, orangish white and balck, dry, soft, micaceous (saprolite)	ML		3.00					
5										
755										
10										
750										
15		15.00 - 58.00 SILT and SAND; orangish brown, brown, and grey, fine to medium sand, some laminations and black mottling, micaceous, some biotite schist gravel, fine to coarse, dry to wet, very soft to very stiff			748.3				Portland Type I/ Type _ II/ Bentonite Gel mix	
745					15.00					
20										
740										
25										
735										
30			SP-SM							
730										
35										
725										
40										
720										
45										

Log continued on next page

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Scotty Vermillion

GA INSPECTOR: K. Jurinko, PG  
CHECKED BY: Rachel P. Kirkman, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-51

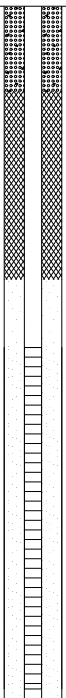
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 66.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: 100C Track Mounted Rig  
DATE STARTED: 6/27/16  
DATE COMPLETED: 6/27/16

NORTHING: 1,390,501.20  
EASTING: 2,200,906.50  
GS ELEVATION: 763.29  
TOC ELEVATION: 765.92 ft

DEPTH W.L.: 8.85  
ELEVATION W.L.: 754.45  
DATE W.L.: 6/28/2016  
TIME W.L.: 13:22

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
45		15.00 - 58.00 SILT and SAND; orangish brown, brown, and grey, fine to medium sand, some laminations and black mottling, micaceous, some biotite schist gravel, fine to coarse, dry to wet, very soft to very stiff (Continued)	SP-SM						 <p>3/8" Bentonite Pellets</p> <p>Filtersil std #61</p> <p>0.010" slot screen</p> <p>Sump</p>	<p><b>WELL CASING</b> Interval: 0'-65' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush threaded with O-ring</p> <p><b>WELL SCREEN</b> Interval: 55'-65' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p><b>FILTER PACK</b> Interval: 53'-65.4' Type: Filtersil std61</p> <p><b>FILTER PACK SEAL</b> Interval: 47.5'-53' Type: 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 3'-47.5' Type: Portland Type I/Type II/Gel Mix</p> <p><b>WELL COMPLETION</b> Pad: 4"x4"x4" Protective Casing: Aluminum</p> <p><b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic</p>
715										
50										
710										
55										
705		58.00 - 66.00 biotite SCHIST; some clayey silt and sand to gravel, coarse-grained, gray, orange staining, micaceous, dry to wet, very stiff (saprock)	PWR		705.3 58.00					
60										
700										
65										
		Boring completed at 66.00 ft			697.3					
695										
70										
690										
75										
685										
80										
680										
85										
675										
90										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Scotty Vermillion

GA INSPECTOR: K. Jurinko, PG  
CHECKED BY: Rachel P. Kirkman, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-52

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: Northside of the Lab Parking lot

DRILL RIG: CME 55  
DATE STARTED: 9/27/16  
DATE COMPLETED: 9/28/16

NORTHING: 1,392,308.30  
EASTING: 2,201,314.80  
GS ELEVATION: 820.18  
TOC ELEVATION: 822.89 ft

DEPTH W.L.: 25.72  
ELEVATION W.L.: 794.58  
DATE W.L.: 10/6/2016  
TIME W.L.: 1330

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0	820	0.00 - 10.00 Top 10' were Hydrovac for utilities.									CETCO puregold grout (70:30) – / aluminum casing	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>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Log continued on next page

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: Shawn Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-52

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: Northside of the Lab Parking lot

DRILL RIG: CME 55  
DATE STARTED: 9/27/16  
DATE COMPLETED: 9/28/16

NORTHING: 1,392,308.30  
EASTING: 2,201,314.80  
GS ELEVATION: 820.18  
TOC ELEVATION: 822.89 ft

DEPTH W.L.: 25.72  
ELEVATION W.L.: 794.58  
DATE W.L.: 10/6/2016  
TIME W.L.: 1330

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45	775	33.50 - 50.00 SM, silty SAND, fine to coarse, non to moderate plasticity, trace rock fragments, yellow-orange, non-cohesive, dry to moist, W<PL, compact to very dense, PWR (Continued)	SM								0.010 Slotted Screen	<b>WELL CASING</b> Interval: 0'-38.9' Material: Schedule 40 PVC Diameter: 2 Joint Type: FLUSH/SCREW  <b>WELL SCREEN</b> Interval: 38.9'-48.9' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 35.7'-50' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 31.0-35.7 Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0-31' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
50	770	Boring completed at 50.00 ft			770.2	8	DO	50/3	50/3	0.25 0.25		
55	765											
60	760											
65	755											
70	750											
75	745											
80	740											
85	735											
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: Shawn Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17





# RECORD OF BOREHOLE DGWA-53/B-53

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 28.90 ft  
LOCATION: in the middle of the pond of the construction area of AP3

DRILL RIG: CME 55  
DATE STARTED: 9/24/16  
DATE COMPLETED: 9/24/16

NORTHING: 1,393,472.80  
EASTING: 2,201,668.80  
GS ELEVATION: 841.37  
TOC ELEVATION: 844.26 ft

DEPTH W.L.: 10.08  
ELEVATION W.L.: 831.22  
DATE W.L.: 10/6/2016  
TIME W.L.: 1233

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0	840	0.00 - 3.50 SM, silt SAND, fine to medium grained, non-plastic, tan, non-cohesive, dry to moist, compact	SM			1	DO	2-4-6	10	1.50	CETCO puregold grout (70:30) — / aluminum casing	<b>WELL CASING</b> Interval: 0'-17.6' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 17.6'-27.6' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 12'-28.9' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 8'-12' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-8' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell
5	835	3.50 - 12.20 SM, silt SAND, fine to medium grained, non-plastic, tan, non-cohesive, dry to moist, compact to dense (saprolite). Auger Refusal at 12.2	SM		837.9 3.50	2	DO	4-6-6	12	1.50	CETCO puregold grout (70:30)	
10	830					3	DO	5-13-35	48	1.50	PEL-PLUG 3/8" Bentonite pellets	
15	825	12.20 - 29.50 Bedrock; GNEISS; competent, thinly foliated.	BR		829.2 12.20						FilterSil —	
20	820										0.010" slotted — screen	
25	815											
30	810	Boring completed at 28.90 ft			812.5 28.9							
35	805											
40	800											
45												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Nortey Yeboah  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-54




SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 34.20 ft  
LOCATION: Eastside of the stream north of AP4

DRILL RIG: CME 55  
DATE STARTED: 9/26/16  
DATE COMPLETED: 9/26/16

NORTHING: 1,394,423.50  
EASTING: 2,203,140.70  
GS ELEVATION: 782.54  
TOC ELEVATION: 785.46 ft

DEPTH W.L.: 4.56  
ELEVATION W.L.: 778.04  
DATE W.L.: 10/6/2016  
TIME W.L.: 839

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC	
					DEPTH (ft)								
0		0.00 - 13.50 Top 10' were Hydrovac for utilities.									Portland Type I/Type II/Gel Mix / — aluminum casing	<div><div>WELL CASING Interval: 0'-23.8' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw</div><div>WELL SCREEN Interval: 23.8'-33.8' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC</div><div>FILTER PACK Interval: 21.9'-34.2' Type: FilterSil</div><div>FILTER PACK SEAL Interval: 17.8'-21.9' Type: PEL-PLUG 3/8" Bentonite pellets</div><div>ANNULUS SEAL Interval: 0-17.8' Type: Portland Type I/Type II/Gel Mix</div><div>WELL COMPLETION Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum</div><div>DRILLING METHODS Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell</div></div>	
780													
5											Portland Type I/Type — II/Gel Mix		
775													
10											PEL-PLUG 3/8" — Bentonite pellets		
770													
15		13.50 - 28.50 SM, silty SAND, fine to coarse, non to low plasticity; white to gray, weathered, well foliated gneiss saprolite; cohesive, moist, w<PL, stiff.	SM		769.0	1	DO	6-7-6	13	0.83 1.50	FilterSil —		
765													
20							2	DO	5-9-8	17			1.33 1.50
760													
25							3	DO	4-5-11	15			0.00 1.50
755													
30		28.50 - 29.00 GPS, poorly-graded sandy GRAVEL, fine to coarse, non plastic, some silt; white to tan to pink, K-spar and Quartz; non-cohesive, wet, w<PL, dense., PWR. Auger Refusal at 29.0 29.00 - 34.20 Bedrock; AUGEN GNEISS; fresh to slightly weathered, well foliated, gray, fine grained, medium strong to strong, (locally contains pegamitite zones). Boring completed at 34.20 ft	GP-GM		754.0 753.5 29.00	4	DO	21-50/1	71/7	0.50 0.58	0.010 Slotted — Screen		
750			BR		748.3								
35													
745													
40													
740													
45													

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Terracon  
DRILLER: Shep Becker

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-55

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 52.00 ft  
LOCATION: West of the cement plant

DRILL RIG: CME 55  
DATE STARTED: 9/21/16  
DATE COMPLETED: 9/22/16

NORTHING: 1,394,142.60  
EASTING: 2,204,147.90  
GS ELEVATION: 822.86  
TOC ELEVATION: 825.12 ft

DEPTH W.L.: 12.05'  
ELEVATION W.L.: 810.85  
DATE W.L.: 10/6/2016  
TIME W.L.: 850

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 3.50 SM, silty SAND, non to low plasticity; red-brown; cohesive, moist, w<PL, soft.	SM			1	DO	4-8-11	19	0.75 1.50	Portland Type I/Type II/Gel Mix / -- aluminum casing	<b>WELL CASING</b> Interval: 0'-41' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 41' - 51' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 39'-52' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 32'-39' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-32' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
820					819.4							
5		3.50 - 13.50 ML, SILT, trace to some sand and clay, non to low plasticity; light brown to red-brown to silverish gray; cohesive, dry to moist, w<PL, soft to firm.	ML		3.50	2	DO	7-7-9	16	1.00 1.50		
815						3	DO	7-11-12	23	1.33 1.50		
10						4	DO	5-8-11	19	1.50 1.50	Portland Type I/Type -- II/Gel Mix	
810					809.4							
15		13.50 - 23.50 ML, SILT, trace fine to coarse sand, non plastic; light brown, deeply weathered, foliated, schist saprolite, cohesive, dry to moist, w<PL, soft to firm.	ML		13.50	5	DO	8-17-24	41	1.50 1.50		
805						6	DO	9-10-11	21	1.50 1.50		
20											PEL-PLUG 3/8" -- Bentonite pellets	
800					799.4							
25		23.50 - 52.00 ML, SILT, some sand, non plastic; light brown to tan to silverish gray, schist saprolite; cohesive, moist to wet (increases with depth), w<PL, soft to firm.	ML		23.50	7	DO	5-12-12	24	1.50 1.50		
795						8	DO	8-12-15	27	1.50 1.50		
30											FilterSil --	
790						9	DO	9-14-17	31	1.50 1.50		
785						10	DO	10-12-16	28	1.50 1.50		
40						11	DO	7-12-23	35	1.50 1.50		
780												
45												

Log continued on next page

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Terracon  
DRILLER: Shep Becker

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-55

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 52.00 ft  
LOCATION: West of the cement plant

DRILL RIG: CME 55  
DATE STARTED: 9/21/16  
DATE COMPLETED: 9/22/16

NORTHING: 1,394,142.60  
EASTING: 2,204,147.90  
GS ELEVATION: 822.86 TOC  
ELEVATION: 825.12 ft

DEPTH W.L.: 12.05'  
ELEVATION W.L.: 810.85  
DATE W.L.: 10/6/2016  
TIME W.L.: 850

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		23.50 - 52.00 ML, SILT, some sand, non plastic; light brown to tan to silverish gray, schist saprolite; cohesive, moist to wet (increases with depth), w<PL, soft to firm. (Continued)	ML								0.010 Slotted _ Screen	<b>WELL CASING</b> Interval: 0' - 41' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 41' - 51' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 39'-52' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 32'-39' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-32' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
775												
50												
		Boring completed at 52.00 ft			770.9							
770												
55												
765												
60												
760												
65												
755												
70												
750												
75												
745												
80												
740												
85												
735												
90												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Terracon  
DRILLER: Shep Becker

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-56

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 45.00 ft  
LOCATION: SW of the cement plant

DRILL RIG: CME 55  
DATE STARTED: 10/3/16  
DATE COMPLETED: 10/3/16

NORTHING: 1,393,957.90  
EASTING: 2,204,187.80  
GS ELEVATION: 820.95  
TOC ELEVATION: 823.59 ft

DEPTH W.L.: 16.39  
ELEVATION W.L.: 804.61  
DATE W.L.: 10/6/2016  
TIME W.L.: 900

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS				
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC			
					DEPTH (ft)										
0	820	0.00 - 13.50 ML, SILT, trace fine sand, non to low plasticity; brownish red, micaceous, fill; cohesive, dry to moist, w<PL, firm.	ML								CETCO puregold grout (70:30) – / aluminum casing		<b>WELL CASING</b> Interval: 0'-34.6' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 34.6'-44.6' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 31.8' - 45' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 26.7'-31.8' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-26.7' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A		
						1	DO	2-5-5	10	1.08 1.50					
5	815														
						2	DO	2-4-4	8	0.75 1.50					
10	810														
										CETCO puregold grout (70:30)					
		13.50 - 23.50 ML, SILT, trace fine to coarse sand, non to low plasticity; red to brown to black to silver, micaceous, schist/schistose gneiss saprolite; cohesive, mosit to wet, soft to stiff.	ML			3	DO	3-5-11	16	1.50 1.50					
15	805														
						4	DO	3-5-9	16	1.50 1.50					
20	800														
		23.50 - 45.00 ML, SILT, trace fine to coarse sand, non to low plasticity; brown to silvery brown, deeply weathered, micaceous, schist saprolite; cohesive, wet, w<PL, soft to firm. (locally contains pegmatite veins)	ML			5	DO	7-8-14	22	1.33 1.50					
25	795														
						6	DO	7-6-12	18	1.33 1.50					
30	790														
	</														

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-57

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.50 ft  
LOCATION: North of the 4-wide construction trailer

DRILL RIG: CME 55  
DATE STARTED: 9/24/16  
DATE COMPLETED: 9/24/16

NORTHING: 1,391,396.30  
EASTING: 2,202,736.90  
GS ELEVATION: 786.03  
TOC ELEVATION: 789.04 ft

DEPTH W.L.: 21.49  
ELEVATION W.L.: 764.51  
DATE W.L.: 10/6/2016  
TIME W.L.: 920

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0	785	0.00 - 10.00 Boring was hydrovac'd to 10' bgs (material appears to be SM-ML)	SM-ML		776 10.00						Portland Type I/Type II/Gel Mix / -- aluminum casing	<b>WELL CASING</b> Interval: 0'-40' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 40'-50' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 34.6'-50.5' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 29'-34.6' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-29' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell
5	780											
10	775	10.00 - 30.00 ML- Sandy Clayey SILT, fine to coarse sand, some fine gravel; reddish-brown to brown, dense, dry; micaceous, PWR										
15	770		ML		756 30.00	1	DO	4-10-14	24	1.00 1.50	Portland Type I/Type II/Gel Mix	
20	765											
25	760					2	DO	11-24-50/5	74/11	1.00 1.50		
30	755	30.00 - 34.50 CL- Silty CLAY, SOME fine to medium SAND, trace gravel: brown; loose, W<PL; micaceous, PWR. Auger Refusal at 34.5										
35	750	34.50 - 50.50 Bedrock; SCHIST; strong to very strong, light to dark gray with white and black laminations, sub-parallel; slightly weathered top with red oxidation on fractured surfaces to fresh and unfractured at the bottom.	BR		751.5 34.50	3	DO	4-8-14	22	1.33 1.50	PEL-PLUG 3/8" -- Bentonite pellets	
40	745					4	DO	4-4-8	12	1.33 1.50		
45						5	DO	50/3	50/3	0.00 0.25	FilterSil --  0.010 Slotted Screen	

Log continued on next page

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Terracon  
DRILLER: Shep Becker

GA INSPECTOR: Aubrey Ellis  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-57


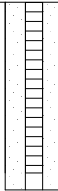
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.50 ft  
LOCATION: North of the 4-wide construction trailer

DRILL RIG: CME 55  
DATE STARTED: 9/24/16  
DATE COMPLETED: 9/24/16

NORTHING: 1,391,396.30  
EASTING: 2,202,736.90  
GS ELEVATION: 786.03  
TOC ELEVATION: 789.04 ft

DEPTH W.L.: 21.49  
ELEVATION W.L.: 764.51  
DATE W.L.: 10/6/2016  
TIME W.L.: 920

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in  140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
45	740	34.50 - 50.50 Bedrock; SCHIST; strong to very strong, light to dark gray with white and black laminations, sub-parallel; sightly weathered top with red oxidation on fractured surfaces to fresh and unfractured at the bottom. <i>(Continued)</i>	BR								<b>WELL CASING</b> Interval: 0'-40' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 40'-50' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 34.6'-50.5' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 29'-34.6' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-29' Type: Portland Type I/Type II/Gel Mix  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell	
50	735	Boring completed at 50.50 ft				735.5						
55	730											
60	725											
65	720											
70	715											
75	710											
80	705											
85	700											
90												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Terracon  
DRILLER: Shep Becker

GA INSPECTOR: Aubrey Ellis  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-58

SHEET 1 of 2






PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 45.00 ft  
LOCATION: SW corner of the new overflow parking lot of the NEW admin building

DRILL RIG: CME 55  
DATE STARTED: 9/22/16  
DATE COMPLETED: 9/23/16

NORTHING: 1,391,125.70  
EASTING: 2,202,426.50  
GS ELEVATION: 785.20  
TOC ELEVATION: 788.17 ft

DEPTH W.L.: 22.30  
ELEVATION W.L.: 762.9  
DATE W.L.: 10/6/2016  
TIME W.L.: 940

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC	
					DEPTH (ft)								
0	785	0.00 - 13.50 Top 10' were Hydrovac for utilities.										CETCO puregold grout (70:30) – / aluminum casing	<b>WELL CASING</b> Interval: 0'- 34.5' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 34.5'-44.5' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 31.7'-45.' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 24.1'-31.7' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-24.1' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
5	780												
10	775												
15	770	13.50 - 18.50 SC-SM, silty SAND/ clayly SAND, fine to coarse, low plasticity; red to red orang, fill; cohesive, moist, w<PL, soft to firm.	SC-SM		771.7 13.50	1	DO	5-6-7	13	1.50 1.50			
20	765	18.50 - 23.50 ML, SILT, trace sand, low to moderate plasticity; red orange, micaceous, fill; cohesive, moist, w<PL, soft to firm.	ML		766.7 18.50	2	DO	2-1-2	3	1.50 1.50		CETCO puregold – grout (70:30)	
25	760	23.50 - 28.50 ML, SILT, some fine sand, low plasticity; tan to white; cohesive, wet, w<PL (over saturated), soft.	ML		761.7 23.50	3	DO	2-3-3	6	1.50 1.50			
30	755	28.50 - 33.50 ML, SILT, non plastic; brown to silver, slight to deeply weathered, schistose gneiss saprolite; cohesive, wet, w<PL, firm to stiff.	ML		756.7 28.50	4	DO	4-7-9	16	1.50 1.50		PEL-PLUG 3/8" – Bentonite pellets	
35	750	33.50 - 45.00 ML, SILT, trace to some sand, low to moderate plasticity; brown to dark brown, micaceous, schistose gneiss/shcist saprolite; cohesive, moist to wet, w<PL, soft to stiff.	ML		751.7 33.50	5	DO	1-4-7	11	1.50 1.50		FilterSil –	
40	745					6	DO	3-6-11	17	1.50 1.50		0.010 Slotted Screen –	
45						7	DO	3-7-12	19	1.50 1.50			
		Boring continued on next page			740.2								

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17





# RECORD OF BOREHOLE B-58

SHEET 2 of 2

PROJECT: Plant McDonough  
 PROJECT NUMBER: 1668496.18  
 DRILLED DEPTH: 45.00 ft  
 LOCATION: SW corner of the new overflow parking lot of the NEW admin building

DRILL RIG: CME 55  
 DATE STARTED: 9/22/16  
 DATE COMPLETED: 9/23/16

NORTHING: 1,391,125.70  
 EASTING: 2,202,426.50  
 GS ELEVATION: 785.20  
 TOC ELEVATION: 788.17 ft

DEPTH W.L.: 22.30  
 ELEVATION W.L.: 762.9  
 DATE W.L.: 10/6/2016  
 TIME W.L.: 940

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45	740											<b>WELL CASING</b> Interval: 0'-34.5' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 34.5'-44.5' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 31.7'-45.' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 24.1'-31.7' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-24.1' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
50	735											
55	730											
60	725											
65	720											
70	715											
75	710											
80	705											
85	700											
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
 DRILLING COMPANY: Southern Company Services  
 DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
 CHECKED BY: Timothy Richards, PG  
 DATE: 12/22/17





# RECORD OF BOREHOLE B-59

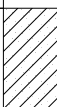




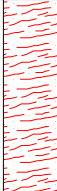
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 30.25 ft  
LOCATION: westside of the stream north of AP4

DRILL RIG: CME 55  
DATE STARTED: 9/23/16  
DATE COMPLETED: 9/23/16

NORTHING: 1,394,349.10  
EASTING: 2,203,001.10  
GS ELEVATION: 785.41  
TOC ELEVATION: 788.00 ft

DEPTH W.L.: 5.56  
ELEVATION W.L.: 779.94  
DATE W.L.: 10/6/2016  
TIME W.L.: 828

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
					DEPTH (ft)							
0	785	0.00 - 3.50 SC, clayly SAND, fine to coarse, non plastic; red, micaceous, fill; cohesive, dry, w<PL, stiff.	SC			1	DO	3-5-7	12	1.16 1.50	CETCO puregold grout (70:30) – / aluminum casing	<b>WELL CASING</b> Interval: 0'-20.2' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw
					781.9 3.50	2	DO	2-1-1	2	0.75 1.50		
5	780	3.50 - 9.00 CH, CLAY, moderate to high plasticity; aark brown to red brown, fill; cohesive, moist, w>PL, soft.	CH									<b>FILTER PACK</b> Interval: 17'-30.2' Type: FilterSil
					776.4 9.00	3	DO	WOH-1-1	2	1.50 1.50		
10	775	9.00 - 14.00 SM, SAND and SILT, fine, trace organics, non to low plasticity; gray; cohesive, wet, w<PL, very soft.	SM									<b>ANNULUS SEAL</b> Interval: 0'-12' Type: CETCO puregold grout (70:30)
					771.4 14.00	4	DO	4-5-7	12	1.50 1.50		
15	770	14.00 - 19.00 SP-SW, moderate- graded SAND, fine to coarse, non plastic; tan to white; non-cohesive, wet, w<PL, loose.	SP-SW									<b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell
					766.4 19.00	5	DO	5-4-5	9	1.00 1.50		
20	765	19.00 - 24.50 SM, silty SAND, low plasticity; gray to black, deeply weathered, gneissic saprolite; cohesive, moist to wet, w<PL, firm to very stiff, PWR. Auger Refusal at 24.3	SM									
					760.9 24.50	6	DO	50/4	50/4	0.66 0.33		
25	760	24.50 - 30.25 Bedrock; AUGEN GNEISS; slightly weathered, foliated, gray to dark gray, fine to medium grained, medium strong.	BR									
30	755	Boring completed at 30.25 ft										
35	750											
40	745											
45												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17









# RECORD OF BOREHOLE B-60

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 49.80 ft  
LOCATION: Almost due south of B-58 ~ 300 to 400 feet

DRILL RIG: CME 55  
DATE STARTED: 9/29/16  
DATE COMPLETED: 9/29/16

NORTHING: 1,391,100.70  
EASTING: 2,202,881.60  
GS ELEVATION: 779.25  
TOC ELEVATION: 782.13 ft

DEPTH W.L.: 33.35  
ELEVATION W.L.: 745.85  
DATE W.L.: 10/6/2016  
TIME W.L.: 955

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		33.50 - 48.50 SM, silty SAND; brown to red brown, saprolite; non-cohesive, moist to wet (increases with depth), dense, PWR. (Continued)	SM								0.010 Slotted Screen	<b>WELL CASING</b> Interval: 0'-39.3' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 39.3' - 49.3' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 36.9'-50' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 30.2'-36.9' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-30.2' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
730		48.50 - 49.80 SM, silty SAND; gray to brown, saprolite, contains mica; non-cohesive, moist to wet (increases with depth), dense, PWR Boring completed at 49.80 ft	SM		730.8 48.50 729.5	8	DO	50/3	50/3	0.16 0.25		
50												
725												
55												
720												
60												
715												
65												
710												
70												
705												
75												
700												
80												
695												
85												
690												
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Nortey Yeboah  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17





## SHEET 1 of 2

DEPTH W.L.: 22.25  
ELEVATION W.L.: 756.75  
DATE W.L.: 10/6/2016  
TIME W.L.: 950

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-61

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 52.40 ft  
LOCATION: SSW of B-57. on the NE corner of the switch yard

DRILL RIG: CME 55  
DATE STARTED: 9/28/16  
DATE COMPLETED: 9/29/16

NORTHING: 1,390,957.80  
EASTING: 2,202,505.80  
GS ELEVATION: 778.95  
TOC ELEVATION: 782.09 ft

DEPTH W.L.: 22.25  
ELEVATION W.L.: 756.75  
DATE W.L.: 10/6/2016  
TIME W.L.: 950

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		38.50 - 52.40 SM, silty SAND, fine to coarse, non to low plasticity; dark brown to gray to black, deeply weathered, schistose gneiss / schist saprolite; non-cohesive to cohesive, moist, w<PL, compact to dense / firm to stiff, PWR. (Continued)	SM								0.010 Slotted _ Screen	<b>WELL CASING</b> Interval: 0'-41.5' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 41.5'-51.5' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 39.5'-51.9' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 35'-39.5' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-35' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 4"x4"x5' aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
730						8	DO	14-9-14	23	1.50 1.50		
50												
		Boring completed at 52.40 ft			726.6							
725												
55												
720												
60												
715												
65												
710												
70												
705												
75												
700												
80												
695												
85												
690												
90												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-62





SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 39.90 ft  
LOCATION: South of the Main road.

DRILL RIG: CME 55  
DATE STARTED: 10/4/16  
DATE COMPLETED: 10/4/16

NORTHING: 1,389,828.10  
EASTING: 2,201,811.20  
GS ELEVATION: 760.40  
TOC ELEVATION: 760.08 ft

DEPTH W.L.: 21.57  
ELEVATION W.L.: 738.83  
DATE W.L.: 10/6/2016  
TIME W.L.: 1000

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0	760	0.00 - 13.50 Top 10' were Hydrovac for utilities.									CETCO puregold grout (70:30) — / aluminum casing	<b>WELL CASING</b> Interval: 0'-30' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 29.7'-39.7' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 25.5'-40.1' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 19.6'-25.5' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-19.6' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell
5	755											
10	750											
15	745	13.50 - 18.50 SM, silty SAND, fine, low to moderate plasticity; red-brown; cohesive, wet, w~PL, very soft to soft.	SM		746.9 13.50	1	DO	3-1-3	4	1.00 1.50	CETCO puregold — grout (70:30)	
20	740	18.50 - 23.50 CL, CLAY, trace silt and fine sand, moderate plasticity; red-brown; cohesive, moist to wet, w~PL, soft to firm.	CL		741.9 18.50	2	DO	1-1-1	2	1.50 1.50		
25	735	23.50 - 24.60 SP, poorly-graded SAND, fine to coarse, non plastic; gray to black; non-cohesive, wet, w<PL, very dense, PWR. Auger Refusal at 24.2  24.60 - 39.90 Bedrock; SCHIST fresh to slightly weathered, foliated, dark green to black, fine to medium grained.	SP		736.9 23.50 735.8 24.60	3	DO	50/4	50/4	0.16 0.33	PEL-PLUG 3/8" — Bentonite pellets	
30	730		BR								FilterSil —	
35	725											
40	720	Boring completed at 39.90 ft					720.5					
45												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17





# RECORD OF BOREHOLE B-63

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 46.00 ft  
LOCATION: Due south of B-61. Flush mounted in the roadway.

DRILL RIG: CME 55  
DATE STARTED: 10/6/16  
DATE COMPLETED: 10/6/16

NORTHING: 1,390,999.10  
EASTING: 2,202,978.10  
GS ELEVATION: 777.37  
TOC ELEVATION: 777.10 ft

DEPTH W.L.: 34.2  
ELEVATION W.L.: 743.1  
DATE W.L.: 10/6/2016  
TIME W.L.: 1745

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0		0.00 - 13.50 Top 12' were Hydrovac for utilities.									CETCO puregold grout (70:30) – / aluminum casing	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>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LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-63

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 46.00 ft  
LOCATION: Due south of B-61. Flush mounted in the roadway.

DRILL RIG: CME 55  
DATE STARTED: 10/6/16  
DATE COMPLETED: 10/6/16

NORTHING: 1,390,999.10  
EASTING: 2,202,978.10  
GS ELEVATION: 777.37  
TOC ELEVATION: 777.10 ft

DEPTH W.L.: 34.2  
ELEVATION W.L.: 743.1  
DATE W.L.: 10/6/2016  
TIME W.L.: 1745

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		Boring completed at 46.00 ft	SM		731.4							<b>WELL CASING</b> Interval: 0' - 35.5' Material: Schedule 40 PVC Diameter: 2 Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 35.5'-45.5' Material: Schedule 40 PVC Diameter: 2 Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 33'- 45.9' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 27.6'-33' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0' - 27.6' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
730												
50												
725												
55												
720												
60												
715												
65												
710												
70												
705												
75												
700												
80												
695												
85												
690												
90												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 12/22/17



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20





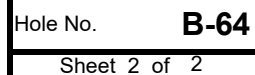
# **DRILLING LOG** **GEOLOGICAL SERVICES**

Hole No. **B-64**  
Sheet 1 of 2

SITE <b>Plant McDonough</b>		HOLE DEPTH <b>31'</b>	SURFELEV <b>786.10</b>
LOCATION <b>North of AP-4, near property line at Atkinson Rd</b>		COORDINATES <b>33.832856</b>	<b>-84.474746</b>
ANGLE _____	BEARING _____	CONTRACTOR <b>SCS</b>	DRILL NO. _____
DRILLING METHOD <b>HSA</b>		NO. SAMPLES _____	NO. U.D. SAMPLES <b>0</b>
CASING SIZE <b>2"</b>	LENGTH <b>10'</b>	CORE SIZE _____	TOTAL % REC. _____
WATER TABLE DEPTH <b>4.9' BLS</b>	ELEV. <b>781.20' NAVD88</b>	TIME AFTER COMP. <b>24 hr</b>	DATE TAKEN <b>11/3/2016</b>
TYPE GROUT <b>Bentonite</b>	QUANTITY _____	MIX _____	DRILLING START DATE <b>11/2/2016</b>
DRILLER <b>Milam</b>	RECORDER <b>Abraham</b>	APPROVED _____	DRILLING COMP. DATE <b>11/2/2016</b>

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test			Comments	% Rec	RQD
				From To	Blows	N			
0	786.10								
1	785.10								
2	784.10								
3	783.10								
4	782.10								
5	781.10	<b>HYDRO-EXCAVATION</b> Hydrovac from land surface to 20-feet below land. No samples							
6	780.10								
7	779.10								
8	778.10								
9	777.10								
10	776.10								
11	775.10								
12	774.10								
13	773.10								
14	772.10								
15	771.10								
16	770.10								
17	769.10								
18	768.10								
19	767.10								
20	766.10								
21	765.10								
22	764.10	<b>SANDY SILT SAPROLITE</b> Light gray sandy silt saprolite; minor quartz & feldspar grains, micaceous; oxidation along relict foliations; Fe stains; 2.5Y/6/1; SM.	S-1	23.5 - 25	1-1-2			85	
23	763.10								
24	762.10								





SITE	Plant McDonough	TOTAL DEPTH	31'	SURF.ELEV.	786.10
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[illegible]



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS, Inc.		WELL NAME	
North of AP-4, at Atkinson Rd		DRILLER: Milam			
LOCATION: 33.832856 / -84.474746		RIG TYPE: CME550			
LOGGER: Abraham		DRILLING METHODS: HSA		B-64	
DATE CONSTRUCTED: 11/2/2016		Survey Coordinates: N: 1394381.9 E: 2203031.3			
				DEPTH	ELEVATION
				FEET	FT, MSL
				TOC	785.83
4 ft x 4 ft x 4" concrete pad				GROUND SURFACE	0.0
					785.98
<b>PROTECTIVE CASING</b> Flushmounted					
				BOTTOM OF GROUT	3.0
					783.0
<b>BACKFILL MATERIAL</b> TYPE: Bentonite Grout mix AMOUNT: 1 x 50lbs					
<b>RISER CASING</b> DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded					
				TOP OF SEAL	8.10
					777.9
<b>ANNULAR SEAL</b> TYPE: 1/4" coated bentonite pellets 5-gal buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie					
				TOP OF FILTER PACK	16.50
					769.5
<b>FILTER PACK</b> TYPE: DSI Sand - 1A (20/40) Drillers Services, Inc. AMOUNT: 6 Bags PLACEMENT: Tremie; wash with water					
				BOTTOM OF RISER / TOP OF SCREEN	20.00
					766.0
<b>SCREEN</b> DIA: 2" TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.25 inch SLOT LENGTH: 1.5 inch					
				BOTTOM OF SCREEN	30.00
					756.0
				BOTTOM OF WELL	30.40
					755.6
HOLE DIA: 9 inch					



**DRILLING LOG**  
**GEOLOGICAL SERVICES**

Hole No. **B-65**  
Sheet 1 of 2

SITE **Plant McDonough** HOLE DEPTH **50'** SURFELEV **822.30**  
LOCATION **North of AP-4, near property line, NW end of parking lot** COORDINATES **33.832862** **-84.471389**  
ANGLE \_\_\_\_\_ BEARING \_\_\_\_\_ CONTRACTOR **SCS** DRILL NO. \_\_\_\_\_  
DRILLING METHOD **HSA** NO. SAMPLES \_\_\_\_\_ NO. U.D. SAMPLES **0**  
CASING SIZE **2"** LENGTH **10'** CORE SIZE \_\_\_\_\_ TOTAL % REC. \_\_\_\_\_  
WATER TABLE DEPTH **10.5' BLS** ELEV. **811.80 NAVD88** TIME AFTER COMP. **24 HR** DATE TAKEN **11/16/2016**  
TYPE GROUT \_\_\_\_\_ QUANTITY \_\_\_\_\_ MIX \_\_\_\_\_ DRILLING START DATE **11/15/2016**  
DRILLER **Milam** RECORDER **Abraham** APPROVED \_\_\_\_\_ DRILLING COMP. DATE **11/15/2016**

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test			Comments	% Rec	RQD
				From To	Blows	N			
0	822.30								
1	821.30								
2	820.30								
3	819.30								
4	818.30								
5	817.30	<b>HYDRO-EXCAVATION</b>							
6	816.30	Hydrovac from land surface to 10-feet below land. No samples							
7	815.30								
8	814.30								
9	813.30								
10	812.30								
11	811.30								
12	810.30								
13	809.30								
14	808.30	<b>SILTY SAND SAPROLITE</b>							
15	807.30	Light brown silty sand with minor clay; weathered schist fragments; minor oxidation bands; minor quartz fragments	S-1	13.5-15	13-50/3			90	
16	806.30	10YR/3/2; SM; At 15-ft, large rock fragments brownish black color; damp.							
17	805.30								
18	804.30								
19	803.30	<b>SILTY SAND SAPROLITE</b>							
20	802.30	Blackish brown silty sand saprolite; large micas with a greenish tinge; highly oxidized with FeO parallel to foliations; 10YR/3/2; SM; damp to moist.	S-2	18.5-20	24-30-31	61		90	
21	801.30								
22	800.30	<b>CLAYEY SILT</b>							
23	799.30	Dark gray to reddish brown silty sand saprolite; micas abundant; softer than interval above; few gravel-size rock fragments; FeO bands with minor MnO streaks; 2.5Y/3/2; SM; moist to saturated.	S-3	23.5 - 25	2-16-50/2			90	
24	798.30								



**DRILLING LOG**  
**GEOLOGICAL SERVICES**

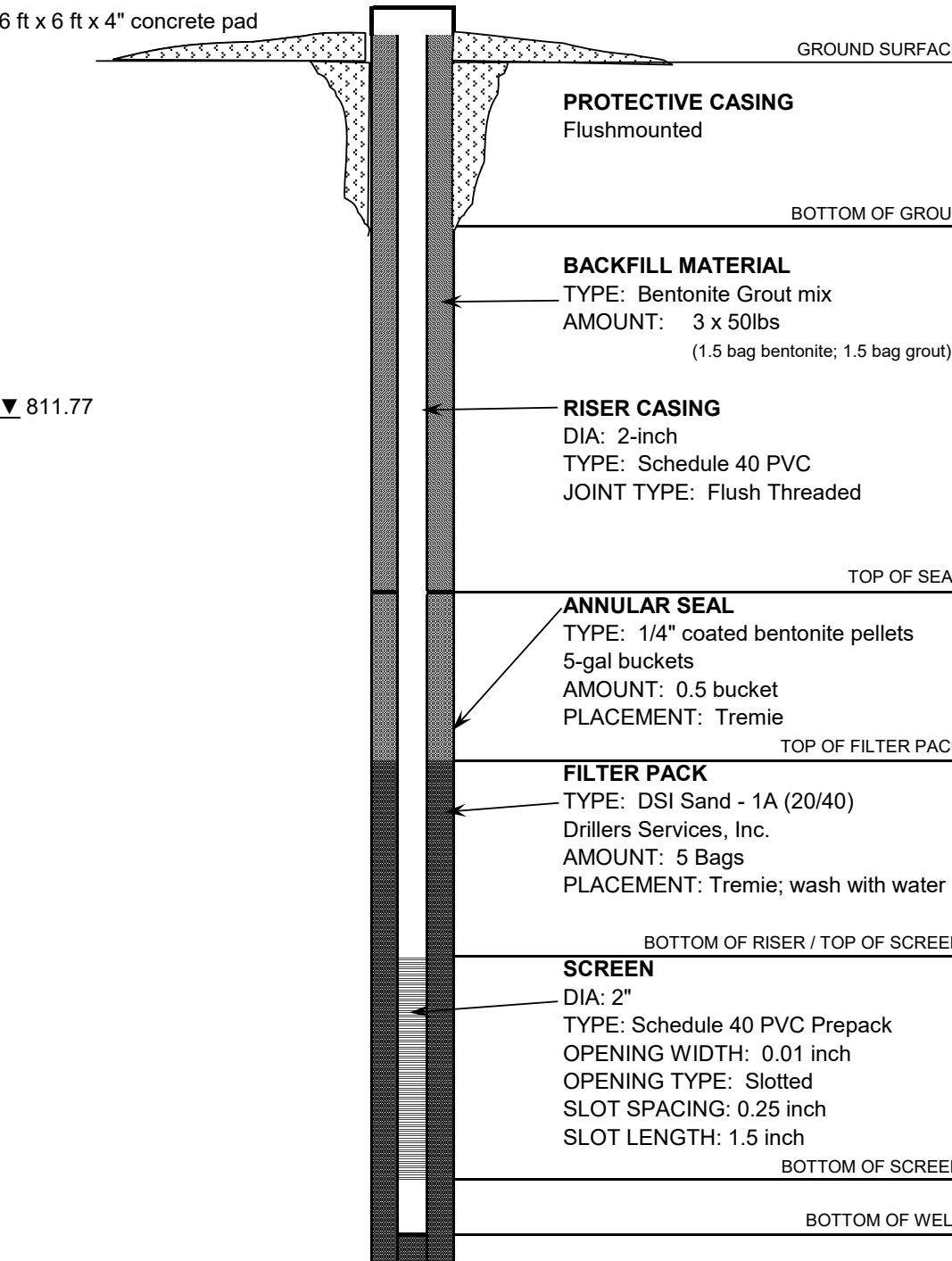
Hole No. **B-65**  
Sheet 2 of 2

SITE		Plant McDonough		TOTAL DEPTH		50'	SURF. ELEV.		822.30
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test			Comments	% Rec	RQD
25	797.30	<b>SILTY SAND SAPROLITE</b>  Dark gray to reddish brown silty sand with minor clay; few structures; 2.5Y/3/2; SM; saturated.	S-4	28.5-30	50/2			90	
26	796.30								
27	795.30								
28	794.30								
29	793.30								
30	792.30	<b>SILTY SAND SAPROLITE</b>  Dark gray to reddish brown silty sand with minor gravel; damp to saturated; 2.5Y/3/2	S-5	33.5 - 35	50/2			90	
31	791.30								
32	790.30								
33	789.30								
34	788.30								
35	787.30	<b>SILTY SAND SAPROLITE</b>  Dark gray to reddish brown silty sand with minor clay; saprolite; saturated; 2.5YR/3/2	S-6	38.5 - 40	6-9-32			90	
36	786.30								
37	785.30								
38	784.30								
39	783.30								
40	782.30	Top of Rock - 42-ft	S-7	40 - 42	50/2			90	
41	781.30								
42	780.30								
43	779.30								
44	778.30								
45	777.30	BACKFILLED & SET REGOLITH WELL		42 - 49.9				95	
46	776.30								
47	775.30								
48	774.30								
49	773.30								
50	772.30	END OF BORING - 49.9-FT							
51	771.30								
52	770.30								
53	769.30								
54	768.30								
55	767.30								
56	766.30								



## WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS, Inc.		WELL NAME	
NE of AP-4 at Argos, near N corner parking lot		DRILLER: Milam			
LOCATION: 33.832862 / -84.471389		RIG TYPE: CME550		B-65	
LOGGER: Abraham		DRILLING METHODS: HSA			
DATE CONSTRUCTED: 11/15/2016		Survey Coordinates: N: 1394381.2 E: 2204050.8			
 <p>6 ft x 6 ft x 4" concrete pad</p> <p>GROUND SURFACE</p> <p><b>PROTECTIVE CASING</b> Flushmounted</p> <p>BOTTOM OF GROUT</p> <p><b>BACKFILL MATERIAL</b> TYPE: Bentonite Grout mix AMOUNT: 3 x 50lbs (1.5 bag bentonite; 1.5 bag grout)</p> <p><b>RISER CASING</b> DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded</p> <p>TOP OF SEAL</p> <p><b>ANNULAR SEAL</b> TYPE: 1/4" coated bentonite pellets 5-gal buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie</p> <p>TOP OF FILTER PACK</p> <p><b>FILTER PACK</b> TYPE: DSI Sand - 1A (20/40) Drillers Services, Inc. AMOUNT: 5 Bags PLACEMENT: Tremie; wash with water</p> <p>BOTTOM OF RISER / TOP OF SCREEN</p> <p><b>SCREEN</b> DIA: 2" TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01 inch OPENING TYPE: Slotted SLOT SPACING: 0.25 inch SLOT LENGTH: 1.5 inch</p> <p>BOTTOM OF SCREEN</p> <p>BOTTOM OF WELL</p> <p>HOLE DIA: 9 inch</p> <p>TYPE: 1/4" coated bentonite pellets between 45.4' and 49.9'</p>				DEPTH FEET TOC	ELEVATION FT, MSL
					821.95
					822.30
					819.3
					795.5
					790.5
	787.9				
	777.9				
	776.9				
	49.9	772.4			





# **DRILLING LOG** **GEOLOGICAL SERVICES**

Hole No. **B-66**  
Sheet 1 of 2

SITE <b>Plant McDonough</b>		HOLE DEPTH <b>55.5'</b>	SURFELEV <b>813.30</b>
LOCATION <b>North of AP-4, near property line concrete pile</b>		COORDINATES <b>33.831427</b>	<b>-84.470638</b>
ANGLE _____	BEARING _____	CONTRACTOR <b>SCS</b>	DRILL NO. _____
DRILLING METHOD <b>HSA</b>		NO. SAMPLES _____	NO. U.D. SAMPLES <b>0</b>
CASING SIZE <b>2"</b>	LENGTH <b>10'</b>	CORE SIZE _____	TOTAL % REC. _____
WATER TABLE DEPTH <b>14.8' BLS</b>		ELEV. <b>798.50' NAVD88</b>	TIME AFTER COMP. _____
TYPE GROUT _____		QUANTITY _____	MIX _____
DRILLER <b>Milam</b>		RECORDER <b>Abraham</b>	APPROVED _____
		DRILLING START DATE <b>11/16/2016</b>	
		DRILLING COMP. DATE <b>11/16/2016</b>	

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test			Comments	% Rec	RQD
				From To	Blows	N			
0	813.30								
1	812.30								
2	811.30								
3	810.30								
4	809.30								
5	808.30	<b>HYDRO-EXCAVATION</b> Hydrovac from land surface to 10-feet below land. No samples							
6	807.30								
7	806.30								
8	805.30								
9	804.30								
10	803.30								
11	802.30								
12	801.30								
13	800.30								
14	799.30	<b>CLAYEY SILT</b> Light Brown to reddish brown clayey silt; 10R/5/6; damp; FeO along fracture traces & relict foliations; organics absent.	S-1	13.5-15	2-1-1	2		85	
15	798.30								
16	797.30								
17	796.30								
18	795.30								
19	794.30	<b>CLAYEY SILT</b> Light Brown to reddish brown clayey silt; 10R/5/6; damp; FeO along fracture traces & relict foliations;	S-2	18.5-20	2-1-5	6		90	
20	793.30								
21	792.30								
22	791.30	<b>CLAYEY SILT</b> Brownish gray with reddish streaks clayey silt grading to brownsh gray saprolite; 10YR/6/3; moist; FeO bands with minor MnO streaks along fracutre traces; distinct MnO layer at 25-ft parallel to foliation; fractures increase at 25-ft.	S-3	3-4-9	3-4-9	14		90	
23	790.30								
24	789.30								



**DRILLING LOG  
GEOLOGICAL SERVICES**

Hole No. **B-66**

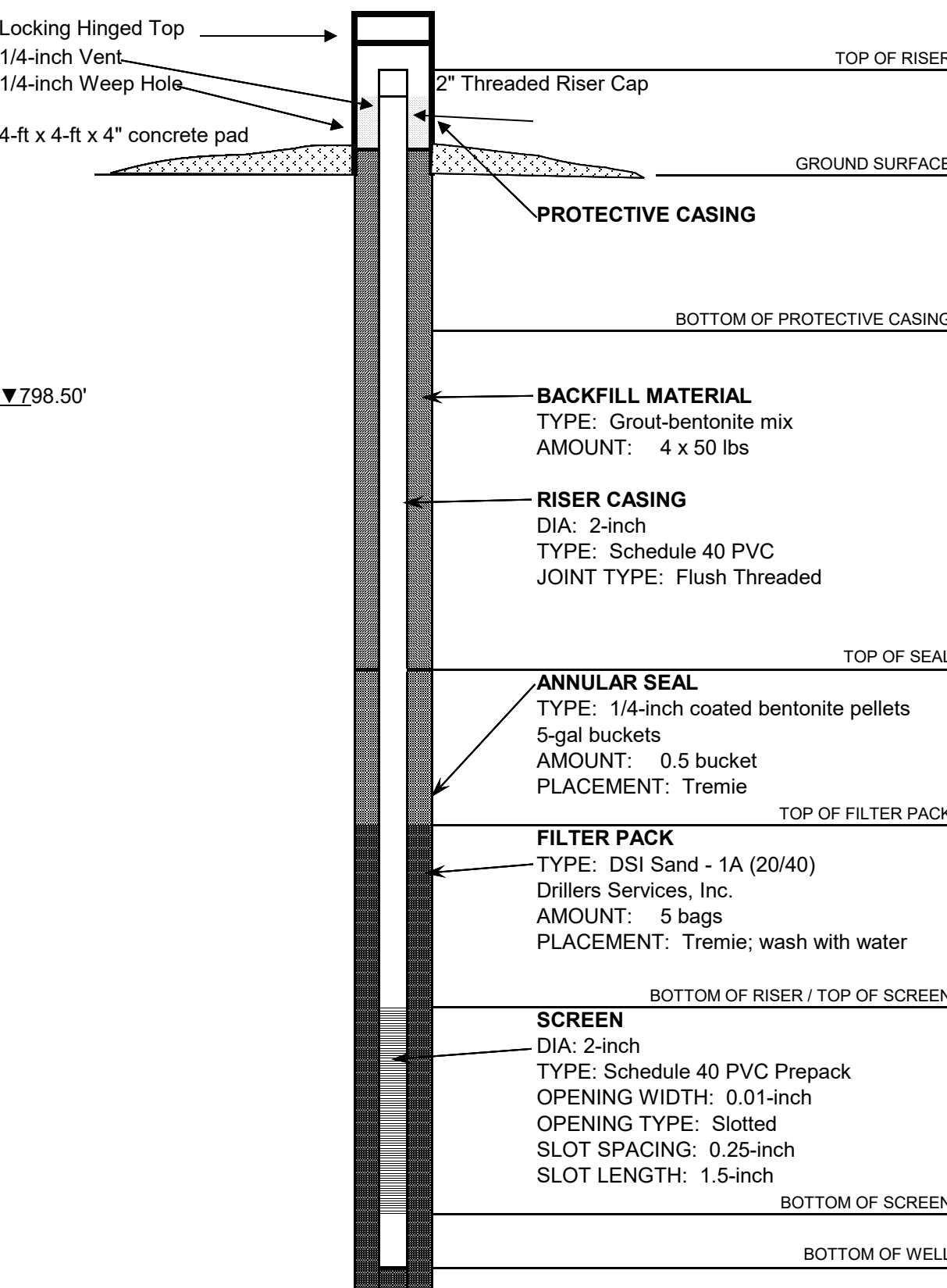
Sheet 2 of 2

SITE		Plant McDonough		TOTAL DEPTH		55.5'		SURF.ELEV.		813.30	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test			Comments	% Rec	RQD		
				From To	Blows	N					
25	788.30	<b>SILTY SAND</b>  Medium to dark gray silty sand with minor clay; 2.5Y/5/2; few brownish-black weathered minerals; micaceous texture; MnO bands along fracture & foliations; saprolite between 28 and 30 feet.	S-4	4-5-10	15	80					
26	787.30										
27	786.30										
28	785.30										
29	784.30										
30	783.30	<b>SILTY SAND SAPROLITE</b>  Light to dark gray SILTY SAND; 5Y/5/3; moist to wet saprolite; gravel-size rock frags; weathered feldspars & quartz; increasing biotite & MnO at 35-feet.	S-5	7-9-16	25	90					
31	782.30										
32	781.30										
33	780.30										
34	779.30										
35	778.30	Grayish brown - brownish-black SILTY SAND with minor clay; 5Y/3/2; fewer rock fragments than above; moist to wet.	S-6	6-8-10	18	90					
36	777.30										
37	776.30										
38	775.30										
39	774.30										
40	773.30	<b>SILTY SAPROLITE</b> Yellowish brown silt with minor clay saprolite; 2.5Y/6/3; lighter than above; abundant MnO streaks; wet but not saturated.	S-7	5-6-9	16	90					
41	772.30										
42	771.30										
43	770.30										
44	769.30										
45	768.30	<b>SILTY SAND SAPROLITE</b> Yellowish to blackish brown SILTY SAND saprolite; 2.5Y/6/3; minor rock fragments; saturated	S-8	6-7-17	24	90					
46	767.30										
47	766.30										
48	765.30										
49	764.30										
50	763.30	<b>SILTY SAND SAPROLITE</b> Yellowish brown silty sand saprolite; minor clay; 2.5Y/6/3; abundant MnO streaks parallel to relict foliations; saturated.	S-9	7-8-18	26	90					
51	762.30										
52	761.30										
53	760.30										
54	759.30										
55	758.30	END OF BORING: REGOLITH WELL									
56	757.30										



# WELL CONSTRUCTION LOG

Southern Company Generation

PROJECT: Plant McDonough		DRILLING CO.: SCS, Inc.		WELL NAME	
NE of AP-4 at Argos, nr concrete pile, ~250' NE of DGWC-10		DRILLER: Wideman			
LOCATION:33.831427 / -84.470638		RIG TYPE: CME 550			
LOGGER: Abraham		DRILLING METHODS: HSA		<b>B-66</b>	
DATE CONSTRUCTED: 3/7/2016		Survey Coordinates: N: 1393858.2 E: 2204277.5			
 <p>Locking Hinged Top</p> <p>1/4-inch Vent</p> <p>1/4-inch Weep Hole</p> <p>4-ft x 4-ft x 4" concrete pad</p> <p>2" Threaded Riser Cap</p> <p>PROTECTIVE CASING</p> <p>BACKFILL MATERIAL TYPE: Grout-bentonite mix AMOUNT: 4 x 50 lbs</p> <p>RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded</p> <p>ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 0.5 bucket PLACEMENT: Tremie</p> <p>FILTER PACK TYPE: DSI Sand - 1A (20/40) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water</p> <p>SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch</p> <p>HOLE DIA: 9"</p>				DEPTH FEET	ELEVATION FT, MSL
				TOP OF RISER	-1.89
GROUND SURFACE	0.00	813.33			
BOTTOM OF PROTECTIVE CASING					
▼798.50'					
TOP OF SEAL				37.6	775.7
TOP OF FILTER PACK				41.7	771.6
BOTTOM OF RISER / TOP OF SCREEN				45.0	768.3
BOTTOM OF SCREEN				55.0	758.3
BOTTOM OF WELL				55.3	758.0



# RECORD OF BOREHOLE DGWC-67/B-67

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 56.00 ft  
LOCATION: West Toe of AP-1

DRILL RIG: Geoprobe  
DATE STARTED: 3/8/17  
DATE COMPLETED: 3/14/17

NORTHING: 1,390,953.80  
EASTING: 2,200,830.70  
GS ELEVATION: 766.80  
TOC ELEVATION: 766.70 ft

DEPTH W.L.: 9.1  
ELEVATION W.L.: 757.9  
DATE W.L.: 3/14/17  
TIME W.L.: 0850

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	BLOWS per 6 in  140 lb hammer 30 inch drop	N-VALUE	REC		
					DEPTH (ft)						
0		0.00 - 10.00 Silt and Clay with some sand and pebbles, brown, highly weathered mica schist, low plastic, cohesive, dry.	ML							Flush Mounted Casing	<b>WELL CASING</b> Interval: 0'-46.3' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 46.3'-56.3' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 44.0'-56.7' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 44.0'-41.8' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-41.8' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 4'x4' Concrete Protective Casing: 8" Round Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
5					S1	GRAB			0.50		
	765										
	760										
10		10.00 - 15.00 Sandy Silt, sands fine, brown, highly weathered, micaceous, low plastic, cohesive, dry.	ML		756.8	S2	GRAB		0.50	CETCO puregold - grout (70:30)	
	755										
	750	15.00 - 20.00 Sandy Silt, sands fine, brown, highly weathered, micaceous, low plastic, cohesive, moist.	ML		751.8	S3	SPT	6-7-12	19	1.50 1.50	
15											
	745	20.00 - 25.00 Sandy silt, sand f-m, brown to tan, highly weathered, micaceous, low-medium plasticity, cohesive, moist, sample spoon wet.	ML		746.8	S4	SPT	9-25-25	50	1.50 1.50	
20											
	740	25.00 - 30.00 Saprolite, Sandy silt, sands fine to coarse, brown to tan, highly weathered, micaceous, low plastic, cohesive, moist, sample spoon wet.	ML		741.8	S5	SPT	6-10-14	24	1.16 1.50	
25											
	735	30.00 - 35.00 Saprolite, Sandy silt, sands fine to coarse, trace pebbles, reddish brown to tan, highly weathered, micaceous, low plastic, cohesive, moist, sample spoon wet.	ML		736.8	S6	SPT	13-20-22	42	1.16 1.50	
30											
	730	35.00 - 40.00 Saprolite, Sandy silt, sands fine to coarse, trace pebbles, reddish brown to tan, highly weathered, micaceous, low plastic, cohesive, moist, sample spoon wet.	ML		731.8	S7	SPT	7-10-13	23	1.00 1.50	
35											
	725	40.00 - 45.00 Saprolite, Sandy silt, sands fine to medium, reddish brown to tan, highly weathered, micaceous, low plastic, cohesive, moist, sample spoon wet.	ML		726.8	S8	SPT	7-16-23	39	1.33 1.50	
40											
					721.8	S9	SPT	12-15-18	33	1.16 1.50	
45											
Log continued on next page											

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Ben Hodges  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20







# RECORD OF BOREHOLE B-68 / DGWC-68

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 40.40 ft  
LOCATION: West Toe of AP-1

DRILL RIG: Geoprobe  
DATE STARTED: 3/16/17  
DATE COMPLETED: 3/16/17

NORTHING: 1,391,298.20  
EASTING: 2,200,714.20  
GS ELEVATION: 759.05  
TOC ELEVATION: 758.68 ft

DEPTH W.L.: 3.5  
ELEVATION W.L.: 755.06  
DATE W.L.: 3/16/17  
TIME W.L.: 1700

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC	
					DEPTH (ft)								
0		0.00 - 10.00 Hydrovac										<div>Flush Mounted Casing</div> <div>CETCO puregold grout (70:30)</div> <div>PEL-PLUG 3/8" Bentonite pellets</div> <div>FilterSil</div> <div>.010" Slotted Schedule 40 PVC</div> <div>FilterSil</div> <div>PEL-PLUG 3/8" Bentonite pellets</div>	<div><b>WELL CASING</b> Interval: 0'-8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen</div> <div><b>WELL SCREEN</b> Interval: 8.0'-18.0' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC</div> <div><b>FILTER PACK</b> Interval: 6.1'-18.4' Type: FilterSil</div> <div><b>FILTER PACK SEAL</b> Interval: 4.1'-6.1' Type: PEL-PLUG 3/8" Bentonite pellets</div> <div><b>ANNULUS SEAL</b> Interval: 0'-4.1' Type: CETCO puregold grout (70:30)</div> <div><b>WELL COMPLETION</b> Pad: 4'x4' Concrete Protective Casing: 8" Round Flush Mount</div> <div><b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell</div>
755													
5													
750													
10		10.00 - 15.00 Sandy Silt, fine to medium sand, dark brown, highly weathered, micaceous, cohesive, moist, firm, sample spoon wet	ML		749 10.00								
745													
15		15.00 - 18.80 Silty Sand, fine to coarse, trace gravel, greenish grey, weathered, thinly bedded, noncohesive, very dense, (weathered gneiss)	PWR		744 15.00	S1	SPT	5-6-5	11	1.08 1.50			
740													
20		19.20 - 22.80 Slightly weathered to fresh, weakly foliated, light gray to white, fine to very fine grained, medium strong to strong, MYLONITE (White Mylonite).	BR		740.2 19.20	S2	SPT	50/3	50/3	0.25 0.25			
735													
25		22.80 - 24.10 Slight to moderately weathered, weakly foliated, dary gray to black , fine to very fine grained, medium strong, MYLONITE (Black Mylonite).	BR		736.2 22.80 734.9 24.10								
730		24.10 - 28.90 Slightly weathered to fresh, weakly foliated, interlayered with vein quartz (~1"), light grey to white, fine to very fine grained, medium strong to strong, MYLONITE (White Mylonite).	BR		730.1 28.90								
30		28.90 - 38.00 Slightly weathered to fresh, moderate to strongly foliated, interlayered with Black Mylonite (~1") and pegmatites (~1 to 2"), light to dark gray, fine to coarse grained, medium strong to strong, Sheared Gneiss (Long Island Creek).	BR										
725													
40		38.00 - 39.20 Slight to moderately weathered, weakly foliated, dary gray to black , fine to very fine grained, medium strong, MYLONITE (Black Mylonite).	BR		721 38.00 719.8 39.20 718.6								
720		39.20 - 40.40 Slightly weathered to fresh, moderate to strongly foliated, light to dark gray, fine to coarse grained, medium strong to strong, Sheared Gneiss (Long Island Creek).											
715		Boring completed at 40.40 ft											

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: Sean Denty

GA INSPECTOR: Ben Hodges  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE DGWC-68A/B-68A



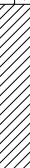

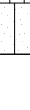
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 30.00 ft  
LOCATION: ~15' East of B-68

DRILL RIG: Geoprobe 7822DT  
DATE STARTED: 4/19/17  
DATE COMPLETED: 4/20/17

NORTHING: 1,391,301.20  
EASTING: 2,200,734.90  
GS ELEVATION: 765.06  
TOC ELEVATION: 765.33 ft

DEPTH W.L.: 18.8  
ELEVATION W.L.: 746.6  
DATE W.L.: 4/20/2017  
TIME W.L.: 08:48

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC			
					DEPTH (ft)								
0	765	0.00 - 8.50 SM, Silty SAND, fine to coarse, moderate plasticity; red-orange to orange-brown, fill; non-cohesive, moist, w~PL, loose.	SM								8" Diameter Round Flush Mount		<b>WELL CASING</b> Interval: 0' - 29.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 19.4' - 29.4 ' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 29.4' - 29.8'  <b>FILTER PACK</b> Interval: 17.0' - 29.8' Type: FilterSil gravel pack  <b>FILTER PACK SEAL</b> Interval: 15.0' - 17.0' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0' - 15.0' Type: Pure Gold Grout Mixture  <b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 8" Diameter Round Flush Mount  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A
5	760												
10	755	8.50 - 13.50 CL, CLAY, with trace sand, moderate plasticity; red-orange brown, fill; cohesive, moist, w<PL, soft to firm.	CL		756.6 8.50	S1	DO	13-18-9	27	$\frac{1.50}{1.50}$	Pure Gold Grout – Mixture		
					751.6 13.50								
15	750	13.50 - 28.50 ML, SILT, low plasticity; brown to silver, relict structure; cohesive, moist to wet, w<PL, very soft.	ML			S2	DO	WOH-WOH-3	3	$\frac{1.50}{1.50}$	Pel-Plug 3/8" Bentonite – Pellets		
20	745					S3	DO	4-6-16	22	$\frac{1.33}{1.50}$	Pre-pack 0.010" Slotted – Schedule 40 PVC		
25	740					S4	DO	WOH-16-24	40	$\frac{1.50}{1.50}$			
30	735	28.50 - 30.00 SM, Silty SAND, fine to coarse, non-plastic to low plasticity; gray to white to silver, weathered saprolite, gneiss; cohesive, wet, w<PL, firm.  Boring completed at 30.00 ft	SM		736.6 28.50 735.1	S5	DO	13-50/5	50/5	$\frac{0.75}{0.92}$			
35	730												
40	725												
45													

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE DGWC-69/B-69

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 44.30 ft  
LOCATION: West Toe of AP-1

DRILL RIG: Geoprobe  
DATE STARTED: 3/15/17  
DATE COMPLETED: 3/16/17

NORTHING: 1,391,585.00  
EASTING: 2,200,657.10  
GS ELEVATION: 763.99  
TOC ELEVATION: 763.75 ft

DEPTH W.L.: 6.0  
ELEVATION W.L.: 758  
DATE W.L.: 3/17/17  
TIME W.L.: 0840

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 10.00 Hydrovac									Flush Mount Casing	<b>WELL CASING</b> Interval: 0'-14.3' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen  <b>WELL SCREEN</b> Interval: 14.3'-24.3' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 12.0'-24.7' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 10.0'-12.0' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 0'-10.0' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 4'x4' Concrete Protective Casing: 8" Round Flush  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: HQ Core Barrell
760											CETCO puregold grout (70:30)	
755												
10		10.00 - 24.90 Silty Sand, fine to coarse, banded grey and brown, highly weathered, noncohesive, moist, very dense, sample spoon wet			754 10.00						PEL-PLUG 3/8" Bentonite pellets	
750						S1	SPT	26-36-48	84	1.58 1.50		
15			SM								FilterSil	
745						S2	SPT	3-23-17	40	1.00 1.50		
20											.010" Slotted Schedule 40 - PVC	
740						S3	SPT	50/6	50/6	0.50 0.50		
25		24.90 - 44.30 Slightly weathered to fresh, moderate to strongly foliated, light to dark gray, fine to coarse grained, medium strong to strong, Sheared Gneiss (Long Island Creek).			739.1 24.90						FilterSil	
735												
30												
730			BR								PEL-PLUG 3/8" Bentonite pellets	
35												
725												
40												
720												
45		Boring completed at 44.30 ft			719.7							

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: Sean Denty

GA INSPECTOR: Ben Hodges  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE DGWA-70A/B-70A







SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 60.00 ft  
LOCATION: ~400' west of the SW corner of AP-1

DRILL RIG: CME 550  
DATE STARTED: 5/10/17  
DATE COMPLETED: 5/10/17

NORTHING: 1,390,481.40  
EASTING: 2,200,591.60  
GS ELEVATION: 805.67  
TOC ELEVATION: 808.52 ft

DEPTH W.L.: 42.9  
ELEVATION W.L.: 762.9  
DATE W.L.: 5/10/2017  
TIME W.L.: 10:45

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0	805	0.00 - 5.00 CL-CH, low to high plasticity CLAY with trace fine sand; red orange; cohesive, moist	CL-CH									<b>WELL CASING</b> Interval: 0' - 59.3' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 48.9' - 58.9' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 58.9' - 59.3'  <b>FILTER PACK</b> Interval: 46.9' - 59.3' Type: FilterSil Gravel Pack  <b>FILTER PACK SEAL</b> Interval: 43.4' - 46.9' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0' - 43.4' Type: Pure Gold Grout Mixture  <b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 4" x 4" x 5' Aluminum  <b>DRILLING METHODS</b> Soil Drill: 8.25 Hollow-Stem Auger Rock Drill: N/A
5	800	5.00 - 13.50 ML, SILT, trace fine sand, low plasticity; yellowish brown, contains mica; cohesive, moist, w<PL, soft.	ML		800.7 5.00							
10	795											
15	790	13.50 - 28.50 ML, SILT, trace fine to coarse sand, non to low plasticity; yellowish brown to orange brown, iron staining weathered, relict structure (gneissic); cohesive, moist, w<PL, soft.	ML		792.2 13.50	S1	DO	6-7-7	14	0.83 1.50		
20	785		ML			S2	DO	5-9-13	22	1.50 1.50		
25	780					S3	DO	5-9-10	19	1.50 1.50		
30	775	28.50 - 38.50 ML, SILT, trace sand, low plasticity; medium to dark gray, highly micaceous; cohesive, moist to wet (increase with depth), w<PL, soft.	ML		777.2 28.50	S4	DO	5-8-11	19	1.50 1.50		
35	770					S5	DO	5-11-15	26	1.50 1.50		
40	765	38.50 - 53.50 ML, SILT, trace sand, low plasticity; medium to dark gray, saprolite, highly micaceous; cohesive, moist to wet (increase with depth), w<PL, soft.	ML		767.2 38.50	S6	DO	4-8-10	18	1.50 1.50		
45		Log continued on next page				S7	DO	20-50/4	50/4	0.75 1.50		

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE DGWA-70A/B-70A

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 60.00 ft  
LOCATION: ~400' west of the SW corner of AP-1

DRILL RIG: CME 550  
DATE STARTED: 5/10/17  
DATE COMPLETED: 5/10/17

NORTHING: 1,390,481.40  
EASTING: 2,200,591.60  
GS ELEVATION: 805.67  
TOC ELEVATION: 808.52 ft

DEPTH W.L.: 42.9  
ELEVATION W.L.: 762.9  
DATE W.L.: 5/10/2017  
TIME W.L.: 10:45

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45	760	38.50 - 53.50 ML, SILT, trace sand, low plasticity; medium to dark gray, saprolite, highly micaceous; cohesive, moist to wet (increase with depth), w<PL, soft. (Continued)	ML		752.2						FilterSil Gravel Pack	<b>WELL CASING</b> Interval: 0' - 59.3' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 48.9' - 58.9' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 58.9' - 59.3'  <b>FILTER PACK</b> Interval: 46.9' - 59.3' Type: FilterSil Gravel Pack  <b>FILTER PACK SEAL</b> Interval: 43.4' - 46.9' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0' - 43.4' Type: Pure Gold Grout Mixture  <b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 4" x 4" x 5' Aluminum  <b>DRILLING METHODS</b> Soil Drill: 8.25 Hollow-Stem Auger Rock Drill: N/A
50	755					S8	DO	50/4	50/4	0.00 1.50		
55	750	53.50 - 60.00 SM, Silty SAND, fine grained, low plasticity; dark gray, contains mica; non-cohesive, moist, w<PL, dense.				S9	DO	50/3	50/3	0.25 1.50		
60	745	Boring completed at 60.00 ft	PWR		745.7	S10	DO	50/2	50/2	0.17 1.50	0.010" Slotted Schedule 40 PVC	
65	740											
70	735											
75	730											
80	725											
85	720											
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE DGWA-71/B-71

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 43.80 ft  
LOCATION: NW corner of site, inside cell tower gate.

DRILL RIG: CME 550  
DATE STARTED: 2/28/17  
DATE COMPLETED: 2/28/17

NORTHING: 1,393,963.30  
EASTING: 2,201,714.80  
GS ELEVATION: 861.22  
TOC ELEVATION: 863.84 ft

DEPTH W.L.: 27.1  
ELEVATION W.L.: 834.1  
DATE W.L.: 2/28/17  
TIME W.L.: 1245

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC	
0	860	0.00 - 10.50 Hydrovac									<b>WELL CASING</b> Interval: 0'-33.4' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen  <b>WELL SCREEN</b> Interval: 33.4'-43.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32.6'-43.8' Type: FilterSil  <b>FILTER PACK SEAL</b> Interval: 30.6'-32.6' Type: PEL-PLUG 3/8" Bentonite pellets  <b>ANNULUS SEAL</b> Interval: 1'-30.6' Type: CETCO puregold grout (70:30)  <b>WELL COMPLETION</b> Pad: 4'x4' Concrete Protective Casing: 4" x 4" x 5' Aluminum  <b>DRILLING METHODS</b> Soil Drill: Hollow-stem auger Rock Drill: N/A
5	855										
10	850	10.50 - 20.00 Sand with some silt, sands fine, white/black/grey weathered granite/granite gneiss, non plastic, moist, compact.			850.7 10.50						
15	845		SP-SM			S1	SPT	4-8-10	18	1.50 1.50	
20	840	20.00 - 30.00 Silty Sand, sands fine, white/black/grey weathered granite/granite gneiss, non plastic, moist, dense.			841.2 20.00	S2	SPT	2-5-7	12	1.50 1.50	CETCO puregold - grout (70:30)
25	835		SM			S3	SPT	4-7-11	18	1.50 1.50	
30	830	30.00 - 35.00 Sand with trace to some silt, sands fine to medium, white/black/grey, non plastic, moist, very dense.			831.2 30.00	S4	SPT	8-21-50/4	71/10	1.33 1.33	
35	825	35.00 - 43.80 Sand with trace silt and gravel (rock fragments), sands fine to medium, white/black/grey, non plastic, wet, very dense, and some iron staining in samples.			826.2 35.00	S5	SPT	43-50/2	50/2	0.67 0.67	
40	820		PWR			S6	SPT	50/3	50/3	0.25 0.25	PEL-PLUG 3/8" Bentonite pellets  0.010" Slotted Schedule 40 PVC  FilterSil -
45		Boring completed at 43.80 ft			817.4	S7	SPT	50/3	50/3	0.25 0.25	

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 1/16/18





# RECORD OF BOREHOLE B-72

SHEET 1 of 1

PROJECT: SCS-Plant McDonough  
PROJECT NUMBER: 1779172  
DRILLED DEPTH: 21.90 ft  
LOCATION: ~50' SSE of B-68

DRILL RIG: Geoprobe 7822DT  
DATE STARTED: 4/19/17  
DATE COMPLETED: 4/19/17

NORTHING: 1,391,241.4  
EASTING: 220,0725.9  
GS ELEVATION: 758.45  
TOC ELEVATION: 758.46 ft

DEPTH W.L.: 2.90  
DATE W.L.: 5/2/2017  
TIME W.L.: 09:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 5.00 ML, SILT, with trace fine sand and gravels (rock fragments), low plasticity; brown; cohesive, moist, w<PL, soft.	ML								<p>8" Diameter Round Flush Mount</p> <p>Pure Gold Grout Mixture</p> <p>Pel-Plug 3/8" Bentonite Pellets</p> <p>FilterSil gravel pack</p> <p>Pre-pack 0.010" Slotted Schedule PVC</p>	<p><b>WELL CASING</b> Interval: 0' - 21.9' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw</p> <p><b>SURFACE CASING</b> Interval: Material: Diameter:</p> <p><b>WELL SCREEN</b> Interval: 11.5' - 21.5' Material: Schedule 40 PVC Pre-Pack Diameter: 2" Slot Size: 0.010" End Cap: 21.5' - 21.9'</p> <p><b>FILTER PACK</b> Interval: 9.8' - 21.9' Type: FilterSil gravel pack</p> <p><b>FILTER PACK SEAL</b> Interval: 7.7' - 9.8' Type: Pel-Plug 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 0' - 7.7' Type: Pure Gold Grout Mixture</p> <p><b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 8" Diameter Round Flush Mount</p> <p><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A</p> <p><b>NOTES</b></p>
5		5.00 - 13.50 SP-SM, Poorly-graded SAND with Silt, fine, low plasticity; red-orange brown, relict structure, highly micaceous; cohesive, wet, w<PL, very soft.	SP-SM		753.5 5.00							
10												
15		13.50 - 18.50 SM, Silty SAND with trace fine gravels, non-plastic to low plasticity; dark brown to dark gray, highly micaceous; non-cohesive, dry to moist, w<PL, compact.	SM		745.0 13.50	S1	OD	25-50/3	50/3	0.75 1.50		
20		18.50 - 21.50 ML, SILT, with trace sand and large gravels, low plasticity; brown to dark gray black, saprolitic, highly micaceous, gneiss; cohesive, wet, w<PL, soft to firm.	ML		740.0 18.50	S2	OD	17-34-8	42	1.50 1.50		
21.90		Boring completed at 21.90 ft			737.0 21.50							

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/17/17



BOREHOLE RECORD 1779172.GPJ PIEDMONT.GDT 5/18/17



# RECORD OF BOREHOLE B-73

SHEET 1 of 1

PROJECT: SCS-Plant McDonough  
PROJECT NUMBER: 1779172  
DRILLED DEPTH: 15.80 ft  
LOCATION: ~50' NNW of B-68

DRILL RIG: Geoprobe 7822DT  
DATE STARTED: 4/19/17  
DATE COMPLETED: 4/19/17

NORTHING: 1,391,351.8  
EASTING: 2,200,699.4  
GS ELEVATION: 759.16  
TOC ELEVATION: 759.21 ft

DEPTH W.L.: 4.11  
DATE W.L.: 4/26/2017  
TIME W.L.: 12:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC		
					DEPTH (ft)								
0		0.00 - 8.50 SP-SM, Poorly-graded SAND with Silt, non-plastic; red-orange brown; non-chesive, dry to moist, w<PL, loose.	SP-SM							<p>8" Diameter Round Flush Mount Pure Gold Grout Mixture Pel-Plug 3/8" Bentonite Pellets</p> <p>Pre-pack 0.010" Slotted Schedule PVC</p> <p>FilterSil gravel pack</p>	<p><b>WELL CASING</b> Interval: 0' - 15.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw</p> <p><b>SURFACE CASING</b> Interval: Material: Diameter:</p> <p><b>WELL SCREEN</b> Interval: 5.4' - 15.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 15.4' - 15.8'</p> <p><b>FILTER PACK</b> Interval: 3.2' - 15.8' Type: FilterSil</p> <p><b>FILTER PACK SEAL</b> Interval: 0.5' - 3.2' Type: Pel-Plug 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 0 - 0.5' Type: Pure Gold Grout Mixture</p> <p><b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 8" Diameter Round Flush Mount</p> <p><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A</p> <p><b>NOTES</b></p>		
755													
5													
750		8.50 - 9.50 CL, CLAY, with some silt, low plasticity; red brown; cohesive, moist, w<PL, soft.	CL		750.7 8.50 749.7	S1	DO	1-8-15	23	1.50 1.50			
10		9.50 - 15.50 SP-SM, Poorly-graded SAND with Silt, non-plastic to low plasticity; white to dark gray, Saprolitic; non-chesive, dry to moist, w<PL, compact to dense.	SP-SM		9.50								
745							S2	DO	12-29-35	64	1.50 1.50		
15		Boring completed at 15.80 ft											
740													
20													
735													
25													
730													
30													
725													
35													
720													
40													

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/17/17



BOREHOLE RECORD 1779172.GPJ PIEDMONT.GDT 5/18/17



# RECORD OF BOREHOLE B-74




SHEET 1 of 1

PROJECT: SCS-Plant McDonough  
PROJECT NUMBER: 1779172  
DRILLED DEPTH: 16.50 ft  
LOCATION: ~50' West of B-68

DRILL RIG: Geoprobe 7822DT  
DATE STARTED: 4/24/17  
DATE COMPLETED: 4/25/17

NORTHING: 1,391,279.9  
EASTING: 2,200,666.1  
GS ELEVATION: 759.18  
TOC ELEVATION: 759.06 ft

DEPTH W.L.: 3.3'  
DATE W.L.: 4/25/2017  
TIME W.L.: 09:37

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0		0.00 - 4.00 CL, CLAY, with some silt, low plasticity; red brown, fill; cohesive, moist, w<PL, soft.	CL								8" Diameter Round Flush Mount	<b>WELL CASING</b> Interval: 0' - 16.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw
755		4.00 - 13.50 SP-SM, Poorly-graded SAND with Silt and trace gravel, fine to coarse, non-plastic; white to tan, deeply weathered, granitic; non-cohesive, moist, w<PL, loose/soft.	SP-SM		755.2 4.00						Pure Gold Grout Mixture	<b>SURFACE CASING</b> Interval: Material: Diameter:
750						S1	DO	3-18-20	38	0.75 1.50	Pel-Plug 3/8" Bentonite Pellets	<b>WELL SCREEN</b> Interval: 10.8' - 15.8' Material: Pre-pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 15.8' - 16.2'
10											FilterSil gravel pack	<b>FILTER PACK</b> Interval: 9.0' - 16.5' Type: FilterSil gravel pack
745		13.50 - 16.50 SM, Silty SAND, non-plastic; white to light gray; non-cohesive, dry to moist, w<PL, dense.	SM		745.7 13.50	S2	DO	50/3	50/3	0.25 1.50	Pre-pack 0.010" Slotted Schedule 40 PVC	<b>FILTER PACK SEAL</b> Interval: 4.8' - 9.0' Type: Pel-Plug 3/8" Bentonite Pellets
15		Boring completed at 16.50 ft			742.7							<b>ANNULUS SEAL</b> Interval: 0' - 4.8' Type: Pure Gold Grout Mixture
740												<b>WELL COMPLETION</b> Pad: 4' x 4' concrete Protective Casing: 8" Diameter Round Flush Mount
20												<b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A
735												<b>NOTES</b> N/A
25												<b>ABANDONMENT NOTES:</b>  Abandoned on 10/4/2023 Tremmie grouted 17lbs Aquagrard/4 gallons water Overdrilled to 10 feet bgs.; 10-foot PVC removed. Final Grout: 38 lbs Quickrete/10 lbs AquaGuard/6.5 gallons water.
730												
30												
725												
35												
720												
40												

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/17/17



BOREHOLE RECORD 1779172.GPJ PIEDMONT.GDT 5/18/17



# RECORD OF BOREHOLE B-76

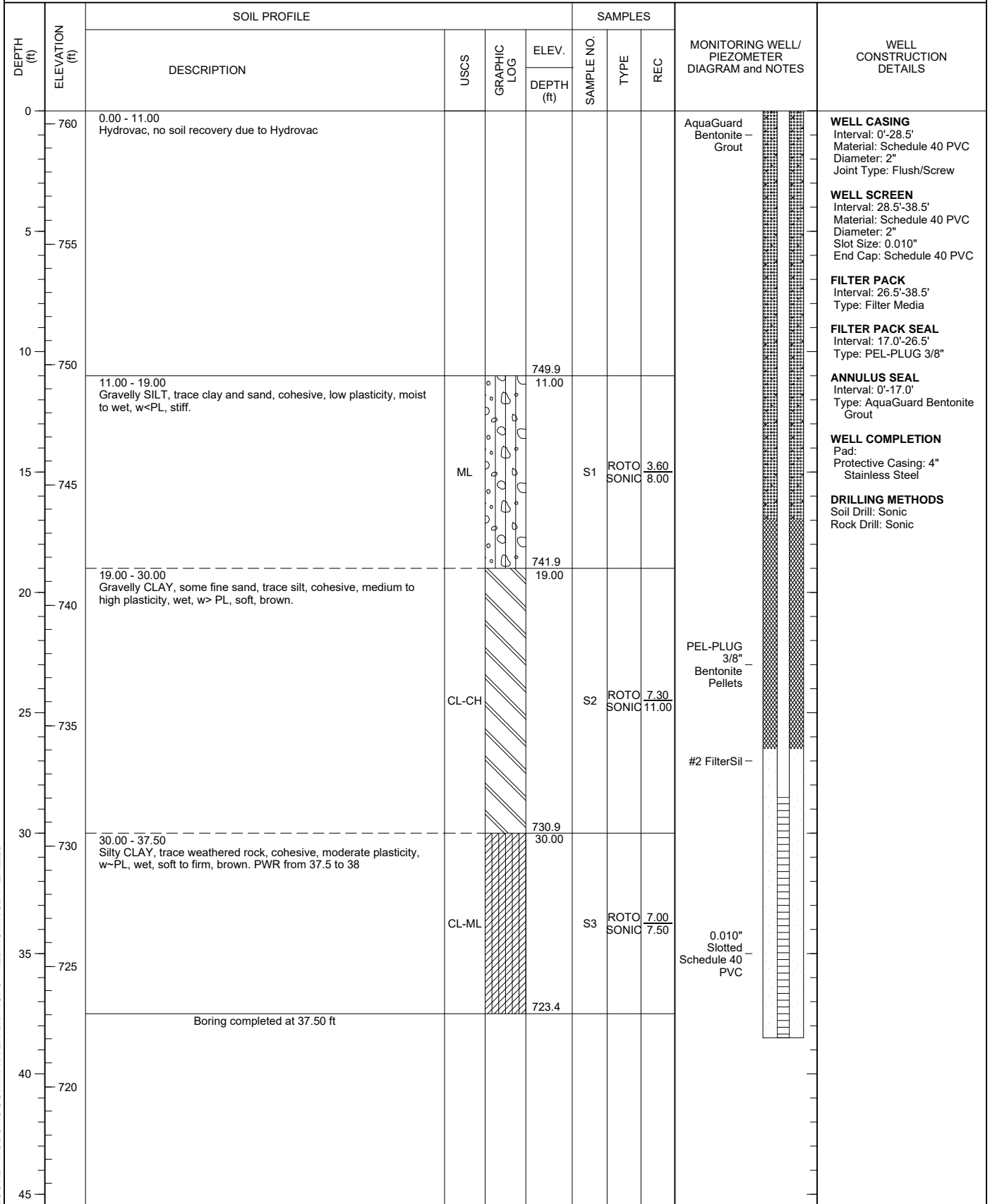
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496-01  
DRILLED DEPTH: 37.50 ft  
LOCATION: South by river, SE of B-83

DRILL RIG: Rotosonic 1159  
DATE STARTED: 9/16/19  
DATE COMPLETED: 9/16/19

NORTHING: 1,390,717.4  
EASTING: 2,202,756.9  
GS ELEVATION: 760.87 ft  
TOC ELEVATION: 760.53 ft

DEPTH W.L.: 38.5  
DATE W.L.: 9/17/2019  
TIME W.L.: 1300  
GW ELEVATION:



BOREHOLE RECORD MCDONOUGH MASTER LIST.GPJ PIEDMONT.GDT 2/12/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: D. Thomas  
CHECKED BY: Brian Steele, PG  
DATE: 2/10/20





# RECORD OF BOREHOLE B-77

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 42.00 ft  
LOCATION: South by river, SW of B-63

DRILL RIG: Rotosonic 1159  
DATE STARTED: 9/17/19  
DATE COMPLETED: 9/17/19

NORTHING: 1,390,948.70  
EASTING: 2,202,942.00  
GS ELEVATION: 777.12 ft  
TOC ELEVATION: 776.86 ft

DEPTH W.L.: 28.50  
ELEVATION W.L.: 748.6  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:39

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 8.00 Hydrovac, no soil recovery due to Hydrovac							AquaGuard Bentonite - Grout	<b>WELL CASING</b> Interval: 0'-32' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 32'-42' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 30'-42' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 22'-30' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-22' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4'x4' Concrete Protective Casing: 4" Stainless Steel  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic
775										
5										
770										
		8.00 - 10.00 Fill			769.1	S1	ROTO SONIC	0.17 0.17		
10					767.1	S2	ROTO SONIC	0.67 0.83		
		10.00 - 20.00 Sandy SILT, trace clay, some gravel, reddish brown, low plasticity, w<PL, moist, firm, cohesive			10.00					
765										
15			MLS							
760										
20					757.1	S3	ROTO SONIC	0.38 0.83		
		20.00 - 30.00 Sandy SILT, micaceous, trace clay, some gravel, reddish brown, low plasticity, w<PL, moist, firm, cohesive			20.00					
755										
25			MLS							
750										
30					747.1	S4	ROTO SONIC	0.52 0.83		
		30.00 - 40.00 Silty CLAY, some sand, transitioning from reddish-brown to brownish gray, w~PL, moderate plasticity, moist to wet, soft to firm, cohesive,			30.00					
745										
35			CL-ML							
740										
40					737.1	S5	ROTO SONIC	0.17 0.17		
		40.00 - 42.00 Silty CLAY, some sand, transitioning from reddish-brown to brownish gray, w~PL, moderate plasticity, soft to firm, moist to wet, transition to PWR, cohesive	CL-ML		40.00					
735					735.1					
		Boring completed at 42.00 ft								
45										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: D. Thomas  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-78

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 30.00 ft  
LOCATION: South of road on north side of plant property

DRILL RIG: Rotosonic 1159  
DATE STARTED: 9/22/19  
DATE COMPLETED: 9/22/19

NORTHING: 1,394,328.20  
EASTING: 2,202,958.20  
GS ELEVATION: 787.79  
TOC ELEVATION: 790.75 ft

DEPTH W.L.: 9.05  
ELEVATION W.L.: 778.95  
DATE W.L.: 1/13/2020  
TIME W.L.: 13:44

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/22/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 8.70 Hydrovac				0		0.00 0.73	Concrete Surface Completion	<b>WELL CASING</b> Interval: 0.0 - 29.0' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 20.0-29.5' Material: Schedule 40 PVC Schedule 40 PVC Diameter: 2" ID 4" OD Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 17.5 - 30.0 Type: 20/40 FilterSil  <b>FILTER PACK SEAL</b> Interval: 9.0 - 17.5' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0.4 - 9.0' Type: Baroid 3/8" Bentonite Chips (Holeplug)  <b>WELL COMPLETION</b> Pad: 4' x 4' x 4" Protective Casing: 4" Stainless Steel  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic  ~250 gallons of water used while drilling
785									Baroid 3/8" Bentonite Chips (Holeplug)	
5										
780					779.1					
		8.70 - 11.20 (MLS) sandy SILT, low plasticity fines, fine to medium sub-angular sand, trace organics (roots); light brown (5YR 5/6) to Pale Brown (5YR 2/2), residual soil with frequent micaceous minerals present; cohesive, w-PL, soft	MLS		8.70	1	ROTO SONIC	0.94 0.94		
10					776.6					
		11.20 - 17.00 (MLS) sandy SILT, non to low plasticity fines, fine sub-angular sand, trace soft (crumbles with pressure from fingers) gravels with relic foliations; pale yellowish brown (10YR 6/2) with light gray (N7) and dark yellowish brown (10YR 4/2) foliations, highl	MLS		11.20				Pel-Plug 3/8" Bentonite Pellets	
775										
15					770.8					
		17.00 - 25.10 (SM) SILTY SAND, fine sub-angular to sub-rounded sand, non-plastic fines, trace fine angular soft (crumbles with pressure from fingers) with relic foliations; pale yellowish brown (10YR 6/2) with very pale orange (10YR 8/2) and dark yellowish brown (10YR	SM		17.00	2	ROTO SONIC	0.18 0.42	20/40 FilterSil Sandpack	
20										
765										
		25.10 - 30.00 BEDROCK, GNEISS, slightly to moderately weathered (W2 - W3), medium dark gray (N4), with light bluish gray (5B 5/1) and light gray (N7) foliations, fine to medium grained, medium strong rock (R3)	GNEISS		762.7 25.10	3	ROTO SONIC	0.31 0.42	2"ID, 4"OD 0.010 Slot SCH 40 PVC U-Pack Screen	
25										
760					757.8				PVC Cap	
30		Boring completed at 30.00 ft								
755										
35										
750										
40										
745										
45										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: Jeff Ingram  
CHECKED BY: Timothy Richards, PG  
DATE: 2/12/20





## SHEET 1 of 1

DEPTH W.L.: 5.92  
ELEVATION W.L.: 779.98  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:26

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS				
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	REC						
					DEPTH (ft)								
0	785	0.00 - 9.20 Hydrovac	NA			0		0.00 0.77	Concrete Surface / Completion		<b>WELL CASING</b> Interval: 0.0 - 34.9 ' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw		
5	780												
10	775	9.20 - 13.70 (ML) sandy SILT, non to low plasticity fines, fine sand; layered light brown (5YR 5/6) with dark yellowish brown (10YR 4/2) and pale yellowish brown (10YR 6/2) layers, some relic curved laminated layers (relic foliations); non-cohesive, wet, loose	ML		776.6 9.20					Baroid 3/8 " Bentonite Chips (Holeplug)	<b>FILTER PACK</b> Interval: 22.0 - 35.0' Type: 20/40 FilterSil		
15	770	13.70 - 30.00 (SM) silty SAND, fine sub-angular sand, non-plastic fines, some soft (crumbles with pressure from fingers) fine to coarse sub-angular gravels; pale yellowish brown (10YR 6/2) with some light brown (5YR 5/6) iron oxide staining, PWR with frequent micaceous mineral; non-cohesive, wet, loose	SM		772.1 13.70	1	ROTO SONIC	0.77 10.80				<b>FILTER PACK SEAL</b> Interval: 14.0 - 22.0' Type: Pel-Plug 3/8" Bentonite Pellets	
20	765												<b>ANNULUS SEAL</b> Interval: 0.4 - 14.0 ' Type: Baroid 3/8" Bentonite Chips (Holeplug)
25	760												<b>WELL COMPLETION</b> Pad: Protective Casing: 4" Stainless Steel
30	755	30.00 - 35.00 (SM) SILTY SAND, fine sub-angular sand, non-plastic fines, trace soft (crumbles with pressure from fingers) fine gravels with some relic foliations; pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2) layers, PWB; non-cohesive, moist, compact					755.8 30.00	4	ROTO SONIC	0.38 0.42			<b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic
35	750	Boring completed at 35.00 ft					750.8						~175 gallons of water used while drilling
40	745												
45													

GA INSPECTOR: Jeff Ingram  
CHECKED BY: Timothy Richards, PG  
DATE: 2/12/20



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20



# RECORD OF BOREHOLE B-80

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 30.00 ft  
LOCATION: North to northeast of CCR Unit

DRILL RIG: Rotosonic 1159  
DATE STARTED: 9/20/19  
DATE COMPLETED: 9/20/19

NORTHING: 1,394,372.60  
EASTING: 2,203,533.90  
GS ELEVATION: 801.73  
TOC ELEVATION: 804.47 ft

DEPTH W.L.: 16.48  
ELEVATION W.L.: 785.32  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:46

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 8.70 Hydrovac	NA			0		0.00 0.73	Concrete Surface Completion	<b>WELL CASING</b> Interval: 0.0 - 19.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 19.8-29.3' Material: Schedule 40 PVC Schedule 40 PVC Diameter: 2" ID 4" OD Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 17.5 - 30.0' Type: 20/40 FilterSil  <b>FILTER PACK SEAL</b> Interval: 9.0 - 17.5' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0.4 - 9.0' Type: High Solids Bentonite (AquaGuard)  <b>WELL COMPLETION</b> Pad: 4' x 4' x 4" Protective Casing: 4" Stainless Steel  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic  ~150 gallons of water used while drilling
800									High Solids Bentonite (AquaGuard)	
5										
795					793.0					
		8.70 - 10.00 (ML) sandy SILT, non-plastic to low plasticity fines, fine to medium sub-rounded sand, trace organics (roots); moderate brown (5YR 4/4) to pale yellowish brown (10YR 6/2); non-cohesive, dry, loose	ML		8.70	1	ROTO SONIC	0.11 0.11		
10		10.00 - 13.20 (ML and SP) SILT and SAND, non-plastic to low plasticity fines, fine sub-angular sand; light brown (5YR 5/6) with some moderate reddish brown (10R 4/6) layers, some laminated layers (relic foliations), SAPROLITE; non-cohesive, moist, loose	ML & SP		791.7 10.00	2	ROTO SONIC	0.81 0.83	Pel-Plug 3/8" Bentonite Pellets	
790					788.5					
		13.20 - 25.90 (SM) SILTY SAND, non-plastic to low plasticity fines, fine sub-angular sand; light brown (5YR 5/6) and pale yellowish brown (10YR 6/2) with trace very pale orange (10YR 8/1) grains, SAPROLITE; non-cohesive, wet, loose	SM SM		13.20					
15									20/40 FilterSil Sandpack	
785										
		20.00: SAA, with frequent weathered micaceous minerals				3	ROTO SONIC	0.83 0.83		
20										
780										
					775.8					
25		25.90 - 30.00 (SM-SP) SAND, fine to medium sub-rounded sand, some non-plastic fines, trace angular fine to coarse soft (crumbles with pressure from fingers) gravels; very pale orange (10YR 8/2) with pale yellowish brown (10YR 6/2) mottling, PWR; non-cohesive, moist to wet, compact	SP-SM		25.90				2"ID, 4"OD 0.010 Slot SCH 40 PVC U-Pack Screen	
775										
		Boring completed at 30.00 ft			771.7				PVC Cap	
30										
770										
35										
765										
40										
760										
45										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: Jeff Ingram  
CHECKED BY: Timothy Richards, PG  
DATE: 2/12/20





# RECORD OF BOREHOLE B-81

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: North to northeast of CCR Unit

DRILL RIG: Rotosonic 1159  
DATE STARTED: 9/20/19  
DATE COMPLETED: 9/22/19

NORTHING: 1,394,364.90  
EASTING: 2,203,741.10  
GS ELEVATION: 817.64  
TOC ELEVATION: 820.56 ft

DEPTH W.L.: 31.39  
ELEVATION W.L.: 786.31  
DATE W.L.: 1/13/2020  
TIME W.L.: 15:06

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC					
					DEPTH (ft)								
0		0.00 - 9.00 Hydrovac	NA			0		0.00 0.75	Concrete Surface Completion		<b>WELL CASING</b> Interval: 0.0 - 39.17' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 39.17 - 49.17' Material: 39.17 - 49.17' Diameter: 2" ID 4 " OD Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 37.0 - 50.0' Type: 20/40 FilterSil  <b>FILTER PACK SEAL</b> Interval: 17.0 - 37.0' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0.4 - 17.0' Type: High Solids Bentonite (Aquagard)  <b>WELL COMPLETION</b> Pad: 4' x 4' x 4" Protective Casing: 4" Stainless Steel  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic  ~150 gallons of water used while drilling		
815													
5													
810													
10		9.00 - 13.10 (SM) SILTY SAND, fine to medium sub-rounded sand, non-plastic fines, trace organics (roots); light brown (5YR 5/6) and moderate reddish brown (10R 4/6), SAPROLITE; non-cohesive, dry, compact	SM		808.6 9.00	1	ROTO SONIC	0.91 0.92	High Solids Bentonite (Aquagard)				
805					804.5								
15		13.10 - 17.90 (SM) SILTY SAND, fine sub-rounded sand, non-plastic fines; very pale orange (10YR 8/2) to grayish orange (10YR 7/6), PWR with frequent micaceous mineralization; non-cohesive, dry, loose	SM		13.10							Cave in prior to installing Aquagard due to sampling requirements	
800					799.7								
20		17.90 - 19.00 (ML and SP) SILT and SAND, non-plastic fine, fine to medium sub-rounded sand; light brown (5YR 5/6), PWR; non-cohesive, dry, compact.	ML & SP		17.90 798.6 19.00		ROTO SONIC						
795		19.00 - 23.50 (SP-SM) SAND, fine to medium sub-rounded sand, some non-plastic fines; grayish orange (10YR 7/4) with light brown (5YR 5/6) and dark yellowish brown (10YR 2/2) grains, PWR; non-cohesive, dry, compact 20.00: SAA with some pale reddish brown (10R 5/6) coloration	SP-SM  SP-SM			2	ROTO SONIC	0.83 0.83					
25		23.50 - 33.60 (ML) sandy SILT, non-plastic to low plasticity fines, fine sub-angular sand; pale yellowish brown (10YR 6/2) to light brown (5YR 5/6), PWR; non-cohesive, moist, loose	ML		794.1 23.50				Pel-Plug 3/8" Bentonite Pellets				
790													
30		30.00: SAA wit some greenish gray (5G 6/1) layers, trace fine soft angular gravels (crumble with finger pressure).			ML			3		ROTO SONIC	0.83 0.83		
785													
35		33.60 - 40.00 (SM and SP) SILT and SAND, non-plastic to low plasticity fines, fine sub-rounded sand, trace sub-angular soft (crumbles with finger pressure) gravels; yellowish gray (5YR 8/1) to pale pink (5RP 8/2) to greenish gray (5G 6/1), very micaceous, PWR; non-cohesive, moist, loose	ML & SP		784.0 33.60				Backfill  20/40 FilterSil Sandpack				
780													
40		40.00 - 41.30 (ML and SP) SILT and SAND, non-plastic to low plasticity fines, fine to medium sub-rounded sand; grayish orange (10YR 7/6) to light olive gray (5Y 5/2), highly weathered with some relic foliation layers, PWR; non-cohesive, moist, compact	ML & SP		777.6 40.00 776.3 41.30	4	ROTO SONIC	0.83 0.83					
775		41.30 - 45.40 (SP and ML) SAND and SILT, fine sand, non-plastic fines; yellowish gray (5Y 8/1), very micaceous, PWR; non-cohesive, moist, loose	SP & ML							2"ID, 4"OD 0.010 Slot			
45		Log continued on next page											

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/22/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: Jeff Ingram  
CHECKED BY: Timothy Richards, PG  
DATE: 2/12/20









# RECORD OF BOREHOLE B-82

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 45.00 ft  
LOCATION: East of CCR Unit south of concrete plant

DRILL RIG: Rotasonic 1159  
DATE STARTED: 9/21/19  
DATE COMPLETED: 9/21/19

NORTHING: 1,393,750.00  
EASTING: 2,204,258.10  
GS ELEVATION: 807.55  
TOC ELEVATION: 810.07 ft

DEPTH W.L.: 8.90  
ELEVATION W.L.: 798.6  
DATE W.L.: 1/13/2020  
TIME W.L.: 15:59

BOREHOLE RECORD MCDONOUGH MASTER LIST - BACKUP - SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/22/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC					
					DEPTH (ft)								
0		0.00 - 8.70 Hydrovac	NA			0		0.00 0.73	Concrete Surface / Completion		<b>WELL CASING</b> Interval: 0.0 - 34.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 34.5 - 44.5' Material: Schedule 40 PVC Schedule 40 PVC Diameter: 2" ID 4 " OD Slot Size: 0.010 End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32.5 - 45.0' Type: 20/40 FilterSil  <b>FILTER PACK SEAL</b> Interval: 26.5 - 32.5' Type: Pel-Plug 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0.4 - 26.5' Type: High Solids Bentonite (Aquagaurd)  <b>WELL COMPLETION</b> Pad: 4' x 4' x 4" Protective Casing: 4" Stainless Steel  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic  ~200 gallons of water used while drilling		
805													
5													
800					798.9		ROTO SONIC		High Solids Bentonite – (Aquagaurd)				
		8.70 - 10.70 (ML) sandy SILT, non-plastic fines, fine sand; dark yellowish brown (10YR 4/2); non-cohesive, dry, loose	ML		8.70	1		0.94 0.94					
10					796.9								
		10.70 - 31.70 (SM) sandy SILT, fine to medium angular sand, non-plastic to low plasticity fines, some soft (crumble under finger pressure) fine angular gravel; dark yellowish brown (10YR 4/2) to pale yellowish brown (10YR 6/2), very micaceous, SAPROLITE; non-cohesive, dry, loose. Moist and compact starting at 20 feet bgs.	ML		10.70				Pel-Plug 3/8" Bentonite – Pellets				
795													
15													
790							ROTO SONIC		Pel-Plug 3/8" Bentonite – Pellets				
20						2		0.83 0.83					
785													
25							ROTO SONIC		20/40 FilterSil – Sandpack				
780					775.9								
30					31.70								
		31.70 - 35.50 (SP and ML) SAND and SILT, fine sub-angular sand, non-plastic to low plasticity fines; dark yellowish brown (10YR 4/2), highly micaceous, SAPROLITE; non-cohesive, wet, compact	SP & ML					0.83 0.83	2"ID, 4"OD 0.010 Slot SCH 40 PVC – U-Pack Screen				
775					772.1								
35					35.50								
		35.50 - 38.50 (CL) sandy SILTY CLAY, low to moderate plasticity fines, fine sand; moderate yellowish brown (10YR 4/2) to light brown (5YR 5/6), some relic foliations, highly micaceous, SAPROLITE; cohesive, w>PL, soft.	CL						PVC Cap –				
770					769.1								
40		38.50 - 40.00 (SC) CLAYEY SAND, fine angular sand, low to moderate plasticity fines; light brown (5YR 5/6) to moderate yellowish brown (10YR 5/4), iron oxide staining, very micaceous, some relic foliations, SAPROLITE; non-cohesive, wet, compact	SC		38.50			0.42 0.42					
		40.00 - 45.00 (ML and SP) SILT and SAND, non-plastic to low plasticity fines, fine sand; dark yellowish brown (10YR 4/2) with frequent relic foliations, very micaceous, SAPROLITE; non-cohesive, wet to moist, compact	ML & SP		767.6	4	ROTO SONIC						
765							40.00						
45		Boring completed at 45.00 ft				762.6							

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Jose

GA INSPECTOR: Jeff Ingram  
CHECKED BY: Timothy Richards, PG  
DATE: 2/12/20





# RECORD OF BOREHOLE B-83

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: South by river, NW of B-76

DRILL RIG: CME550X  
DATE STARTED: 9/30/19  
DATE COMPLETED: 9/30/09

NORTHING: 1,390,735.50  
EASTING: 2,202,695.60  
GS ELEVATION: 777.17  
TOC ELEVATION: 776.98 ft

DEPTH W.L.: 28.75  
ELEVATION W.L.: 748.35  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:52

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
					DEPTH (ft)							
0		0.00 - 15.00 Hydrovac to 15' for utilities									AquaGuard Bentonite – Grout	<b>WELL CASING</b> Interval: 0'-38.6' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 38.6'-48.6' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 36.6'-50' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 30.7'-36.6' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-30.7' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow-Stem Auger Rock Drill: N/A
775												
5												
770												
10												
765												
15		15.00 - 19.00 ML, Gravelly SILT with some sand, brown-black, cohesive, W<PL, dry, soft	ML		762.2 15.00							
760												
20		19.00 - 20.00 ML, SILT, micaceous, brown, W<PL, moist, very soft	ML		758.2 19.00	S1	SS	6-4-4	8	1.25 1.50		
755		20.00 - 33.50 ML, SILT, brown, moist, W-PL, firm to stiff			757.2 20.00							
25			ML			S2	SS	2-1-3	4	1.50 1.50		
750												
30						S3	SS	1-1-2	3	1.50 1.50		
745												
35		33.50 - 38.50 CL, silty CLAY, micaceous, dark brown-tan, cohesive, moist, W>PL, very soft to soft	CL		743.7 33.50	S4	SS	1-1-2	3	1.50 1.50	PEL-PLUG 3/8" – Bentonite Pellets	
740												
40		38.50 - 43.50 CL, silty CLAY, brown with black and red, W>PL, very soft to soft	CL		738.7 38.50	S5	SS	3-3-4	7	1.50 1.50	#2 FilterSil –	
735												
45		43.50 - 49.00 CL, silty CLAY, brown with orange, moist to wet, W<PL, very soft to firm Log continued on next page	CL-ML		733.7 43.50	S6	SS	WOH-4-8	12	1.50 1.50	0.010" Slotted	

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: K. Minkara  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-83


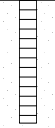

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: South by river, NW of B-76

DRILL RIG: CME550X  
DATE STARTED: 9/30/19  
DATE COMPLETED: 9/30/09

NORTHING: 1,390,735.50  
EASTING: 2,202,695.60  
GS ELEVATION: 777.17  
TOC ELEVATION: 776.98 ft

DEPTH W.L.: 28.75  
ELEVATION W.L.: 748.35  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:52

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		43.50 - 49.00 CL, silty CLAY, brown with orange, moist to wet, W<PL, very soft to firm (Continued)	CL-ML								Schedule 40 PVC 	<b>WELL CASING</b> Interval: 0'-38.6' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 38.6'-48.6' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 36.6'-50' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 30.7'-36.6' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-30.7' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow-Stem Auger Rock Drill: N/A
50		49.00 - 50.00 SM, silty SAND, PWR, black-brown mica schist  Boring completed at 50.00 ft	SM		728.2 49.00 727.2	S7	SS	8-15-18	33	1.50 1.50		
55												
60												
65												
70												
75												
80												
85												
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: K. Minkara  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-84

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: NE of security gate, along road

DRILL RIG: CME550X  
DATE STARTED: 10/1/19  
DATE COMPLETED: 10/1/19

NORTHING: 1,390,411.90  
EASTING: 2,202,241.90  
GS ELEVATION: 776.52  
TOC ELEVATION: 776.34 ft

DEPTH W.L.: 30.12  
ELEVATION W.L.: 746.48  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:32

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0	775	0.00 - 14.50 Hydrovac to 14.5' to for utilities								AquaGuard Bentonite - Grout	<b>WELL CASING</b> Interval: 0'-39.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 39.1'-49.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 36.0'-49.5' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 30.6'-36.0' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-30.6' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: N/A
5	770										
10	765										
15	760	14.50 - 20.00 ML-CL, silty CLAY with some gravel, brown-black, micaceous, W-PL, moist, very soft	CL-ML	762.0 14.50							
20	755	20.00 - 25.00 ML, sandy SILT with some gravel, brown-black, dry, W<PL, very soft	ML	756.5 20.00	S1	SS	3-1-2	3	0.75 1.50		
25	750	25.00 - 30.00 CL, silty CLAY with some gravel, brown-black, micaceous, W-PL, moist, very soft to soft	CL	751.5 25.00	S2	SS	3-2-3	5	0.75 1.50		
30	745	30.00 - 35.00 CL, silty CLAY with some sand, brown-black with tan, W-PL, moist	CL	746.5 30.00	S3	SS	1-2-3	5	1.50 1.50		
35	740	35.00 - 39.00 CL, silty CLAY, brown-black, W-PL, wet to moist	CL	741.5 35.00	S4	SS	2-2-3	5	1.50 1.50	PEL-PLUG 3/8" - Bentonite Pellets	
40	735	39.00 - 40.00 SM, silty SAND with gravel, black-grey, moist, compact 40.00 - 44.00 CL, silty CLAY, brown-black, W-PL, moist, very soft to soft	SM CL	737.5 39.00 736.5 40.00	S5	SS	15-18-11	29	1.50 1.50	#2 FilterSil -	
45		44.00 - 45.00 ML, gravelly SILT with some sand, Log continued on next page	ML	732.5 44.00 731.5	S6	SS	7-7-8	17	1.50 1.50	0.010" Slotted	

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: K. Minkara  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-84

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 50.00 ft  
LOCATION: NE of security gate, along road

DRILL RIG: CME550X  
DATE STARTED: 10/1/19  
DATE COMPLETED: 10/1/19

NORTHING: 1,390,411.90  
EASTING: 2,202,241.90  
GS ELEVATION: 776.52  
TOC ELEVATION: 776.34 ft

DEPTH W.L.: 30.12  
ELEVATION W.L.: 746.48  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:32

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45		brown-black, micaceous, PWR, moist 45.00 - 50.00	ML		45.00						Schedule 40 PVC	<b>WELL CASING</b> Interval: 0'-39.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 39.1'-49.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 36.0'-49.5' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 30.6'-36.0' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-30.6' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: N/A
730		ML, sandy SILT with gravel, brown-black, PWR, W<PL, wet to moist, PWR, very dense				S7	SS	25-33-24	57	1.50 1.50		
50		Boring completed at 50.00 ft			726.5							
725												
55												
720												
60												
715												
65												
710												
70												
705												
75												
700												
80												
695												
85												
690												
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: K. Minkara  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-85

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 34.50 ft  
LOCATION: North of site, adjacent to B-54

DRILL RIG: CME 550  
DATE STARTED: 11/17/19  
DATE COMPLETED: 11/18/19

NORTHING: 1,394,433.40  
EASTING: 2,203,134.50 GS  
ELEVATION: 782.71 TOC  
ELEVATION: 782.54 ft

DEPTH W.L.: 2.27  
ELEVATION W.L.: 780.43  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:16

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)						
0		0.00 - 10.00 Hydrovac to 10.0' to for utilities								AquaGuard Bentonite – Grout	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div><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BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-86

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 34.10 ft  
LOCATION: North of site along fence adjacent to B-79

DRILL RIG: CME 550  
DATE STARTED: 11/18/19  
DATE COMPLETED: 11/18/20

NORTHING: 1,394,480.00  
EASTING: 2,203,206.60  
GS ELEVATION: 784.52  
TOC ELEVATION: 784.29 ft

DEPTH W.L.: 0.91  
ELEVATION W.L.: 783.69  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:54

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0		0.00 - 7.00 Hydrovac to 7.00' to for utilities									AquaGuard Bentonite – Grout	<b>WELL CASING</b> Interval: 0'-34.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen
5	780											
		7.00 - 18.50 No Recovery			777.5 7.00							<b>WELL SCREEN</b> Interval: 24.1'-34.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC
10	775											<b>FILTER PACK</b> Interval: 22.1'-34.1' Type: Filter Media
												<b>FILTER PACK SEAL</b> Interval: 17'-22.1' Type: PEL-PLUG 3/8"
15	770											<b>ANNULUS SEAL</b> Interval: 0.0'-17' Type: AquaGuard Bentonite Grout
												<b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush
		18.50 - 23.50 SM, silty SAND, white to black and brown, fine to medium sand, saprolite, non-cohesive, wet, compact			766.0 18.50	1	SS	5-10-14	24	1.00 1.50	PEL-PLUG 3/8" – Bentonite Pellets	<b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: HQ Core Barrell
20	765		SM									
		23.50 - 28.00 SW-SM, SAND with some silt and trace gravel, brown and white to black, saprolite, non-cohesive, wet, compact			761.0 23.50	2	SS	4-9-17	26	1.00 1.50	#2 FilterSil –	
25	760		SM									
		28.00 - 34.10 Bedrock, AUGEN GNEISS, white to black, fresh to slightly weathered, strong			756.5 28.00	3	CORE			4.00 5.00	0.010" Slotted Schedule 40 PVC	
30	755		GNEISS									
		Boring completed at 34.10 ft			750.4							
35	750											
40	745											
45	740											

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





## SHEET 1 of 1

DEPTH W.L.: 15.56  
ELEVATION W.L.: 784.84  
DATE W.L.: 1/13/2020  
TIME W.L.: 14:54

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-88

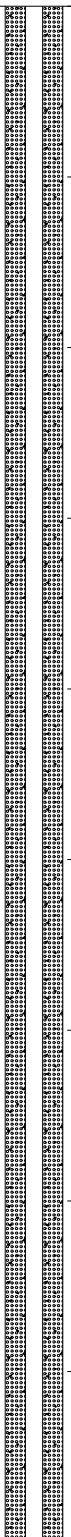






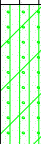

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 72.40 ft  
LOCATION: North end of site along fence

DRILL RIG: CME 550  
DATE STARTED: 11/15/19  
DATE COMPLETED: 11/15/19

NORTHING: 1,394,401.10  
EASTING: 2,203,738.30  
GS ELEVATION: 816.80  
TOC ELEVATION: 820.07 ft

DEPTH W.L.: 31.47  
ELEVATION W.L.: 785.53  
DATE W.L.: 1/13/2020  
TIME W.L.: 15:11

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
0		0.00 - 10.00 Hydrovac to 10.00' to for utilities									<div>AquaGuard Bentonite – Grout</div> 	<div><b>WELL CASING</b> Interval: 0'-72' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen</div> <div><b>WELL SCREEN</b> Interval: 62'-72' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</div> <div><b>FILTER PACK</b> Interval: 60'-72' Type: Filter Media</div> <div><b>FILTER PACK SEAL</b> Interval: 55'-60' Type: PEL-PLUG 3/8"</div> <div><b>ANNULUS SEAL</b> Interval: 0'-55' Type: AquaGuard Bentonite Grout</div> <div><b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush</div> <div><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: N/A</div>
815												
5												
810												
10		10.00 - 15.00 SM, silty SAND with trace gravel, white and orange, saprolite, non-cohesive, dry, loose	SM		806.8 10.00							
805						1	SS	6-5-2	7	1.50 1.50		
15		15.00 - 19.00 SM, silty SAND with trace gravel, white and orange, saprolite, non-cohesive, dry, loose	SM		801.8 15.00							
800												
20		19.00 - 20.00 CL-ML, silt CLAY with some sand, brown, W<PL, firm	CL-ML		797.8 19.00 796.8 20.00	2	SS	7-5-2	7	1.50 1.50		
795		20.00 - 25.00 SM, silty SAND with some clay, fine to medium sand, orange and tan, low to no plasticity, W<PL, firm, cohesive			SM							
25		25.00 - 30.00 SM, silty SAND with some clay, fine to medium sand, orange and tan with white, saprolite, low to no plasticity, W<PL, firm, cohesive	SM			791.8 25.00		SS	2-5-3	8		
790												
30		30.00 - 34.00 SM, silty SAND with some clay, fine to medium sand, orange to tan with brown, saprolite, low to no plasticity, W<PL, firm, cohesive	SM		786.8 30.00		SS	2-2-5	7	1.50 1.50		
785												
35		34.00 - 35.00 SM, silty SAND with some clay, fine sand, white, gneissic saprolite, non-cohesive, dense, dry	SM		782.8 34.00 781.8 35.00	5	SS	5-13-20	33	1.50 1.50		
780		35.00 - 40.00 SM, silty SAND, white and grey, fine to medium sand, saprolite, dry, dense			SM							
40		40.00 - 44.40 ML, clayey SILT with trace sand and gravel, grey and brown some orange, saprolite, W<PL, very dense	ML			776.8 40.00		SS	13-25-26	51		
775												
45		Log continued on next page	SP		772.4 44.40	7	SS	13-50/4	<50	0.90 0.90		

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-88


SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 72.40 ft  
LOCATION: North end of site along fence

DRILL RIG: CME 550  
DATE STARTED: 11/15/19  
DATE COMPLETED: 11/15/19

NORTHING: 1,394,401.10  
EASTING: 2,203,738.30  
GS ELEVATION: 816.80  
TOC ELEVATION: 820.07 ft

DEPTH W.L.: 31.47  
ELEVATION W.L.: 785.53  
DATE W.L.: 1/13/2020  
TIME W.L.: 15:11

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
45	770	44.40 - 48.80 SP, SAND with some gravel, fine to coarse sand, PWR, moist, very dense. PWR at 48.50 feet bgs. (Continued)	SP									<b>WELL CASING</b> Interval: 0'-72' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen
					768.0 48.80	8	S	50/4	<50	0.30 0.30		<b>WELL SCREEN</b> Interval: 62'-72' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC
50	765	48.80 - 54.40 SP, SAND with some gravel, fine to coarse sand, PWR, moist, very dense	SP									<b>FILTER PACK</b> Interval: 60'-72' Type: Filter Media
					762.4 54.40	9	S	33-50/3	<50	0.90 0.90		<b>FILTER PACK SEAL</b> Interval: 55'-60' Type: PEL-PLUG 3/8"
55	760	54.40 - 59.40 SP, SAND with some silt and gravel, white and orange, fine to coarse sand, saprolite, PWR, moist to wet, very dense	SP-SM									<b>ANNULUS SEAL</b> Interval: 0'-55' Type: AquaGuard Bentonite Grout
					757.4 59.40	10	S	23-50/4	<50	0.90 0.90		<b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush
60	755	59.40 - 63.80 SP, SAND with some silt and gravel, white and orange, fine to coarse sand, saprolite, PWR, moist to wet, very dense	SP-SM									<b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: N/A
					753.0 63.80	11	S	50/3	<50	0.30 0.30		
65	750	63.80 - 69.00 SP, SAND with some silt and gravel, white and orange, fine to coarse sand, saprolite, PWR, wet, very dense	SP-SM									
					747.8 69.00	12	S	38-50/1	<50	0.50 0.50		
70		Boring completed at 72.40 ft										
75												
740												
80												
735												
85												
730												
90												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





## SHEET 1 of 2

DEPTH W.L.: 21.78  
ELEVATION W.L.: 800.82  
DATE W.L.: 1/13/2020  
TIME W.L.: 16:36

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-89


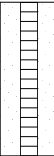
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 49.50 ft  
LOCATION: North of site in cement plant lot, next to retaining wall

DRILL RIG: CME 550  
DATE STARTED: 11/19/19  
DATE COMPLETED: 11/19/19

NORTHING: 1,394,398.40  
EASTING: 2,204,049.40  
GS ELEVATION: 822.53  
TOC ELEVATION: 822.36 ft

DEPTH W.L.: 21.78  
ELEVATION W.L.: 800.82  
DATE W.L.: 1/13/2020  
TIME W.L.: 16:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop			N-VALUE	REC
					DEPTH (ft)							
45		44.00 - 49.50 Bedrock, SCHIST, light grey to dark grey, fresh to slightly weathered, strong to very strong <i>(Continued)</i>								<div>Schedule 40 PVC</div> 	<b>WELL CASING</b> Interval: 0'-49.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screen  <b>WELL SCREEN</b> Interval: 39.5'-49.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 33.5'-49.5' Type: Filter Media  <b>FILTER PACK SEAL</b> Interval: 28.5'-33.5' Type: PEL-PLUG 3/8"  <b>ANNULUS SEAL</b> Interval: 0'-28.5' Type: AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2' x 2' concrete Protective Casing: 8" Round Ground Flush  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Auger Rock Drill: HQ Core Barrell	
775												
50		Boring completed at 49.50 ft			773.0							
770												
55												
765												
60												
760												
65												
755												
70												
750												
75												
745												
80												
740												
85												
735												
90												

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-90

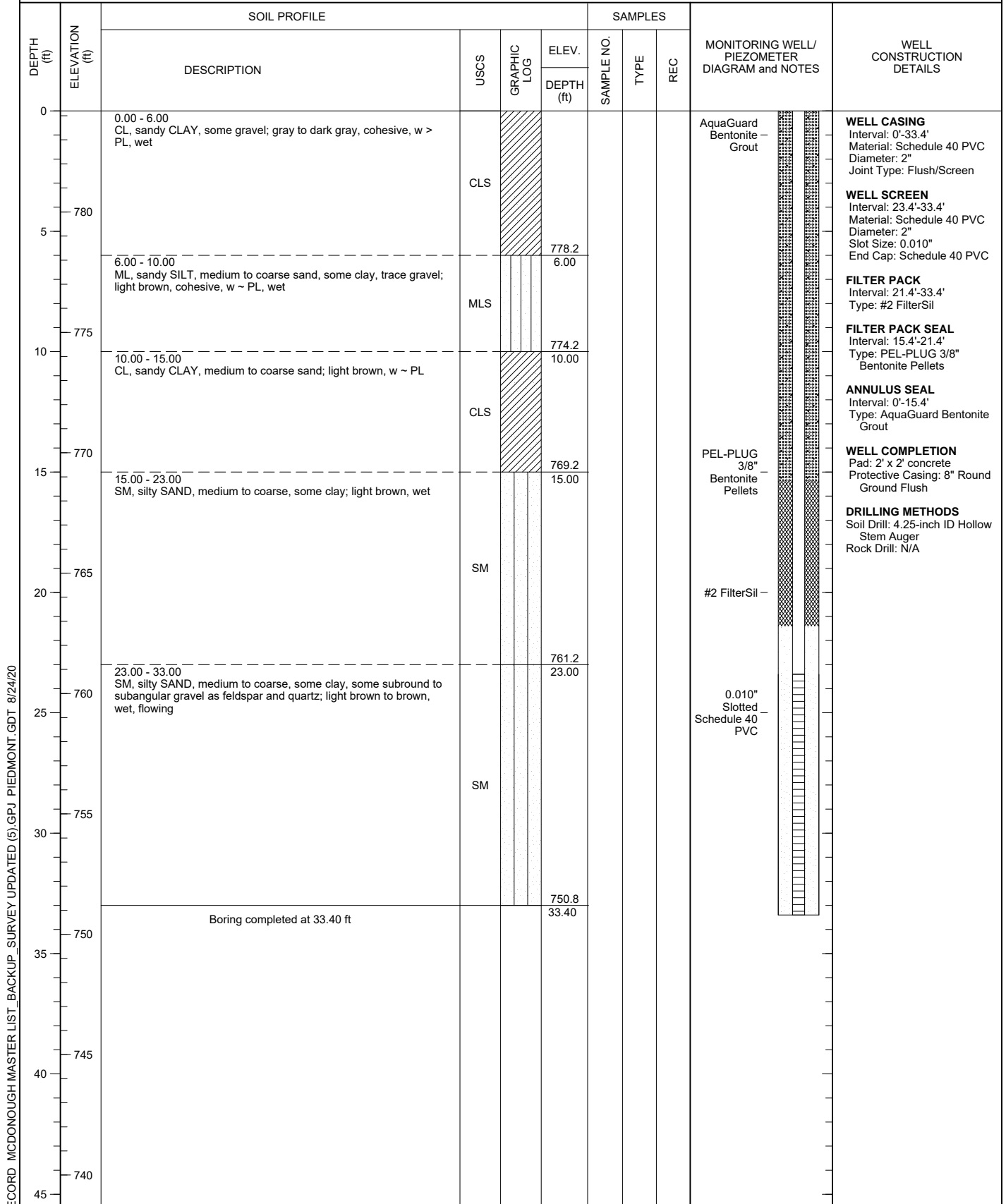
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 33.40 ft  
LOCATION: North of site along Plant Atkinson Road

DRILL RIG: CME 550  
DATE STARTED: 12/10/19  
DATE COMPLETED: 12/10/19

NORTHING: 1,394,501.00  
EASTING: 2,203,212.60  
GS ELEVATION: 784.16  
TOC ELEVATION: 784.00 ft

DEPTH W.L.: 0.88  
ELEVATION W.L.: 783.32  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:32



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-91

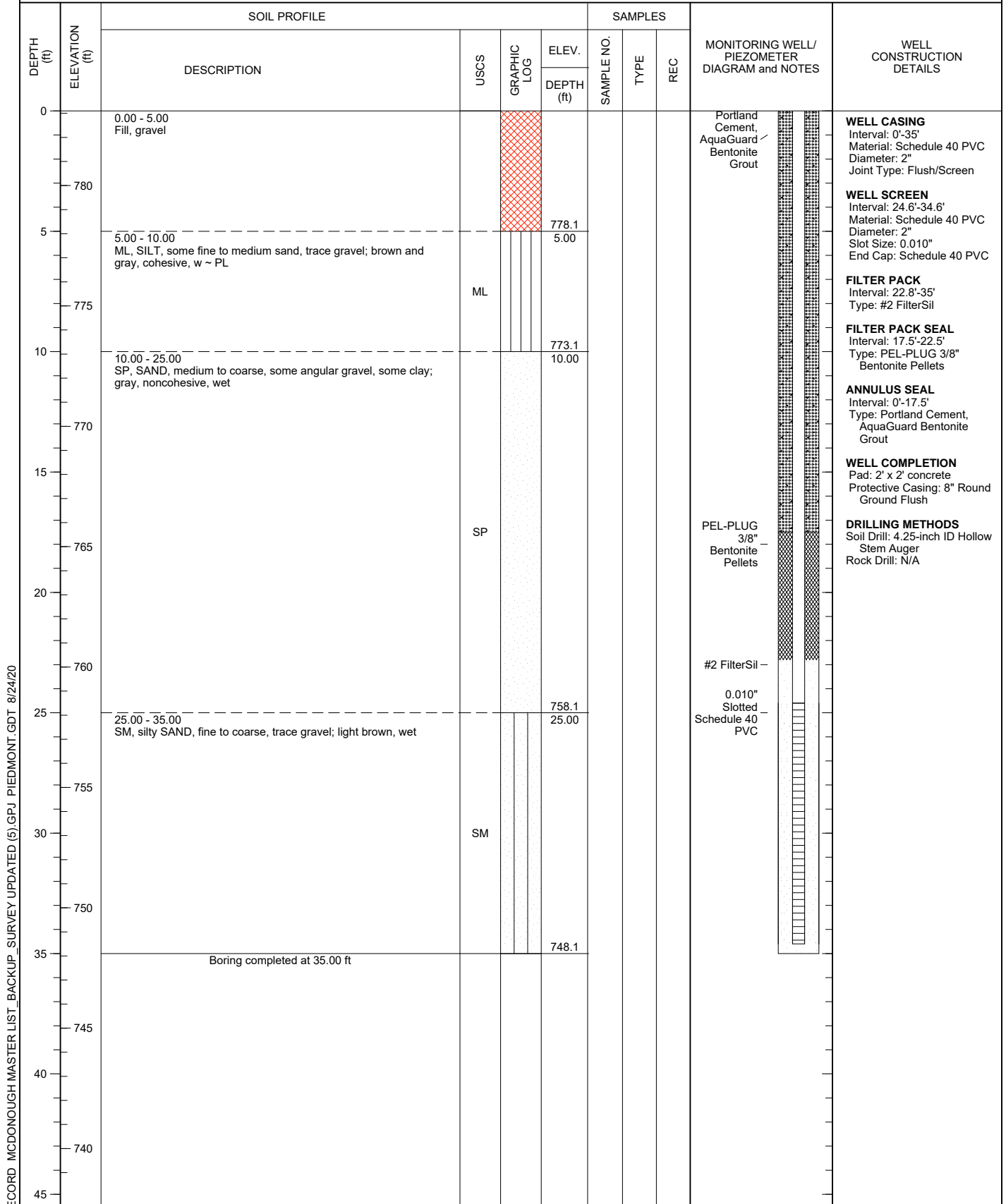
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 35.00 ft  
LOCATION: North of site along Plant Atkinson Road

DRILL RIG: CME 550  
DATE STARTED: 12/11/19  
DATE COMPLETED: 12/11/19

NORTHING: 1,394,447.10  
EASTING: 2,203,123.90  
GS ELEVATION: 783.10  
TOC ELEVATION: 782.98 ft

DEPTH W.L.: 2.90  
ELEVATION W.L.: 780.2  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:34



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-92

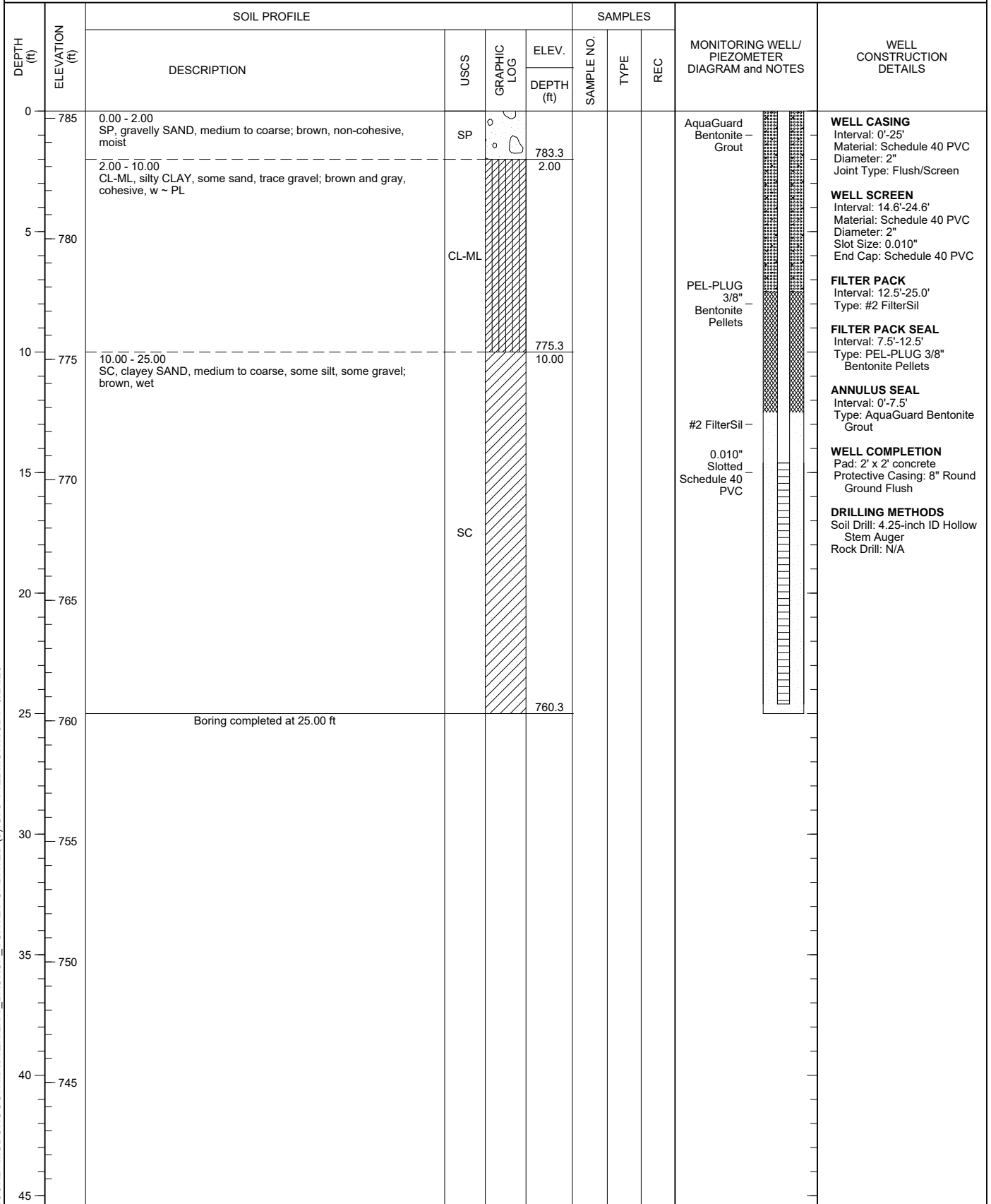
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 25.00 ft  
LOCATION: North of site along Plant Atkinson Road

DRILL RIG: CME 550  
DATE STARTED: 12/11/19  
DATE COMPLETED: 12/11/19

NORTHING: 1,394,392.70  
EASTING: 2,203,026.70  
GS ELEVATION: 785.30  
TOC ELEVATION: 785.08 ft

DEPTH W.L.: 3.88  
ELEVATION W.L.: 781.42  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:36



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-93

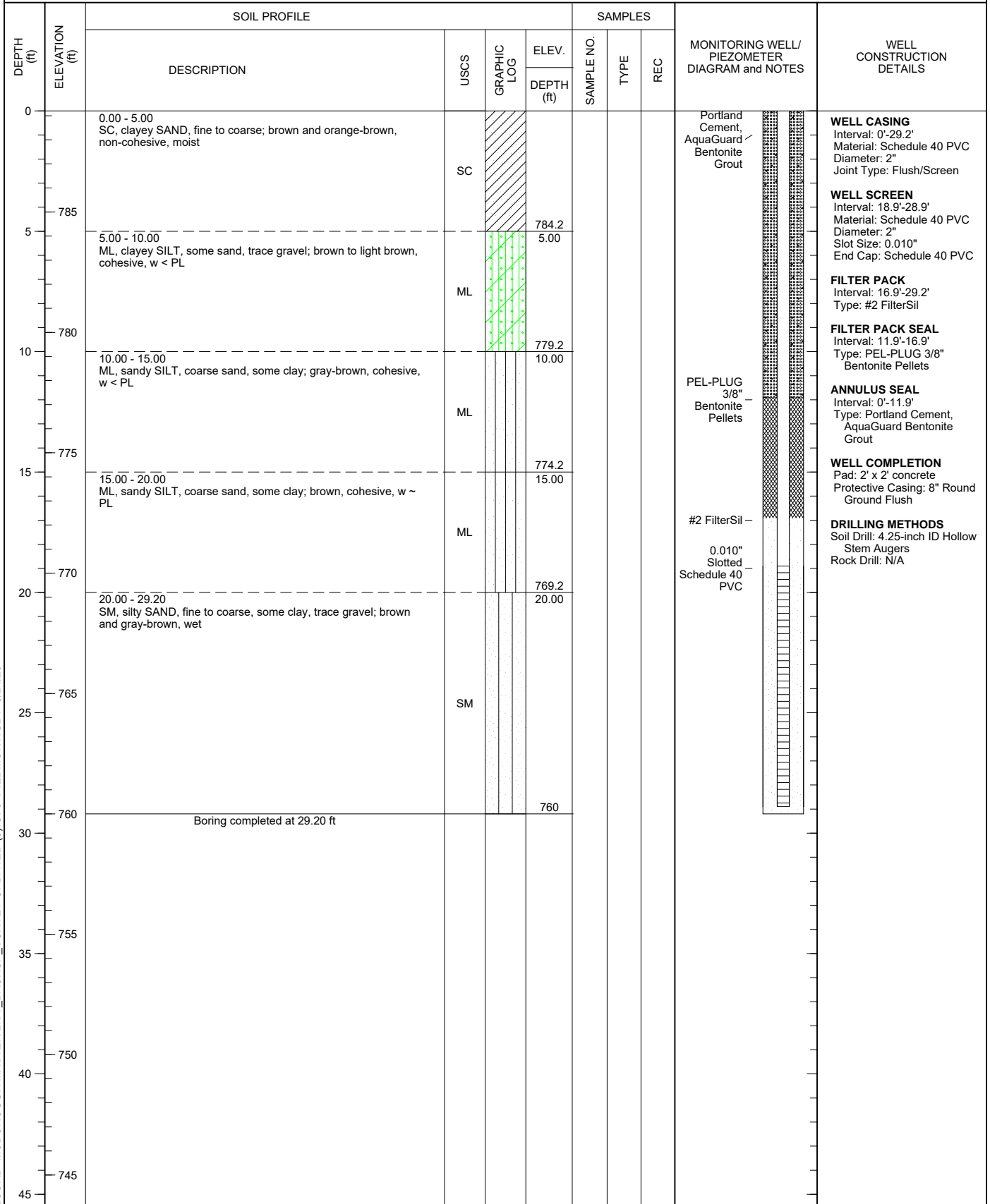
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 29.20 ft  
LOCATION: West of site on site along Plant Atkinson Road

DRILL RIG: CME 550  
DATE STARTED: 12/12/19  
DATE COMPLETED: 12/12/19

NORTHING: 1,394,348.70  
EASTING: 2,202,946.70  
GS ELEVATION: 789.19  
TOC ELEVATION: 789.07 ft

DEPTH W.L.: 4.86  
ELEVATION W.L.: 784.34  
DATE W.L.: 1/14/2020  
TIME W.L.: 12:38



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: W.Ballow  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-94

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 45.24 ft  
LOCATION: Northeast side, on property line

DRILL RIG: CME 550  
DATE STARTED: 1/21/20  
DATE COMPLETED: 1/23/20

NORTHING: 1,394,402.00  
EASTING: 2,203,513.70  
GS ELEVATION: 799.12  
TOC ELEVATION: 801.74 ft

DEPTH W.L.: 13.81 ft bTOC  
ELEVATION W.L.: 770.49  
DATE W.L.: 1/28/2020  
TIME W.L.: 16:44

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM AND NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 9.00 CL, silty CLAY, medium plasticity, some sand; reddish brown, cohesive, w > PL, soft	CL			S-01	GRAB			0.00 0.75		<b>WELL CASING</b> Interval: 0 ft-bgs - 45 ft-bgs Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush  <b>WELL SCREEN</b> Interval: 34.6 ft-bgs - 44.6 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32.5 ft-bgs - 44.6 ft-bgs Type: FilterSII Sand  <b>FILTER PACK SEAL</b> Interval: 28 ft-bgs - 32.5 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 28 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4' x 4' Concrete Pad Protective Casing: Aluminum Riser  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: N/A
795												
5												
790		9.00 - 13.50 ML, SILT, non-plastic, trace sand; orange-brown, micaceous, non-cohesive, moist, firm to stiff	ML		790.1 9.00	S-02	DO	2-2-4	6	1.50 1.50		
10												
785		13.50 - 45.24 SM, silty SAND, fine; mottled tan-brown and white, micaceous, saprolitic, non-cohesive, dry to moist, very dense	SM		785.6 13.50	S-03	DO	18-24-33	57	1.50 1.50		
15												
780		18.50: Compact				S-04	DO	6-10-20	30	1.50 1.50		
20												
775						S-05	DO	4-5-16	21	1.42 1.50		
25												
770		28.50: Trace quartz gravel from pegmatitic vein, dense				S-06	DO	21-24-22	46	1.08 1.50		
30		30.00: Trace quartz gravel, very dense				S-07	DO	10-50	50/4	0.83 0.83		
						S-08	DO	50	50/3	0.25 0.25		
						S-09	DO	50	50/5	0.42 0.42		
765						S-10	DO	50	50/4	0.33 0.33		
35						S-11	DO	50	50/3	0.58 0.25		
760		37.50: 1.0" pegmatitic vein consisting of potassium feldspar and plagioclase feldspar				S-12	DO	50	50/4	0.83 0.83		
40						S-13	DO	19-50	50/2	0.17 0.17		
		Log continued on next page										

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Heather Brissey & Michael Boatman PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-94

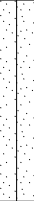
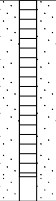
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 45.24 ft  
LOCATION: Northeast side, on property line

DRILL RIG: CME 550  
DATE STARTED: 1/21/20  
DATE COMPLETED: 1/23/20

NORTHING: 1,394,402.00  
EASTING: 2,203,513.70  
GS ELEVATION: 799.12  
TOC ELEVATION: 801.74 ft

DEPTH W.L.: 13.81 ft bTOC  
ELEVATION W.L.: 770.49  
DATE W.L.: 1/28/2020  
TIME W.L.: 16:44

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
40		13.50 - 45.24 SM, silty SAND, fine; mottled tan-brown and white, micaceous, saprolitic, non-cohesive, dry to moist, very dense (Continued) 42.00: Trace gravel	SM			S-14	DO	50	50/2	0.17 0.17		<b>WELL CASING</b> Interval: 0 ft-bgs - 45 ft-bgs Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush  <b>WELL SCREEN</b> Interval: 34.6 ft-bgs - 44.6 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32.5 ft-bgs - 44.6 ft-bgs Type: FilterSII Sand  <b>FILTER PACK SEAL</b> Interval: 28 ft-bgs - 32.5 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 28 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4' x 4' Concrete Pad Protective Casing: Aluminum Riser  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: N/A
						S-15	DO	8-26-50	76/10	0.83 0.83		
						S-16	DO	50	50/4	0.33 0.33		
45		Boring completed at 45.24 ft			753.9							
755												
750												
50												
745												
55												
740												
60												
735												
65												
730												
70												
725												
75												
720												
80												

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Heather Brissey & Michael Boatman PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/11/20





# RECORD OF BOREHOLE B-95

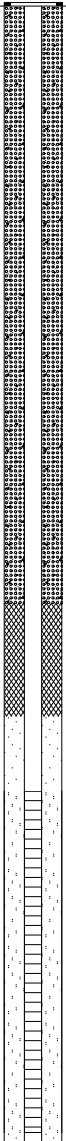
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 33.30 ft  
LOCATION: East of B-96

DRILL RIG: CME 550  
DATE STARTED: 2/11/20  
DATE COMPLETED: 2/11/20

NORTHING: 1,394,518.60  
EASTING: 2,203,167.70  
GS ELEVATION: 784.18  
TOC ELEVATION: 784.00 ft

DEPTH W.L.: 1.7 ft bTOC  
ELEVATION W.L.: 782.3  
DATE W.L.: 2/26/2020  
TIME W.L.: 13:49

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 10.00 Hydro Vac'd for utilities clearance									 <p>Bentonite Grout</p> <p>Bentonite Pellets</p> <p>Sand Filter Pack</p> <p>3" PVC 0.010 Slot U-Pack Screen</p>	<b>WELL CASING</b> Interval: 0 ft-bgs - 33.3 ft-bgs Material: PVC Diameter: 2" Joint Type: Flush  <b>WELL SCREEN</b> Interval: 23 ft-bgs - 33 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: 4"  <b>FILTER PACK</b> Interval: 20.8 ft-bgs - 33.3 ft-bgs Type: FilterSil Sand  <b>FILTER PACK SEAL</b> Interval: 17.5 ft-bgs - 20.5 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 17.5 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2'x2' Concrete Pad Protective Casing: 8" Round Flush Mount  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: N/A
780												
5												
775					774.2							
10					10.00							
770		13.50 - 33.30 SANDY SILT, low plasticity, fine grained sand; brown; non-cohesive, wet, loose			770.7	S-01	DO	3-3-4	7	N/A 1.50		
15												
765		18.50: SANDY SILT, low plasticity, fine grained sand; tan, orange, bronze, laminated, saprolite (gneiss parent rock), micaceous; non-cohesive, moist, very dense				S-02	DO	14-27-27	54	N/A 1.50		
20												
760		23.50: Trace fine gravel	ML			S-03	DO	8-50	50/5	N/A 0.92		
25												
755		28.50: Compact				S-04	DO	3-2-8	10	N/A 1.50		
30												
750		Boring completed at 33.30 ft			750.9							
35												
745												
40												
740												
45												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Heather Brissey  
CHECKED BY: Timothy Richards, PG  
DATE: 4/28/20





# RECORD OF BOREHOLE B-96


SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 33.10 ft  
LOCATION: North side of AP4

DRILL RIG: CME 550  
DATE STARTED: 2/10/20  
DATE COMPLETED: 2/10/20

NORTHING: 1,394,478.70  
EASTING: 2,203,099.30  
GS ELEVATION: 785.19  
TOC ELEVATION: 784.92 ft

DEPTH W.L.: 4.31 ft bTOC  
ELEVATION W.L.: 780.61  
DATE W.L.: 2/26/2020  
TIME W.L.: 15:14

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC			
					DEPTH (ft)								
0	785	0.00 - 10.00 Hydro Vac'd for utilities clearance											<b>WELL CASING</b> Interval: 0 ft-bgs - 33.1 ft-bgs Material: PVC Diameter: 2" Joint Type: Flush
5	780												<b>WELL SCREEN</b> Interval: 23.1 ft-bgs - 33.1 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: 4"
10	775				775.2 10.00								<b>FILTER PACK</b> Interval: 20 ft-bgs - 33.1 ft-bgs Type: FilterSil Sand
													<b>FILTER PACK SEAL</b> Interval: 15.8 ft-bgs - 20 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets
15	770	13.50 - 33.10 SILTY SAND, low to no plasticity; light grey, saprolitic (gneiss parent rock); non-cohesive, dry to moist, very dense			771.7 13.50	S-01	DO	50	50/5	0.17 0.50			<b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 15.8 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout
20	765					S-02	DO	4-50	50/3	0.50 1.00			<b>WELL COMPLETION</b> Pad: 2'x2' Concrete Pad Protective Casing: 8" Round Flush Mount
25	760	23.50: grey to tan	SM			S-03	DO	17-50	50/5	1.00 1.00			<b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: N/A
30	755	28.50: Iron staining				S-04	DO	5-26-50	76/11	1.30 1.50			
35	750	Boring completed at 33.10 ft			752.1								
40	745												
45													

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Michael Boatman PG  
CHECKED BY: Timothy Richards, PG  
DATE: 4/28/20





# RECORD OF BOREHOLE B-97

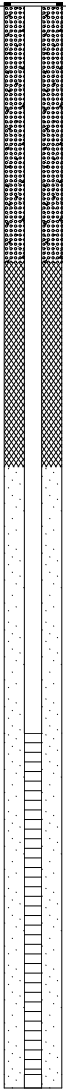
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 31.00 ft  
LOCATION: East of B-98

DRILL RIG: CME 550  
DATE STARTED: 2/11/20  
DATE COMPLETED: 2/11/20

NORTHING: 1,394,430.00  
EASTING: 2,203,008.30  
GS ELEVATION: 786.50  
TOC ELEVATION: 786.29 ft

DEPTH W.L.: 3.24 ft bTOC  
ELEVATION W.L.: 783.05  
DATE W.L.: 2/27/2020  
TIME W.L.: 10:54

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0	785	0.00 - 10.00 Hydro Vac'd for utilities clearance										<b>WELL CASING</b> Interval: 0 ft-bgs - 31.7 ft-bgs Material: PVC Diameter: 2" Joint Type: Flush  <b>WELL SCREEN</b> Interval: 21.3 ft-bgs - 31.3 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: 4"  <b>FILTER PACK</b> Interval: 13.5 ft-bgs - 21.3 ft-bgs Type: FilterSil Sand  <b>FILTER PACK SEAL</b> Interval: 7.5 ft-bgs - 13.5 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets  <b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 7.5 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 2'x2' Concrete Pad Protective Casing: 8" Round Flush Mount  <b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: HQ Core Barrel
5	780				776.5							
10	775				10.00							
15	770	13.50 - 16.00 gravelly SILTY SAND, no plasticity, medium grained sand, coarse gravel; tan to dark brown; non-cohesive, moist, compact	SM		773.0 13.50	S-01	OD	15-17-15	32	0.92 1.50		
20	765	16.00 - 31.70 Fresh, foliated, dark grey and white, fine to coarse grained, strong, GNEISS			770.5 16.00							
25	760										3" PVC 0.010 Slot U-Pack - Screen	
30	755	29.00: Slightly weathered, porous, medium strong										
35	750	Boring completed at 31.70 ft			754.8 31.70							
40	745											
45												

BOREHOLE RECORD MCDONOUGH MASTER LIST BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Southern Company Services  
DRILLER: S. Milam

GA INSPECTOR: Heather Brissey  
CHECKED BY: Timothy Richards, PG  
DATE: 4/28/20





# RECORD OF BOREHOLE B-98

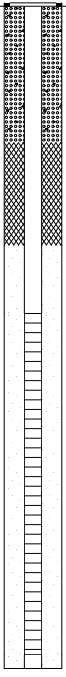
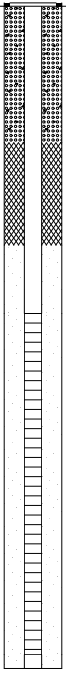
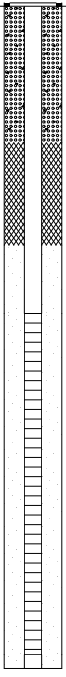
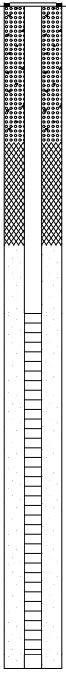
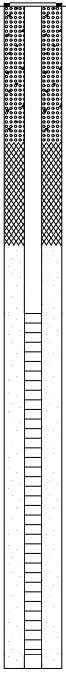
SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 19.40 ft  
LOCATION: West of B-97

DRILL RIG: Geoprobe 7822DT  
DATE STARTED: 2/10/20  
DATE COMPLETED: 2/10/20

NORTHING: 1,394,392.50  
EASTING: 2,202,934.00  
GS ELEVATION: 789.81  
TOC ELEVATION: 789.67 ft

DEPTH W.L.: 5.33 ft bTOC  
ELEVATION W.L.: 784.34  
DATE W.L.: 2/27/2020  
TIME W.L.: 10:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 10.00 Hydro Vac'd for utilities clearance								<b>WELL CASING</b> Interval: 0 ft-bgs - 19.4 ft-bgs Material: PVC Diameter: 2" Joint Type: Flush
5	785									<b>WELL SCREEN</b> Interval: 9 ft-bgs- 19 ft-bgs Material: Schedule 40 PVC Diameter: 3" Slot Size: 0.010" End Cap: 4"
10	780	10.00 - 19.40 Augered through with Geoprobe. No Soil data collected			779.8 10.00					<b>FILTER PACK</b> Interval: 7 ft-bgs - 9 ft-bgs Type: FilterSil Sand
15	775									<b>FILTER PACK SEAL</b> Interval: 4 ft-bgs - 7 ft-bgs Type: PEL-PLUG 3/8" Bentonite Pellets
20	770	Boring completed at 19.40 ft			770.4					<b>ANNULUS SEAL</b> Interval: 0 ft-bgs - 4 ft-bgs Type: Portland Cement, AquaGuard Bentonite Grout
25	765									<b>WELL COMPLETION</b> Pad: 2'x2' Concrete Pad Protective Casing: 8" Round Flush Mount
30	760									<b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID Hollow Stem Augers Rock Drill: N/A
35	755									
40	750									
45	745									

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: Cascade  
DRILLER: Eladio Gonzalaz

GA INSPECTOR: Heather Brissey  
CHECKED BY: Timothy Richards, PG  
DATE: 4/28/20



BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 8/24/20



# RECORD OF BOREHOLE B-99

SHEET 1 of 1

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 12.30 ft  
LOCATION: Smyrna, GA

DRILL RIG: CME 550X  
DATE STARTED: 7/7/20  
DATE COMPLETED: 7/7/20

NORTHING: 1,394,524.20  
EASTING: 2,203,084.50  
GS ELEVATION: 782.57  
TOC ELEVATION: 782.39 ft

DEPTH W.L.: 5.93  
ELEVATION W.L.: 776.46  
DATE W.L.: 7/7/20  
TIME W.L.: 16:10

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC		
					DEPTH (ft)					
0		0.00 - 5.00 GRAVEL WITH SILT; non-native, brown to brown-tan with some red, silty, poorly graded gravel with some concrete fill, some organics, slightly weathered, non-cohesive, moist to wet, loose to compact (fill)	GW-GM		777.6	R1		12.30	<div>Bentonite Grout</div> <div>Bentonite Pellets</div> <div>Sand Filter Pack</div> <div>3" PVC 0.010 Slot U-Pack Screen</div>	<b>WELL CASING</b> Interval: 0'-12'3" Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam  <b>WELL SCREEN</b> Interval: 7'3"-12'3" Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 5'-12'3" Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 3'-5' Type: 3/8" Coated Pel-Plug  <b>ANNULUS SEAL</b> Interval: 0'-3' Type: Aquagaurd Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Auger Rock Drill:
5		5.00 - 9.00 GRAVEL WITH SILT; non-native, brown to brown tan with red, silty, poorly graded gravel with some concrete fill, some organics, slightly weathered, non-cohesive, wet, loose to compact (fill)	GW-GM		5.00					
10		9.00 - 12.30 SILTY GRAVEL; brown, tan and red, non-cohesive, wet, loose to compact (mix of fill and saprolite)	GM		773.6 9.00					
770		Boring completed at 12.30 ft				770.3				
15										
765										
20										
760										
25										
755										
30										
750										
35										
745										
40										
740										
45										

LOG SCALE: 1 in = 5.5 ft  
DRILLING COMPANY: SCS CFS  
DRILLER: S. Deuty

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Brian Steele, PG  
DATE: 8/24/2020





# RECORD OF BOREHOLE B-100

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 44.80 ft  
LOCATION: Smyrna, GA

DRILL RIG: CME 550X  
DATE STARTED: 7/8/20  
DATE COMPLETED: 7/8/20

NORTHING: 1,390,254.80  
EASTING: 2,202,242.10  
GS ELEVATION: 775.32  
TOC ELEVATION: 777.95 ft

DEPTH W.L.: 34.78  
ELEVATION W.L.: 743.17  
DATE W.L.: 7/8/20  
TIME W.L.: 15:50

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC		
					DEPTH (ft)									
0	775	0.00 - 11.00 SILT-SILTY GRAVEL; mix of topsoil, residuum, fill, rip-rap boulders, soil; clayey silt, red-brown, micaceous, moist, moderately weathered, non-cohesive, moist, (backfilled cuttings)	ML-GM			R1	AUGER				Bentonite Grout	<b>WELL CASING</b> Interval: 0'-44'8" Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam  <b>WELL SCREEN</b> Interval: 34'8"-44'8" Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32'2"-44'8" Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 30'-32'2" Type: 3/8" Coated Pel-Plug  <b>ANNULUS SEAL</b> Interval: 2'-30' Type: Aquagaurd Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Auger Rock Drill:		
5	770													0.00 11.00
10	765													
15	760	13.50 - 15.00 SILT; with sand, gravel and trace clay, red-brown, highly weathered, non-cohesive, dry to moist, loose to compact	ML		764.3 11.00 761.8 13.50 760.3 15.00	R2	SS SS	3-3-2		1.45 1.50				
20	755	18.50 - 20.00 SILTY SAND; heavy organic matter (wood), red-brown with black organic matter, moderately weathered, non-cohesive, dry, loose	SM		756.8 18.50 755.3 20.00	R3	SS SS	3-3-2		0.60 1.50				
25	750	23.50 - 25.00 CLAYEY SAND; some organic matter, brown, slightly weathered, cohesive, w<PL, soft	SC		751.8 23.50 750.3 25.00	R4	SS SS	2-1-2		1.60 1.50				
30	745	28.50 - 30.00 CLAYEY SAND WITH SILT; trace organic matter, brown with some red, micaceous, moderately weathered, cohesive, w>PL, firm to soft, moist to wet	SC-SM		746.8 28.50 745.3 30.00	R5	SS SS	1-2-1		1.50 1.50	Bentonite Pellets			
35	740	33.50 - 35.00 CLAYEY SAND; some silt, red with some brown, highly weathered trace mica, cohesive, w>PL, wet, soft to very soft, trace gravel	SC		741.8 33.50 740.3 35.00	R6	SS SS	WH-WH-2		1.40 1.50	Sand Filter Pack			
40		38.50 - 40.00 CLAYEY SAND; some gravel of gneiss (bottom 0.5'), black-brown with red, highly	SC		736.8 38.50 735.3	R7	SS SS	2-6-22		1.30 1.50	3" PVC 0.010			
		Log continued on next page												

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: SCS CFS  
DRILLER: S. Deuty

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Brian Steele, PG  
DATE: 8/24/2020





# RECORD OF BOREHOLE B-100

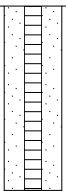

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 44.80 ft  
LOCATION: Smyrna, GA

DRILL RIG: CME 550X  
DATE STARTED: 7/8/20  
DATE COMPLETED: 7/8/20

NORTHING: 1,390,254.80  
EASTING: 2,202,242.10  
GS ELEVATION: 775.32  
TOC ELEVATION: 777.95 ft

DEPTH W.L.: 34.78  
ELEVATION W.L.: 743.17  
DATE W.L.: 7/8/20  
TIME W.L.: 15:50

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
40	735	weathered, non-cohesive, wet, loose to compact			40.00						Slot U-Pack Screen 	<b>WELL CASING</b> Interval: 0'-44'8" Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam  <b>WELL SCREEN</b> Interval: 34'8"-44'8" Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC  <b>FILTER PACK</b> Interval: 32'2"-44'8" Type: Filtersil std61  <b>FILTER PACK SEAL</b> Interval: 30'-32'2" Type: 3/8" Coated Pel-Plug  <b>ANNULUS SEAL</b> Interval: 2'-30' Type: Aquagard Bentonite Grout  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Auger Rock Drill:
		42.50 - 45.00 CLAYEY SAND; some gravel, red with black and brown, highly weathered, cohesive, w~PL, firm to soft, micaceous schist gravel	SC		732.8 42.50	R8	SS	4-5-12		0.00 1.50		
45	730	Boring completed at 44.80 ft			730.3 45.00							
50	725											
55	720											
60	715											
65	710											
70	705											
75	700											
80												

BOREHOLE RECORD MCDONOUGH MASTER LIST\_BACKUP\_SURVEY UPDATED (5).GPJ PIEDMONT.GDT 9/2/20

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: SCS CFS  
DRILLER: S. Deuty

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Brian Steele, PG  
DATE: 8/24/2020





# RECORD OF BOREHOLE B-101D

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 75.00 ft  
LOCATION: Next to DGWC-9

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/11/20  
DATE COMPLETED: 11/12/20

NORTHING: 1394063.6  
EASTING: 2204168.2  
GS ELEVATION: 821.24 ft  
TOC ELEVATION: 824.29 ft

DEPTH W.L.: 34.0  
ELEVATION W.L.: 790.3  
DATE W.L.: 11/12/20  
TIME W.L.: 0954

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 10.00 Air knife; FILL	FILL						Stick-up --	<b>B-101D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0-75' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 64.9'-74.9' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 62.5'-75.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 59.0'-62.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-59.0' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
5										
10		10.00 - 15.00 (SM), SILTY SAND; tannish brown to reddish brown, low plasticity, w<pl, dry, loose to soft	SM		10.00					
15		15.00 - 16.00 (TWR), TRANSITIONALLY WEATHERED ROCK; dark gray, deeply weathered, fine to medium, poorly jointed	TWR		15.00	1	ROTO SONIC	8.00 10.00		
		16.00 - 20.00 (CL), CLAY; some sand, reddish brown, fine to coarse, low plasticity, w<PL, soft, moist to wet	CL		16.00					
20		20.00 - 23.00 (ML), SILT; trace to some gravels, reddish brown, low plasticity, w<PL, very soft, wet	ML		20.00	2	ROTO SONIC	4.00 5.00		
		23.00 - 25.00 (SM), SILTY SAND; trace gravels, tannish brown to gray, non-plastic, w<PL, loose, dry, TWR	TWR		23.00					
25		25.00 - 35.00 NO RECOVERY; material washed out of core barrel after switching to rock coring methods based on the TWR at the 23-25' interval.	NR		25.00	3	ROTO SONIC	0.00 10.00		
30										
35		35.00 - 40.00 NO RECOVERY; The core barrel was able to be advanced to depth, but casing was not able to advance to depth. Material was lost while extracting core barrel.	NR		35.00	4	ROTO SONIC	0.00 5.00	AquaGuard Bentonite Grout	
40		40.00 - 50.00 NO RECOVERY; The core barrel was able to be advanced to depth, but casing was not able to advance to depth. Material was lost while extracting core barrel.	NR		40.00	5	ROTO SONIC	0.00 10.00		
45										
50		Log continued on next page								

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-101D

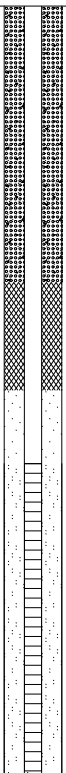
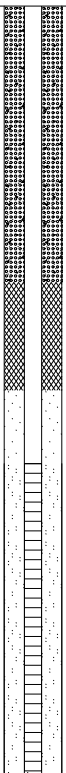
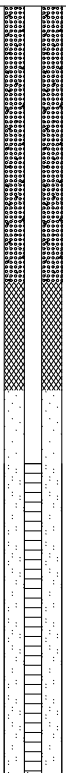
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 75.00 ft  
LOCATION: Next to DGWC-9

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/11/20  
DATE COMPLETED: 11/12/20

NORTHING: 1394063.6  
EASTING: 2204168.2  
GS ELEVATION: 821.24 ft  
TOC ELEVATION: 824.29 ft

DEPTH W.L.: 34.0  
ELEVATION W.L.: 790.3  
DATE W.L.: 11/12/20  
TIME W.L.: 0954

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		50.00 - 51.00 (ML), SANDY SILT; grayish brown, low to medium plasticity, w~PL, soft to firm, moist	ML		50.00	6	ROTO SONIC	9.50 10.00		<b>B-101D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0-75' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 64.9'-74.9' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 62.5'-75.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 59.0'-62.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-59.0' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons <b>NOTES</b>
		51.00 - 52.00 (ML), SILT; trace gravels, schist fragments, grayish tan, non-plastic, non-cohesive, w~PL, loose, dry	ML		51.00					
		52.00 - 52.30 (TWR), TRANSITIONALLY WEATHERED ROCK; deeply weathered, R2, well foliated, fine to medium grain, iron staining.	TWR		52.30					
55		52.30 - 60.00 (ML), SANDY SILT; with gravel, grayish brown, low to medium plasticity, w~PL, soft to firm, moist	ML							
60		60.00 - 70.00 (SCHIST), BEDROCK; well foliated, highly crenulated, poorly jointed, iron staining	BR		60.00	7	ROTO SONIC	2.50 10.00		
65										
70		70.00 - 72.00 (ML), SANDY SILT; grayish brown, low to medium plasticity, w~PL, soft to firm, moist	ML		70.00	8	ROTO SONIC	3.55 5.00		
		72.00 - 75.00 (SCHIST), BEDROCK; well foliated, highly crenulated, poorly jointed, iron staining	BR		72.00					
75		Boring completed at 75.00 ft								
80										
85										
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-102D

SHEET 1 of 2


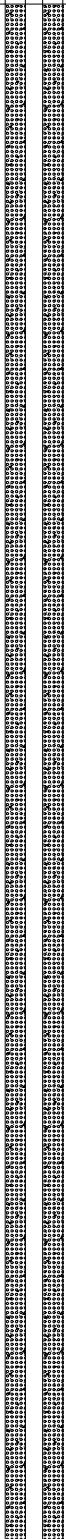



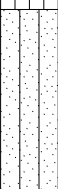

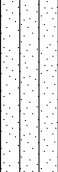


PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.00 ft  
LOCATION: Next to DGWC-10

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/9/20  
DATE COMPLETED: 11/10/20

NORTHING: 1393828.4  
EASTING: 2204200.4  
GS ELEVATION: 820.64 ft  
TOC ELEVATION: 823.42 ft

DEPTH W.L.: 34.0  
ELEVATION W.L.: 789.4  
DATE W.L.: 11/10/2020  
TIME W.L.: 1444

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) (3) (1) (2) GPJ PIEDMONT.GDT 7/19/21

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS					
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	REC								
					DEPTH (ft)										
0		0.00 - 10.00 Air knife; FILL	FILL			1	ROTO SONIC	6.50 10.00	Stick-up – 	<b>B-102D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 74.4'-84.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.0'-75.4' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 67'-72' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-67' Type: AquaGuard Bentonite Grout Quantity: Approximately 120 gallons  <b>NOTES</b>					
5															
10		10.00 - 15.50 (CL), CLAY; red brown, trace to some sand, fine grain, w~PL, low plasticity, soft, moist			CL							10.00			
15		15.50 - 17.50 (ML), SILT; red brown, trace gravels, non-plastic to low plasticity, w<PL, soft, moist			ML							15.50			
		17.50 - 20.00 (ML), SILT; tanish-orange brown to silver, nonplastic to low plasticity, soft to loose	ML		17.50										
20		20.00 - 26.00 (SM), SILTY SAND; bronze, some coarse sand, nonplastic, dry to moist	SM		20.00	2	ROTO SONIC	10.00 10.00	AquaGuard Bentonite – Grout						
25		26.00 - 30.00 (SM), SILTY SAND; gray, some coarse sand, nonplastic, non-cohesive, compact, dry to moist			26.00										
30		30.00 - 40.00 (SM), SILTY SAND; gray and orange-brown, non-plastic to low plasticity, firm to compact, dry to moist, soft to firm, contains muscovite	SM		30.00	3	ROTO SONIC	9.00 10.00							
35															
40		40.00 - 44.00 (SM), SILTY SAND; gray and orange-brown, non-plastic to low plasticity, firm to compact, dry to moist, soft to firm	SM		40.00	4	ROTO SONIC	7.00 10.00							
45		44.00 - 46.00 (ML), SILT; gray, non-plastic to lows plasticity, soft, moist,	ML		44.00										
		46.00 - 50.00 (SM), SILTY SAND; reddish brown, non-plastic to low plasticity, very soft, wet	SM		46.00										
50		Log continued on next page													

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-102D

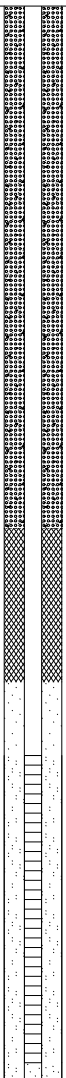
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.00 ft  
LOCATION: Next to DGWC-10

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/9/20  
DATE COMPLETED: 11/10/20

NORTHING: 1393828.4  
EASTING: 2204200.4  
GS ELEVATION: 820.64 ft  
TOC ELEVATION: 823.42 ft

DEPTH W.L.: 34.0  
ELEVATION W.L.: 789.4  
DATE W.L.: 11/10/2020  
TIME W.L.: 1444

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		50.00 - 51.00 (SM), SILTY SAND; reddish brown, non-plastic to low plasticity, very soft, wet	SM		50.00	5	ROTO SONIC	5.00 5.00		<b>B-102D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 74.4'-84.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.0'-75.4' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 67'-72' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-67' Type: AquaGuard Bentonite Grout Quantity: Approximately 120 gallons  <b>NOTES</b>
		51.00 - 55.00 (SM), SILTY SAND; gray, w<PL, fine to compact, dry to moist, contains muscovite	SM		51.00					
55		55.00 - 60.00 (SM), SILTY SAND; gray to yellow orange, w<PL, fine to stiff, dry to moist, saprolitic	SM		55.00	6	ROTO SONIC	5.00 5.00		
60		60.00 - 65.00 (ML), SILT; gray to light brown, w<PL, dense, dry	ML		60.00	7	ROTO SONIC	4.00 5.00		
65		65.00 - 70.00 (TWR), TRANSITIONALLY WEATHERED ROCK; silty sand, gray, low plasticity, w<PL, stiff to hard, dry, saprolitic	TWR		65.00	8	ROTO SONIC	5.00 5.00		
70		70.00 - 75.00 (SCHIST), BEDROCK, dark gray to black, fine to medium grain, moderately foliated, poorly jointed, high crenulated, weak to strong rock, slightly to moderately weathered, feldspar, muscovite, schist.	BR		70.00	9	ROTO SONIC	5.00 5.00		
75		75.00 - 85.00 (SCHIST), BEDROCK; dark gray to black, moderately foliated, poorly jointed, high crenulated, weak to strong rock, slightly to moderately weathered, feldspar, muscovite, schist	BR		75.00	10	ROTO SONIC	7.00 10.00		
85		Boring completed at 85.00 ft								
90										
95										
100										

BOREHOLE RECORD McDONOUGH MASTER LIST (2) (3) (1) (2) GPJ PIEDMONT.GDT 7/19/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





## SHEET 1 of 2

DEPTH W.L.: 12.0  
ELEVATION W.L.: 783.9  
DATE W.L.: 10/15/2020  
TIME W.L.: 0740

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

GOLDER



# RECORD OF BOREHOLE B-103D

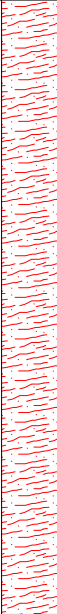
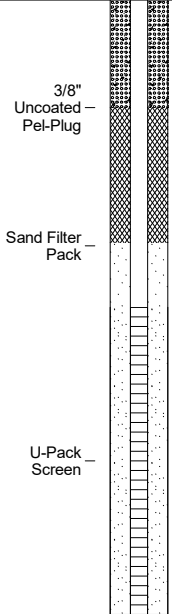
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 70.00 ft  
LOCATION: East of DGWC-47

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/14/20  
DATE COMPLETED: 10/15/20

NORTHING: 1391543.5  
EASTING: 2202614.4  
GS ELEVATION: 793.77 ft  
TOC ELEVATION: 795.96 ft

DEPTH W.L.: 12.0  
ELEVATION W.L.: 783.9  
DATE W.L.: 10/15/2020  
TIME W.L.: 0740

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		40.00 - 70.00 (GNEISS), BEDROCK; light gray-green to dark gray; well foliated, poorly jointed, muscovite, biotite, feldspar, quartz (Continued)	BR							<b>B-103D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-70' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 60'-70' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 57.9'-70.0' Type: FilterSil Quantity: 3.5-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 53.5'-57.9' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-53.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 40 gallons <b>NOTES</b>
55						7	ROTO SONIC	7.50 10.00		
60										
65						8	ROTO SONIC	9.65 10.00		
70		Boring completed at 70.00 ft								
75										
80										
85										
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-104D






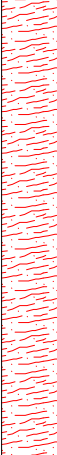
SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 60.00 ft  
LOCATION: East of DGWC-48

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/20/20  
DATE COMPLETED: 10/20/20

NORTHING: 1391318.3  
EASTING: 2202298.5  
GS ELEVATION: 785.31 ft  
TOC ELEVATION: 787.90 ft

DEPTH W.L.: 12.0  
ELEVATION W.L.: 775.9  
DATE W.L.: 10/20/2020  
TIME W.L.: 1818

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 10.00 Air knife; FILL	FILL						Stick-up --	<b>B-104D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-60' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 50'-60' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 47.15'-60.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 44'-47.15' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-44' Type: AquaGuard Bentonite Grout Quantity: Approximately 40 gallons  <b>NOTES</b>
10		10.00 - 12.00 (CL), CLAY; red brown; moist, soft, low plasticity, w<PL, FILL	CL		10.00					
12		12.00 - 22.00 (ML), SILT; dark brown to gray; non-plastic to low plasticity, dry to moist, w<PL, soft to firm	ML		12.00	1	ROTO SONIC	8.00 8.00		
20						2	ROTO SONIC	4.00 4.00		
22		22.00 - 30.00 (ML), SILT; dark brown; w~PL, moist to wet, soft to firm, contains gravels of biotite gneiss (trace)	ML		22.00	3	ROTO SONIC	8.00 8.00	AquaGuard Bentonite -- Grout	
30		30.00 - 35.00 (TWR), TRANSITIONALLY WEATHERED ROCK; rust brown to gray; deeply weathered biotite gneiss, poorly foliated, poorly jointed, iron staining	TWR		30.00					
35		35.00 - 55.50 (GNEISS), BEDROCK; biotite, quartz, feldspar, light to dark gray, strong to medium strong, fresh to slightly weathered, locally contains iron staining and garnets	BR		35.00	4	ROTO SONIC	6.55 10.00		3/8" Uncoated -- Pel-Plug   Sand Filter --
45						5	ROTO SONIC	2.10 5.00		
50						6	ROTO SONIC	4.35 7.50		

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21



BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21



# RECORD OF BOREHOLE B-104D

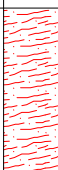
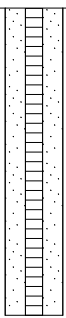

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 60.00 ft  
LOCATION: East of DGWC-48

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/20/20  
DATE COMPLETED: 10/20/20

NORTHING: 1391318.3  
EASTING: 2202298.5  
GS ELEVATION: 785.31 ft  
TOC ELEVATION: 787.90 ft

DEPTH W.L.: 12.0  
ELEVATION W.L.: 775.9  
DATE W.L.: 10/20/2020  
TIME W.L.: 1818

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC		
					DEPTH (ft)					
50		35.00 - 55.50 (GNEISS), BEDROCK; biotite, quartz, feldspar, light to dark gray, strong to medium strong, fresh to slightly weathered, locally contains iron staining and garnets <i>(Continued)</i>	BR			6		4.35 7.50	<div>Pack</div> <div>U-Pack Screen</div> 	<b>B-104D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-60' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 50'-60' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 47.15'-60.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 44'-47.15' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-44' Type: AquaGuard Bentonite Grout Quantity: Approximately 40 gallons  <b>NOTES</b>
55		55.50 - 60.00 (SCHIST), BEDROCK; quartz, muscovite, gray to silver, medium grain, medium strong, fresh to moderately weathered	BR		55.50	7	ROTO SONIC	6.15 7.50		
60		Boring completed at 60.00 ft								
65										
70										
75										
80										
85										
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-105D







SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 70.00 ft  
LOCATION: East of DGWC-40

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/18/20  
DATE COMPLETED: 10/19/20

NORTHING: 1390634.5  
EASTING: 2201831.9  
GS ELEVATION: 776.03 ft  
TOC ELEVATION: 779.01 ft

DEPTH W.L.: 22.50  
ELEVATION W.L.: 756.5  
DATE W.L.: 10/19/2020  
TIME W.L.: 0950

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC		
					DEPTH (ft)					
0		0.00 - 10.00 Air knife; FILL	FILL						Stick-up –	<b>B-105D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-70' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 60'-70' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 57.5'-60.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 53.75'-57.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-53.75' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
5										
10		10.00 - 15.00 (ML), SILT; red to orange brown, some clay, low plasticity, dry to moist, w<PL, soft to firm, FILL	CL-ML		10.00					
15		15.00 - 27.00 (ML), SILT; olive brown to silvery brown, low plasticity, moist, firm, w<PL, contains muscovite			15.00	1	ROTO SONIC	9.25 10.00		
20			ML							
25						2	ROTO SONIC	6.00 7.50		
30		27.00 - 27.50 (CL), CLAY; white, medium plasticity, firm, moist, w<PL, possible WT	CL		27.50					
30		27.50 - 32.50 (ML), SILT; gray/brown, fine grain, low to medium plasticity, moist, w~PL, soft to firm	ML							
35		32.50 - 33.80 (SM), SILTY SAND; non-plastic to low plasticity, dry to moist, fine to coarse, w<PL, loose, sand is mica (biotite/muscovite)	SM		32.50	3	ROTO SONIC	8.50 10.00		
35		33.80 - 37.50 (ML), SILT; gray/brown, fine grain, low to moderate plasticity, moist, w~PL, soft to firm	ML		33.80				AquaGuard Bentonite – Grout	
40		37.50 - 40.00 (ML), SILT; whitish gray, trace fine sand, low plasticity, moist to dry, w~PL, firm/compact, high feldspar	ML		37.50	4	ROTO SONIC	2.50 2.50		
45		40.00 - 45.00 (SM), SILTY SAND; brown to black, non-plastic to low plasticity, moist, w<PL, fine to coarse, compact to loose. Sand particles size is mica, not quartz.	SM		40.00	5	ROTO SONIC	5.00 5.00		
50		45.00 - 50.00 (SM), SILTY SAND; rock flour, trace gravels, tan brown, non-plastic, dry, fine to coarse, w<PL, loose, sand is micaceous, transitions to TWR from 48.8'-50.0'	SM		45.00	6	ROTO SONIC	5.00 5.00		
Log continued on next page										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-105D

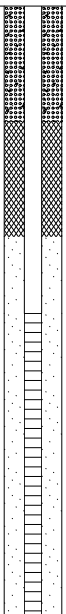
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 70.00 ft  
LOCATION: East of DGWC-40

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/18/20  
DATE COMPLETED: 10/19/20

NORTHING: 1390634.5  
EASTING: 2201831.9  
GS ELEVATION: 776.03 ft  
TOC ELEVATION: 779.01 ft

DEPTH W.L.: 22.50  
ELEVATION W.L.: 756.5  
DATE W.L.: 10/19/2020  
TIME W.L.: 0950

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		50.00 - 55.00 (SM), SILTY SAND; brown to black, low to medium plasticity, moist to dry, w<PL, loose/soft, materials is from gneiss (relief structure), TWR	SM		50.00	7	ROTO SONIC	5.00 5.00		<b>B-105D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-70' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 60'-70' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 57.5'-60.0' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 53.75'-57.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-53.75' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
55		55.00 - 70.00 (GNEISS), BEDROCK; light to dark gray, fine to medium grain, well foliated, poorly jointed, fresh to slightly weathered, strong to medium strong	BR		55.00	8	ROTO SONIC	2.75 3.50		
60						9	ROTO SONIC	4.80 6.50		
65						10	ROTO SONIC	4.25 5.00		
70		Boring completed at 70.00 ft								
75										
80										
85										
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ | PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-106D

SHEET 1 of 2


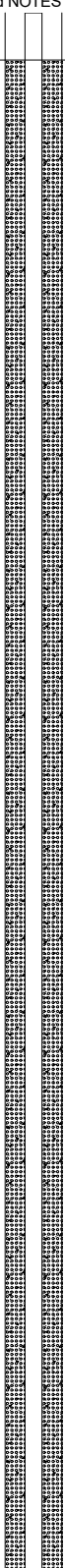
PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 80.00 ft  
LOCATION: North of DGWC-8

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/12/20  
DATE COMPLETED: 11/13/20

NORTHING: 1394327.1  
EASTING: 2203869.2  
GS ELEVATION: 823.39 ft  
TOC ELEVATION: 826.21 ft

DEPTH W.L.: 37.0  
ELEVATION W.L.: 789.2  
DATE W.L.: 11/13/2020  
TIME W.L.: 1652

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) GPJ PIEDMONT.GDT 2/3/21

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS				
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC						
					DEPTH (ft)									
0		0.00 - 10.00 Air knife; FILL	FILL			1	ROTO SONIC	8.20 10.00	 AquaGuard Bentonite – Grout	<b>B-106D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-80' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 69.4'-79.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 66.61'-80' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 62.85'-66.61' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-62.85' Type: AquaGuard Bentonite Grout Quantity:  <b>NOTES</b>				
5														
10		10.00 - 16.75 (ML), SILT; some fine to medium sand, some gravel, moist, firm, w<PL, low to medium plasticity			ML						10.00			
15		16.75 - 18.10 (ML), SILT; some coarse sand, moist, stiff, w<PL	ML	16.75										
20		18.10 - 20.00 (CL), CLAY; red to red-brown, some coarse sand, dry to moist, w<PL, soft, some muscovite, Fill	CL	18.10										
25		20.00 - 28.00 (ML), SILT; brown, some fines, very fine to coarse sand, wet, soft to very soft, w<PL, medium plasticity,	ML	20.00	2	ROTO SONIC	10.00 10.00							
30		28.00 - 30.00 (SP), SAND; uniformly graded, some silt, non-cohesive, loose, moist, non-plastic	SP	28.00										
35		30.00 - 32.00 (SM), SILTY SAND; brown, trace gravel, dry to moist, cohesive, firm to stiff, w<PL, low plasticity, some crenulations, saprolitic	SM	30.00	3	ROTO SONIC	5.00 5.00							
40		32.00 - 35.00 (SM), SILTY SAND; dry to moist, cohesive, firm to stiff, w~PL, low to medium plasticity	SM	32.00										
45		35.00 - 40.00 (ML), SANDY SILT; brown, fine to coarse sand, micas, firm to stiff, w>PL, dry to wet	ML	35.00	4	ROTO SONIC	5.00 5.00							
50		40.00 - 45.00 (SM), SILTY SAND, brown, fine to coarse sand, some gravel, schist, quartz vein fragments, micas, firm to stiff, w<PL, moist, medium plasticity	SM	40.00	5	ROTO SONIC	5.00 5.00							
		45.00 - 47.00 (SM), SILTY SAND, brown, fine to coarse sand, some gravel, schist, quartz vein fragments, micas, stiff to very stiff, w>PL, moist, medium plasticity, saprolitic	SM	45.00	6	ROTO SONIC	2.00							
		47.00 - 60.00 NO RECOVERY; material too loose and continues to fall out of core barrel	NR	47.00	7		0.00 13.00							
		Log continued on next page												

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-106D

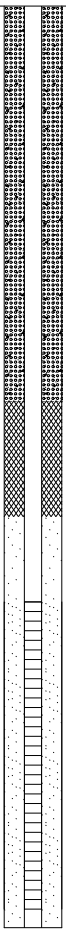
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 80.00 ft  
LOCATION: North of DGWC-8

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/12/20  
DATE COMPLETED: 11/13/20

NORTHING: 1394327.1  
EASTING: 2203869.2  
GS ELEVATION: 823.39 ft  
TOC ELEVATION: 826.21 ft

DEPTH W.L.: 37.0  
ELEVATION W.L.: 789.2  
DATE W.L.: 11/13/2020  
TIME W.L.: 1652

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		47.00 - 60.00 NO RECOVERY; material too loose and continues to fall out of core barrel <i>(Continued)</i>	NR			7	ROTO SONIC	0.00 13.00	 <p>3/8" Uncoated - Pel-Plug</p> <p>Sand Filter Pack</p> <p>U-Pack Screen</p>	<b>B-106D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-80' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 69.4'-79.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 66.61'-80' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 62.85'-66.61' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-62.85' Type: AquaGuard Bentonite Grout Quantity: <b>NOTES</b>
55										
60		60.00 - 65.00 (SCHIST), BEDROCK; silvery blue, well foliated, poorly jointed, moderate to deeply weathered, weak to medium strong rock, iron staining	BR		60.00	8	ROTO SONIC	1.60 5.00		
65		65.00 - 75.00 (BIOTITE GNEISS), BEDROCK; light gray to dark gray, zones of muscovite schistosity, very fine grain, moderate to poor foliation, poorly jointed, fresh to moderately weathered, medium strong, iron staining, feldspar, quartz, muscovite	BR		65.00	9	ROTO SONIC	5.20 10.00		
70										
75		75.00 - 80.00 (BIOTITE GNEISS), BEDROCK; light gray to dark gray, zones of muscovite schistosity, very fine grain, moderate to poor foliation, poorly jointed, fresh to moderately weathered, medium strong, iron staining, feldspar, quartz	BR		75.00	10	ROTO SONIC	3.40 5.00		
80		Boring completed at 80.00 ft								
85										
90										
95										
100										

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21



BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21



# RECORD OF BOREHOLE B-107D





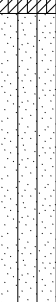





SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.75 ft  
LOCATION: Southwest of DGWC-19

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/28/20  
DATE COMPLETED: 10/28/20

NORTHING: 1392334.5  
EASTING: 2202596.4  
GS ELEVATION: 820.44 ft  
TOC ELEVATION: 823.38 ft

DEPTH W.L.: 21.8  
ELEVATION W.L.: 801.6  
DATE W.L.: 10/28/2020  
TIME W.L.: 1440

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC		
					DEPTH (ft)					
0		0.00 - 10.00 Air knife; FILL	FILL						Stick-up – 	<b>B-107D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-85.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 75.1'-85.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.25'-85.5' Type: FilterSil Quantity: 4.5-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 68.8'-72.25' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon <b>ANNULUS SEAL</b> Interval: 0'-68.8' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
5										
10		10.00 - 20.00 (CL-ML), SILT and CLAY; red brown to brown, trace sand, low to medium plasticity, soft to firm, moist, contains muscovite	CL-ML		10.00	1	ROTO SONIC	7.00 10.00		
15										
20		20.00 - 38.00 (SM), SILTY SAND; brown to tannish brown, trace sand, w<PL, low plasticity, loose to compact, large grains of muscovite	SM		20.00	2	ROTO SONIC	4.30 10.00		
25										
30						3	ROTO SONIC	10.00 10.00		
35										
40		38.00 - 40.00 (SM), SILTY SAND; black and silverish gray, fine to medium, non-plastic, w<PL, loose sand, moist,	SM		38.00					
45		40.00 - 50.00 (SM-ML), SILTY SAND to SILT; brown to silverish brown, moist to wet, w<PL, soft to stiff	SM		40.00	4	ROTO SONIC	9.00 10.00		
50										
Log continued on next page										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-107D

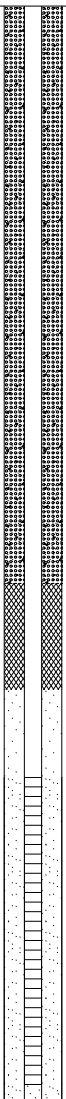
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.75 ft  
LOCATION: Southwest of DGWC-19

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/28/20  
DATE COMPLETED: 10/28/20

NORTHING: 1392334.5  
EASTING: 2202596.4  
GS ELEVATION: 820.44 ft  
TOC ELEVATION: 823.38 ft

DEPTH W.L.: 21.8  
ELEVATION W.L.: 801.6  
DATE W.L.: 10/28/2020  
TIME W.L.: 1440

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		50.00 - 60.00 (SM-ML), SILTY SAND to SILT; brown to silverish brown, moist to wet, w<PL, soft to stiff	SM		50.00	5	ROTO SONIC	6.00 10.00		<b>B-107D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-85.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 75.1'-85.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.25'-85.5' Type: FilterSil Quantity: 4.5-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 68.8'-72.25' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon <b>ANNULUS SEAL</b> Interval: 0'-68.8' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
55										
60		60.00 - 67.00 NO RECOVERY; material was washed away by coring methods. Material from 63' to 67' is inferred as TWR.	NR		60.00	6	ROTO SONIC	0.00 7.00		
65										
70		67.00 - 75.00 (GNEISS), BEDROCK; dark gray to black, well foliated, poorly jointed, slightly to deeply weathered, weak to medium strong, feldspar, quartz, muscovite,	BR		67.00	7	ROTO SONIC	6.70 8.00		
75										
80		75.00 - 85.75 (GNEISS), BEDROCK; dark gray to black, well foliated, poorly jointed, slightly to deeply weathered, weak to medium strong, feldspar, quartz, muscovite,	BR		75.00	8	ROTO SONIC	6.80 10.75		
85										
		Boring completed at 85.75 ft			85.75					
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-108D








SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 80.00 ft  
LOCATION: Next to DGWC-20

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/26/20  
DATE COMPLETED: 10/27/20

NORTHING: 1392156.1  
EASTING: 2202312.5  
GS ELEVATION: 818.33 ft  
TOC ELEVATION: 821.13 ft

DEPTH W.L.: 17.7  
ELEVATION W.L.: 803.43  
DATE W.L.: 10/27/2020  
TIME W.L.: 0915

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM AND NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC		
					DEPTH (ft)					
0		0.00 - 10.00 Air knife; FILL	FILL						Stick-up – 	<b>B-108D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-80.0' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 69'-79' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 65.85'-79' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 62.5'-65.85' Type: 3/8" Uncoated Pel-Plug Quantity: 1- 5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-62.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
5										
10		10.00 - 12.00 (CL), CLAY:w<PL, low plasticity, moist to wet, Fill	CL		10.00					
15		12.00 - 20.00 (ML), SILT; tannish brown with black spots, trace fine sand, w<PL, non-plastic to low plasticity, compact to firm, moist	ML		12.00	1	ROTO SONIC	<u>10.00</u> 10.00		
20		20.00 - 30.00 (ML), SILT; tannish brown with black/silver spots, trace to some fine sand, w<PL, low plasticity, dry to moist, firm, saprolite, deeply weather biotite gneiss			20.00					
25			ML			2	ROTO SONIC	<u>9.50</u> 10.00		
30										
35		30.00 - 40.00 (ML-SM), SILT and SILTY SAND; silverish brown, trace clay, w<PL, nonplastic to low plasticity, moist, firm to stiff, contains muscovite, saprolite	SM		30.00	3	ROTO SONIC	<u>8.00</u> 10.00	AquaGuard Bentonite – Grout	
40										
45		40.00 - 50.00 (ML-SM), SILT and SILTY SAND; silverish brown, trace clay, w<PL, nonplastic to low plasticity, moist, soft to firm, contains muscovite, saprolite	SM		40.00	4	ROTO SONIC	<u>6.75</u> 10.00		
50										
Log continued on next page										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-108D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 80.00 ft  
LOCATION: Next to DGWC-20

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 10/26/20  
DATE COMPLETED: 10/27/20

NORTHING: 1392156.1  
EASTING: 2202312.5  
GS ELEVATION: 818.33 ft  
TOC ELEVATION: 821.13 ft

DEPTH W.L.: 17.7  
ELEVATION W.L.: 803.43  
DATE W.L.: 10/27/2020  
TIME W.L.: 0915

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		50.00 - 51.00 (SP), SAND; black to dark gray, w<PL, non-plastic, firm, loose, wet	SP		50.00					
		51.00 - 57.50 (ML), SILT; gray to brown, w<PL, low plasticity, firm to stiff, moist, saprolite	ML		51.00	5	ROTO SONIC	7.50 7.50		
55										
60		57.50 - 65.00 (GNEISS), BEDROCK; dark brown to gray, well foliated, poorly jointed, deeply weathered, weak rock, iron staining	BR		57.50	6	ROTO SONIC	1.25 7.50		
65										
70		65.00 - 75.00 (GNEISS), BEDROCK; dark brown to gray, well foliated, poorly jointed, fresh to slightly weathered, medium strong rock, iron staining	BR		65.00	7	ROTO SONIC	6.55 10.00		
75										
80		75.00 - 80.00 (GNEISS), BEDROCK; dark brown to gray, well foliated, poorly jointed, fresh to slightly weathered, medium strong rock, iron staining	BR		75.00	8	ROTO SONIC	4.80 5.00		
		Boring completed at 80.00 ft								
85										
90										
95										
100										

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-109D

SHEET 1 of 2
















PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 100.00 ft  
LOCATION: Next to DGWC-2

DRILL RIG: Geoprobe 8140LS  
DATE STARTED: 10/30/20  
DATE COMPLETED: 10/31/20

NORTHING: 1393957.5  
EASTING: 2202127  
GS ELEVATION: 847.78 ft  
TOC ELEVATION: 850.73 ft

DEPTH W.L.: 23.50  
ELEVATION W.L.: 827.2  
DATE W.L.: 10/31/2020  
TIME W.L.: 1157

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) (3) (1) (2) GPJ PIEDMONT.GDT 7/19/21

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM AND NOTES	WELL CONSTRUCTION DETAILS							
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC									
					DEPTH (ft)												
0		0.00 - 10.00 Air knife; FILL	FILL			1	ROTO SONIC	10.00 10.00	Stick-up –	  	<b>B-109D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-100' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 89.4'-99.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 86.5'-99.4' Type: FilterSil Quantity: 4-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 83.9'-86.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-83.9' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>						
5																	
10		10.00 - 13.50 (ML). SILT; brown, soft,			ML								10.00				
15		13.50 - 20.00 (CL). CLAY; red to red brown, trace sand, medium plasticity, w<PL, firm, moist to dry,	CL		13.50												
20		20.00 - 30.00 (SM). SILTY SAND; gray to reddish gray, fine to medium, loose to soft, dry to moist, w<PL, low plasticity, quartz, biotite, feldspar	SM		20.00	2	ROTO SONIC	3.70 10.00									
25																	
30		30.00 - 36.00 (SM). SILTY SAND; gray to reddish gray, some clay, fine to medium, loose to soft, dry to moist, w<PL, low plasticity, quartz, biotite, feldspar	SM		30.00	3	ROTO SONIC	6.00 6.00									
35		36.00 - 40.00 (CL). CLAY; black to dark gray, low plasticity, w<PL, very soft to hard, dry to moist, saprolite, biotite gneiss, saprolite,	CL		36.00	4	ROTO SONIC	4.00 4.00									
40		40.00 - 45.00 (TWR). TRANSITIONALLY WEATHERED ROCK; black to dark gray, silt with some fine sand, trace gravels, low plasticity, w<PL, soft, moist to wet, biotite gneiss fragments	TWR		40.00	5	ROTO SONIC	2.20 5.00									
45		45.00 - 46.00 (GRANITE). BEDROCK; biotite, feldspar, quartz, white to light gray, fine grain, quartz veins, weakly foliated, poorly jointed, fresh to slightly weathered, medium strong	BR		45.00	6	ROTO SONIC	4.20 10.00	AquaGuard Bentonite – Grout	  							
50		46.00 - 55.00 (GNEISS). BEDROCK; feldspar, quartz, biotite, black to dark gray, well foliated, poorly jointed fresh to slightly weathered, medium strong to weak, iron staining	BR		46.00												
Log continued on next page																	

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





## SHEET 2 of 2

DEPTH W.L.: 23.50  
ELEVATION W.L.: 827.2  
DATE W.L.: 10/31/2020  
TIME W.L.: 1157

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) (3) (1) (2).GPJ PIEDMONT.GDT 7/19/21

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-110D






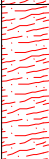
SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 65.00 ft  
LOCATION: Next to DGWC-68A

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/14/20  
DATE COMPLETED: 11/17/20

NORTHING: 1391294.4  
EASTING: 2200736  
GS ELEVATION: 764.55 ft  
TOC ELEVATION: 764.61 ft

DEPTH W.L.: 9.35  
ELEVATION W.L.: 755.3  
DATE W.L.: 11/17/2020  
TIME W.L.: 1110

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 Hand Auger 0'-10'; core loss from 0'-5',	NR						Flush mount -	<b>B-110D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-65' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 53'-63' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 50.5'-63' Type: FilterSil Quantity: 3.5-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 46'-50.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-46' Type: AquaGuard Bentonite Grout Quantity: Approximately 85 gallons  <b>NOTES</b>
5		5.00 - 8.50 (CL), CLAY; reddish brown to yellowish orange, trace to some fine to medium sand, moist, low plasticity, w<PL, soft to firm, Fill	CL		5.00	1	ROTO SONIC	7.00 12.00		
10		8.50 - 12.00 (ML), SILT; brown to dark brown, trace fine sand, moist, non-plastic, w<PL, soft	ML		8.50					
15		12.00 - 20.00 (ML), SILT; brown to dark brown, some fine sand, moist, non-plastic, w<PL, soft	ML		12.00	2	ROTO SONIC	3.00 8.00		
20		20.00 - 25.00 (ML), SILT; brown to dark brown, some fine sand, moist, non-plastic, w<PL, firm to stiff	ML		20.00	3	ROTO SONIC	3.00 5.00	AquaGuard Bentonite - Grout	
25		25.00 - 35.00 NO RECOVERY; material too loose and soft to stay in core barrel	NR		25.00					
30			NR			4	ROTO SONIC	0.00 10.00		3/8" Uncoated - Pel-Plug
35		35.00 - 45.00 (GNEISS), BEDROCK; biotite, feldspar, quartz, light gray to white, well foliated, poorly jointed, fine-to medium-grained, fresh to slightly weathered, strong rock, locally contains vein quartz and garnets	BR		35.00	5	ROTO SONIC	6.40 10.00		
40			BR			6	ROTO SONIC	8.70 10.00		
45		45.00 - 55.00 (GNEISS), BEDROCK; biotite, feldspar, quartz, light gray to white, well foliated, poorly jointed, veining quartz, fine to medium-grained, fresh to slightly weathered, strong rock, zones of fine-grained biotite	BR		45.00					
50		Log continued on next page								

BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-110D

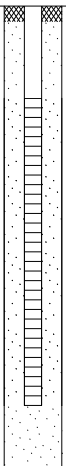
SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 65.00 ft  
LOCATION: Next to DGWC-68A

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/14/20  
DATE COMPLETED: 11/17/20

NORTHING: 1391294.4  
EASTING: 2200736  
GS ELEVATION: 764.55 ft  
TOC ELEVATION: 764.61 ft

DEPTH W.L.: 9.35  
ELEVATION W.L.: 755.3  
DATE W.L.: 11/17/2020  
TIME W.L.: 1110

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50		45.00 - 55.00 (GNEISS), BEDROCK; biotite, feldspar, quartz, light gray to white, well foliated, poorly jointed, veing quartz, fine to medium-grained, fresh to slightly weathered, strong rock, zones of fine-grained biotite (Continued)	BR			6	ROTO SONIC	8.70 10.00	 <p>Sand Filter Pack</p> <p>U-Pack Screen</p>	<b>B-110D</b> Borehole Diameter: 4" <b>WELL CASING</b> Interval: 0'-65' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 53'-63' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 50.5'-63' Type: FilterSil Quantity: 3.5-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 46'-50.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-46' Type: AquaGuard Bentonite Grout Quantity: Approximately 85 gallons  <b>NOTES</b>
55		55.00 - 60.00 (GNEISS), BEDROCK; biotite, feldspar, quartz, light gray to white, well foliated, poorly jointed, veing quartz, fine to medium grain, fresh to slightly weathered, strong rock, local zones of fine-grained biotite	BR		55.00	7	ROTO SONIC	5.00 5.00		
60		60.00 - 65.00 (GNEISS), BEDROCK; biotite, feldspar, quartz, light gray to white, well foliated, poorly jointed, veing quartz, fine-to medium-grained, fresh to slightly weathered, strong rock, local zones of fine grained biotite	BR		60.00	8	ROTO SONIC	4.00 5.00		
65		Boring completed at 65.00 ft								
70										
75										
80										
85										
90										
95										
100										

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21



BOREHOLE RECORD MCDONOUGH MASTER LIST (2).GPJ PIEDMONT.GDT 2/3/21



# RECORD OF BOREHOLE B-111D

SHEET 1 of 2






PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.00 ft  
LOCATION: West of DGWC-5

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/1/20  
DATE COMPLETED: 11/3/20

NORTHING: 1394303.6  
EASTING: 2202956.4  
GS ELEVATION: 788.99 ft  
TOC ELEVATION: 791.84 ft

DEPTH W.L.: 8.9  
ELEVATION W.L.: 755.30  
DATE W.L.: 11/3/2020  
TIME W.L.: 0815

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) (3) (1) GPJ PIEDMONT GDT 2/10/21

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM AND NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC				
					DEPTH (ft)							
0		0.00 - 10.00 Air Knife; Fill	FILL						Stick-up – 	<b>B-111D</b> Borehole Diameter: 6" <b>WELL CASING</b> Interval: 0'-85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 74.15'-84.15' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.1'-84.15' Type: FilterSil Quantity: 3-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 68.7'-72.1' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-68.7' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>		
5												
10		10.00 - 15.00 (ML), SILT; tan to brown, trace fine to coarse sand, moist to wet, soft, low plasticity, w<Pl, saprolite			ML		10.00	1			ROTO SONIC	
15		15.00 - 20.00 (ML), SILT; gray and green to brown, low plasticity, w<PL, moist, soft to firm	ML		15.00	10.00 10.00						
20		20.00 - 26.00 (ML), SILT; gray and green to brown, low plasticity, w<PL, moist, soft to firm, more saprolitic	ML		20.00	8.00 8.00						
25		26.00 - 27.00 (TWR), TRANSITIONALLY WEATHERED ROCK; silt, gray and green to brown, low plasticity, w<PL, moist, soft to firm, saprolitic, locally contains gravels of augen biotite gneiss	TWR		26.00	2	ROTO SONIC		AquaGuard Bentonite – Grout			
30		27.00 - 34.00 (GNEISS), BEDROCK; quartz, feldspar, biotite, white to dark gray, moderately weathered, medium strong, iron staining, locally contains augened feldspars	BR		27.00			3		1.00 2.00		
					4			2.20 4.00				
35		34.00 - 51.50 (GNEISS), BEDROCK; biotite, quartz, feldspar, white to light gray, well foliated, poorly jointed, fresh to slightly weathered, medium strong, iron staining, locally contains K-spar augens	BR		34.00	5	ROTO SONIC	1.70 6.00				
40												
45								6	ROTO SONIC	10.00 10.00		
50												

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-111D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 1668496.18  
DRILLED DEPTH: 85.00 ft  
LOCATION: West of DGWC-5

DRILL RIG: Geoprobe 8140LC  
DATE STARTED: 11/1/20  
DATE COMPLETED: 11/3/20

NORTHING: 1394303.6  
EASTING: 2202956.4  
GS ELEVATION: 788.99 ft  
TOC ELEVATION: 791.84 ft

DEPTH W.L.: 8.9  
ELEVATION W.L.: 755.30  
DATE W.L.: 11/3/2020  
TIME W.L.: 0815

BOREHOLE RECORD MCDONOUGH MASTER LIST (2) (3) (1).GPJ PIEDMONT.GDT 2/10/21

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
50			BR							<b>B-111D</b> Borehole Diameter: 6" <b>WELL CASING</b> Interval: 0'-85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw fit with rubber seam <b>WELL SCREEN</b> Interval: 74.15'-84.15' Material: Schedule 40 PVC Diameter: 2" Slot Size: .010" End Cap: Schedule 40 PVC <b>FILTER PACK</b> Interval: 72.1'-84.15' Type: FilterSil Quantity: 3-50 lbs bags <b>FILTER PACK SEAL</b> Interval: 68.7'-72.1' Type: 3/8" Uncoated Pel-Plug Quantity: 1-5 gallon bucket <b>ANNULUS SEAL</b> Interval: 0'-68.7' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>NOTES</b>
51.50 - 58.00		(GNEISS), BEDROCK; feldspar, quartz, biotite, white to light gray, well foliated, poorly jointed, fresh to slightly weathered, medium strong, locally contains epidote	BR		51.50	7	ROTO SONIC	7.00 10.00		
55			BR							
58.00 - 85.00		(GNEISS), BEDROCK; biotite, feldspar, quartz, white to light gray, well foliated, poorly jointed, fresh to slightly weathered, medium to strong,			58.00	8	ROTO SONIC	5.00 5.00		
60						9	ROTO SONIC	5.00 5.00		
65						10	ROTO SONIC	5.00 5.00		
70			BR						3/8" Uncoated Pel-Plug	
75									Sand Filter Pack	
80						11	ROTO SONIC	10.00 10.00	U-Pack Screen	
85		Boring completed at 85.00 ft								
90										
95										
100										

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Fred Dorse

GA INSPECTOR: Michael Boatman, PG  
CHECKED BY: Timothy Richards, PG  
DATE: 2/3/21





# RECORD OF BOREHOLE B-112D






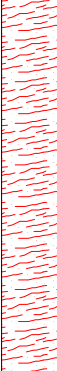
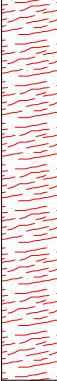
SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 55.00 ft  
LOCATION: Offset of DGWC-69

DRILL RIG: TSi 150CC  
DATE STARTED: 3/21/21  
DATE COMPLETED: 3/22/21

NORTHING: 1,391,564.2  
EASTING: 2,200,664.1  
GS ELEVATION: 765.98  
TOC ELEVATION: 765.58 ft

DEPTH W.L.: 6.87  
ELEVATION W.L.: 758.71  
DATE W.L.: 4/12/2021  
TIME W.L.: 12:18

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0	765	0.00 - 7.00 CL, Silty CLAY, low plasticity; red brown; soft, dry to moist, W<PL	CL						8" Flush Mount	<b>WELL CASING</b> Interval: 0-44.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 44.7-54.7' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 54.7-55'  <b>FILTER PACK</b> Interval: 42.5-55' Type: #1 Filter Sand Quantity: 4-50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 38.5-42.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-38.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 8" Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
5	760	7.00 - 11.50 SP, SAND with trace silt and gravels, non-plasticity fine to coarse; blue-gray; soft to firm, moist, W<PL	SP		759.0 7.00		Hand Auger	0.00 10.00		
10	755	11.50 - 12.50 ML, Clayey SILT, low plasticity; brown to gray-brown; soft, moist, W<PL	ML		754.5 11.50 753.5					
15	750	12.50 - 16.00 SM, SILTY SAND, non to low plasticity; tan to brown to beige; loose to compact, dry, W<PL	SM		750.0 12.50	1		9.00 10.00	AquaGuard Grout	
20	745	16.00 - 20.00 TWR, Transitionally Weathered Rock; No recovery; Wash out; Driller noted the material was hard enough to drill with water(coring), but soft enough to wash away.	TWR		746.0 16.00					
25	740	20.00 - 30.00 Slightly to moderately weathered, well foliated, well jointed, light gray to gray, fine-medium grained, medium strong, quartz-feldspar-biotite GNEISS; locally contains vein quartz and augenated potassium feldspar (K-spar)	BR		736.0 20.00	2		3.80 10.00		
30	735	30.00 - 40.00 Fresh to slightly weathered, well foliated, poorly jointed, light gray to gray, fine-medium grained, weak to medium strong, quartz-feldspar-biotite GNEISS; locally contains epidote	BR		726.0 30.00	3		7.80 10.00	Bentonite Seal	
40		Log continued on next page								

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-112D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 55.00 ft  
LOCATION: Offset of DGWC-69

DRILL RIG: TS1 150CC  
DATE STARTED: 3/21/21  
DATE COMPLETED: 3/22/21

NORTHING: 1,391,564.2  
EASTING: 2,200,664.1  
GS ELEVATION: 765.98  
TOC ELEVATION: 765.58 ft

DEPTH W.L.: 6.87  
ELEVATION W.L.: 758.71  
DATE W.L.: 4/12/2021  
TIME W.L.: 12:18

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC			
					DEPTH (ft)						
40	725	40.00 - 50.00 Fresh to moderately weathered, well foliated, poorly jointed, light gray to gray, fine-medium grained, weak to medium strong, quartz-feldspar-biotite GNEISS; locally contains vein quartz and water staining	BR		40.00	4		5.00 10.00	#1 Sand filter pack		<b>WELL CASING</b> Interval: 0-44.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 44.7-54.7' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 54.7-55'  <b>FILTER PACK</b> Interval: 42.5-55' Type: #1 Filter Sand Quantity: 4-50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 38.5-42.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-38.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 8" Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
45	720										
50	715	50.00 - 55.00 Slightly to moderately weathered, well foliated, poorly jointed, light gray to gray, fine-medium grained, medium strong to strong, potassium feldspar, plagioclase, quartz-biotite GNEISS; locally contains epidote, pegmatitic vein quartz, and augened k-spar	BR		716.0 50.00	5		5.00 5.00	0.010" Slotted Schedule 40 PVC		
55	710	Boring completed at 55.00 ft			711.0						
60	705										
65	700										
70	695										
75	690										
80											

**WELL CASING**  
Interval: 0-44.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Joint Type: Flush/Screw

**WELL SCREEN**  
Interval: 44.7-54.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Slot Size: 0.010"  
End Cap: 54.7-55'

**FILTER PACK**  
Interval: 42.5-55'  
Type: #1 Filter Sand  
Quantity: 4-50 lbs bags

**FILTER PACK SEAL**  
Interval: 38.5-42.5'  
Type: 3/8" Uncoated Pel-Plug  
Quantity: 1 - 5 gallon bucket

**ANNULUS SEAL**  
Interval: 0-38.5'  
Type: AquaGuard Bentonite Grout  
Quantity: Approximately 80 gallons

**WELL COMPLETION**  
Pad: 4'x4'x4" Concrete  
Protective Casing: 8" Flush Mount

**DRILLING METHODS**  
Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel)  
Rock Drill: Rotosonic  
Sample Type: Rotosonic

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-113D










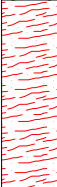
SHEET 1 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 85.00 ft  
LOCATION: Offset of B-72

DRILL RIG: TS1 150CC  
DATE STARTED: 3/22/21  
DATE COMPLETED: 3/30/21

NORTHING: 1,391,264.6  
EASTING: 2,200,719.2  
GS ELEVATION: 758.87  
TOC ELEVATION: 758.22 ft

DEPTH W.L.: 1.46  
ELEVATION W.L.: 756.76  
DATE W.L.: 4/12/2021  
TIME W.L.: 12:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 3.00 CL, Silty CLAY, low plasticity; red-brown; soft, dry to moist, W<PL	CL		755.9 3.00				8" Flush Mount	<b>WELL CASING</b> Interval: 0-74.4' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 74.4-84.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 84.4-84.7'  <b>FILTER PACK</b> Interval: 72.4-84.7' Type: #1 Filter Sand Quantity: 3.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 68.0-72.4' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-68.0' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 8" Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
755		3.00 - 10.00 ML, Clayey SILT, non to low plasticity; dark brown to brown; soft, moist to wet (with depth), W<PL	ML			Hand Auger		0.00 10.00		
750		10.00 - 15.50 ML, Clayey SILT with some sand, low plasticity; dark brown to brown; soft to firm, dry to moist, W<PL	ML		748.9 10.00					
745										
15		15.50 - 20.00 TWR, Transitional Weathered Rock; breaks down to a ML, Clayey SILT with some sand, low plasticity; dark brown to brown; soft to firm, dry to moist, W<PL	TWR		743.4 15.50	1		7.60 10.00		
740										
20		20.00 - 30.00 Highly weathered, poorly foliated, poorly jointed, gray to black, fine-medium grained, very weak to weak, quartz-feldspar-biotite-muscovite SCHIST; locally contains vein quartz and water staining	BR		738.9 20.00	2		3.80 10.00		
735										
25		30.00 - 35.15 Highly weathered, poorly foliated, poorly jointed, gray to black, fine-medium grained, very weak to weak, quartz-feldspar-biotite-muscovite SCHIST; locally contains vein quartz, water staining, and garnets	BR		728.9 30.00					
730										
30		35.15 - 50.00 Fresh to slightly weathered, poorly foliated, white to pink and green, very fine to medium grained, medium strong to very strong, muscovite-plagioclase-k-spar-quartz GNEISS; locally contains vein quartz, epidote, and garnets	BR		723.7 35.15	3		7.00 10.00	AquaGuard Grout	
725										
35										
720										
40		Log continued on next page								

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-113D

SHEET 2 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 85.00 ft  
LOCATION: Offset of B-72

DRILL RIG: TSi 150CC  
DATE STARTED: 3/22/21  
DATE COMPLETED: 3/30/21

NORTHING: 1,391,264.6  
EASTING: 2,200,719.2  
GS ELEVATION: 758.87  
TOC ELEVATION: 758.22 ft

DEPTH W.L.: 1.46  
ELEVATION W.L.: 756.76  
DATE W.L.: 4/12/2021  
TIME W.L.: 12:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
40		35.15 - 50.00 Fresh to slightly weathered, poorly foliated, white to pink and green, very fine to medium grained, medium strong to very strong, muscovite-plagioclase-k-spar-quartz GNEISS; locally contains vein quartz, epidote, and garnets (Continued)	BR							<b>WELL CASING</b> Interval: 0-74.4' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 74.4-84.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 84.4-84.7'  <b>FILTER PACK</b> Interval: 72.4-84.7' Type: #1 Filter Sand Quantity: 3.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 68.0-72.4' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-68.0' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 8" Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Rotasonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotasonic Sample Type: Rotasonic
45						4		6.50 10.00		
50		50.00 - 60.00 Fresh, weakly foliated, poorly jointed, light gray to greenish white, fine to medium grained, medium strong to strong, epidote-muscovite-biotite-feldspar-quartz GNEISS; locally contains garnets and pyrite.	BR		708.9 50.00					
55						5		10.00 10.00		
60		60.00 - 76.00 Fresh, weakly foliated, poorly jointed, green to white to gray, fine to medium grained, medium strong to strong, GNEISS; locally contains vein quartz and garnets	BR		698.9 60.00					
65						6		7.50 10.00		
70			BR							
75		76.00 - 85.00 Fresh to slightly weathered, weak to moderately foliated, poorly jointed, greenish white to gray, fine to medium grained, strong, GNEISS; locally contains folds, vein quartz, and garnets; rock becomes schistose in localized areas.			682.9 76.00	7		8.70 10.00		
80		Log continued on next page								

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21



BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21



# RECORD OF BOREHOLE B-113D

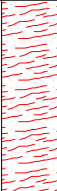

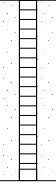
SHEET 3 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 85.00 ft  
LOCATION: Offset of B-72

DRILL RIG: TSi 150CC  
DATE STARTED: 3/22/21  
DATE COMPLETED: 3/30/21

NORTHING: 1,391,264.6  
EASTING: 2,200,719.2  
GS ELEVATION: 758.87  
TOC ELEVATION: 758.22 ft

DEPTH W.L.: 1.46  
ELEVATION W.L.: 756.76  
DATE W.L.: 4/12/2021  
TIME W.L.: 12:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
80		76.00 - 85.00 Fresh to slightly weathered, weak to moderately foliated, poorly jointed, greenish white to gray, fine to medium grained, strong, GNEISS; locally contains folds, vein quartz, and garnets; rock becomes schistose in localized areas. (Continued)	BR			8		$\frac{4.50}{5.00}$	<div>0.010" Slotted Schedule 40 PVC</div> <div>Sump</div> 	<b>WELL CASING</b> Interval: 0-74.4' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 74.4-84.4' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 84.4-84.7'  <b>FILTER PACK</b> Interval: 72.4-84.7' Type: #1 Filter Sand Quantity: 3.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 68.0-72.4' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-68.0' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 8" Flush Mount  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
675		Boring completed at 85.00 ft			673.9					
85										
90										
95										
100										
105										
110										
115										
120										

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-115D

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 80.00 ft  
LOCATION: South of overflow parking

DRILL RIG: TSi 150CC  
DATE STARTED: 3/19/21  
DATE COMPLETED: 3/20/21

NORTHING: 1,391,265.3  
EASTING: 2,202,580.7  
GS ELEVATION: 786.43  
TOC ELEVATION: 789.17 ft

DEPTH W.L.: 19.32  
ELEVATION W.L.: 769.85  
DATE W.L.: 4/7/2021  
TIME W.L.: 14:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0	785	0.00 - 10.00 FILL- Backfilled with cuttings from air knife clearance								<b>WELL CASING</b> Interval: 0-69.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 69.2-79.2' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 79.2-79.5'  <b>FILTER PACK</b> Interval: 66.7-79.5' Type: #1 Filter Sand Quantity: 4 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 62.5-66.7' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-62.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 100 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
5	780				776.4		Air Knife	0.00 10.00		
10	775	10.00 - 13.00 CL, Silty CLAY with trace organics, low to moderate plasticity; dark brown; fill; soft to firm, moist, W<PL	CL		10.00					
15	770	13.00 - 18.00 SC, Clayey SAND, low plasticity, fine to coarse; dark red brown to red brown; fill; soft/loose, dry to moist, W<PL	SC		773.4	13.00		10.00		
20	765	18.00 - 20.00 ML, Clayey SILT, low plasticity; tan; soft, moist, W<PL	ML		768.4	18.00		10.00		
25	760	20.00 - 25.00 TWR, Transitional Weathered Rock; breaks down to a ML, Sandy SILT with trace coobles, non to low plasticity; light brown to brown; soft/loose, moist, W<PL	TWR		766.4	20.00				
30	755	25.00 - 30.00 Highly to moderately weathered, well foliated, well jointed, dark gray to black, fine to medium grained, very weak to weak, muscovite SCHIST; locally is water stained	BR		761.4	25.00		8.50 10.00		
35	750	30.00 - 50.00 Fresh to moderately weathered, well foliated, well jointed, green to gray to black, fine to medium grained, very weak to medium strong, muscovite SCHIST; locally interlayered with a epidote- quartz-muscovite schistose GNEISS	BR		756.4	30.00		7.50 10.00	AquaGuard - Grout	
40		Log continued on next page								

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-115D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 80.00 ft  
LOCATION: South of overflow parking

DRILL RIG: TS1 150CC  
DATE STARTED: 3/19/21  
DATE COMPLETED: 3/20/21

NORTHING: 1,391,265.3  
EASTING: 2,202,580.7  
GS ELEVATION: 786.43  
TOC ELEVATION: 789.17 ft

DEPTH W.L.: 19.32  
ELEVATION W.L.: 769.85  
DATE W.L.: 4/7/2021  
TIME W.L.: 14:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
40		30.00 - 50.00 Fresh to moderately weathered, well foliated, well jointed, green to gray to black, fine to medium grained, very weak to medium strong, muscovite SCHIST; locally interlayered with a epidote-quartz-muscovite schistose GNEISS (Continued)	BR							<b>WELL CASING</b> Interval: 0-69.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 69.2-79.2' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 79.2-79.5'  <b>FILTER PACK</b> Interval: 66.7-79.5' Type: #1 Filter Sand Quantity: 4 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 62.5-66.7' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-62.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 100 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
45	745					4		6.50 10.00		
50	740				736.4					
55	735	50.00 - 70.00 Fresh to slightly weathered, well foliated, well jointed, light gray to green, fine to medium grained, weak to strong, chlorite-quartz-muscovite SCHIST	BR		50.00					
60	730					5		6.50 10.00		
65	725									
70	720									
75	715	70.00 - 80.00 Fresh to Slightly weathered, weak to moderately foliated, poorly jointed, gray to black, fine grained, medium strong to strong, quartz-biotite-muscovite SCHIST; locally contains pyrite and garnets	BR		716.4			8.00 10.00		
80	710				70.00	7		10.00 10.00		
		Boring completed at 80.00 ft			706.4					

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21



BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21



# RECORD OF BOREHOLE B-116D









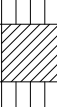


SHEET 1 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 90.00 ft  
LOCATION: Offset DGWC-70A

DRILL RIG: TS1 150CC  
DATE STARTED: 3/7/21  
DATE COMPLETED: 3/8/21

NORTHING: 1,390,483.7  
EASTING: 2,200,611.0  
GS ELEVATION: 805.31  
TOC ELEVATION: 807.82 ft

DEPTH W.L.: 40.82  
ELEVATION W.L.: 767.00  
DATE W.L.: 4/6/2021  
TIME W.L.: 15:11

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM AND NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0	805	0.00 - 3.00 CL, Silty CLAY, low plasticity; red brown; soft to firm, moist, W<PL	CL		802.3					<b>WELL CASING</b> Interval: 0-79.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 79.2-89.2' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 89.2-89.5'  <b>FILTER PACK</b> Interval: 75.5-89.5' Type: #1 Filter Sand Quantity: 4.5 - 50 lbs bag  <b>FILTER PACK SEAL</b> Interval: 70.6-75.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-70.6' Type: AquaGuard Bentonite Grout Quantity: Approximately 120 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotasonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotasonic Sample Type: Rotasonic
		3.00 - 6.00 ML, Clayey SILT with trace to some fine to coarse sand, non plasticity; brown; soft/ loose, dry to moist, W<PL	ML		3.00					
5	800	6.00 - 10.00 SM, SILTY SAND, non to low plasticity; yellow-brown to tan; loose, dry, W<PL	SM		799.3	Hand Auger		0.00 10.00		
		10.00 - 11.00 CL, Silty CLAY with some silt, low plasticity; red brown to brown; soft, moist, W<PL	CL		795.3					
10	795	11.00 - 20.00 ML, Clayey SILT, non plasticity; brown to gray-brown; soft/ loose, moist, W<PL; locally contains books of muscovite	ML		794.3					
		20.00 - 21.50 CL, Silty CLAY with some fine sand, low plasticity; orange brown; soft, moist, W~PL	CL		785.3					
15	790	21.50 - 30.00 ML, Clayey SILT with trace clay and fine sand, non plasticity; brown to gray-brown; soft/ loose, moist, W<PL; locally contains books of muscovite	ML		783.8	1		13.50 10.00		
		30.00 - 40.00 ML, Clayey SILT with trace fine sand and trace to some clay, non to low plasticity; gray; soft, moist, W<PL to W~PL	ML		775.3					
20	785				775.3					
25	780				775.3	2		15.00 10.00		
30	775				775.3					
35	770				775.3	3		12.00 10.00	AquaGuard Grout	
40		Log continued on next page			765.3					

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-116D

SHEET 2 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 90.00 ft  
LOCATION: Offset DGWC-70A

DRILL RIG: TSi 150CC  
DATE STARTED: 3/7/21  
DATE COMPLETED: 3/8/21

NORTHING: 1,390,483.7  
EASTING: 2,200,611.0  
GS ELEVATION: 805.31  
TOC ELEVATION: 807.82 ft

DEPTH W.L.: 40.82  
ELEVATION W.L.: 767.00  
DATE W.L.: 4/6/2021  
TIME W.L.: 15:11

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC		
					DEPTH (ft)					
40	765	40.00 - 50.00 ML, Clayey SILT with some fine to coarse sand, non to low plasticity; gray to gray-brown; soft (becoming firm to stiff with depth), moist to wet, W<PL	ML		40.00	4		12.00 10.00		<b>WELL CASING</b> Interval: 0-79.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 79.2-89.2' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 89.2-89.5'  <b>FILTER PACK</b> Interval: 75.5-89.5' Type: #1 Filter Sand Quantity: 4.5 - 50 lbs bag  <b>FILTER PACK SEAL</b> Interval: 70.6-75.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-70.6' Type: AquaGuard Bentonite Grout Quantity: Approximately 120 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
45	760									
50	755	50.00 - 54.90 TWR, Transitional Weathered Rock; breaks down to a ML, Clayey SILT with some fine to coarse sand, non to low plasticity; gray to gray-brown; soft (becoming firm to stiff with depth), moist to wet, W<PL	TWR		755.3 50.00	5		5.10 10.00		
55	750	54.90 - 90.00 Fresh to slightly weathered, well foliated, well jointed, gray to black, fine to medium grained, weak to medium strong, garnet-chlorite-quartz-biotite-muscovite SCHIST	BR		750.4 54.90					
60	745					6		7.00 10.00		
65	740									
70	735					7		8.00 10.00		
75	730									
80		Log continued on next page								

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-116D

SHEET 3 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 90.00 ft  
LOCATION: Offset DGWC-70A

DRILL RIG: TS1 150CC  
DATE STARTED: 3/7/21  
DATE COMPLETED: 3/8/21

NORTHING: 1,390,483.7  
EASTING: 2,200,611.0  
GS ELEVATION: 805.31  
TOC ELEVATION: 807.82 ft

DEPTH W.L.: 40.82  
ELEVATION W.L.: 767.00  
DATE W.L.: 4/6/2021  
TIME W.L.: 15:11

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
80	725	54.90 - 90.00 Fresh to slightly weathered, well foliated, well jointed, gray to black, fine to medium grained, weak to medium strong, garnet-chlorite-quartz-biotite-muscovite SCHIST ( <i>Continued</i> )	BR			8		9.00 10.00	0.010" Slotted Schedule 40 PVC	<b>WELL CASING</b> Interval: 0-79.2' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 79.2-89.2' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 89.2-89.5'  <b>FILTER PACK</b> Interval: 75.5-89.5' Type: #1 Filter Sand Quantity: 4.5 - 50 lbs bag  <b>FILTER PACK SEAL</b> Interval: 70.6-75.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-70.6' Type: AquaGuard Bentonite Grout Quantity: Approximately 120 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
85	720									
90	715	Boring completed at 90.00 ft			715.3				#1 Filter Sand	
95	710								Sump	
100	705									
105	700									
110	695									
115	690									
120										

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-117D

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 75.00 ft  
LOCATION: Offset of DGWC-71

DRILL RIG: TSi 150CC  
DATE STARTED: 3/17/21  
DATE COMPLETED: 3/17/21

NORTHING: 1,393,963.8  
EASTING: 2,201,727.3  
GS ELEVATION: 861.23  
TOC ELEVATION: 863.82 ft

DEPTH W.L.: 27.88  
ELEVATION W.L.: 835.94  
DATE W.L.: 4/7/2021  
TIME W.L.: 9:35

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0	860	0.00 - 10.00 FILL- Backfilled with cuttings from air knife clearance								
5	855					Air Knife		0.00 10.00		
10	850	10.00 - 16.00 SM, SILTY SAND, low plasticity; red brown; soft/loose, moist, W<PL	SM		851.2 10.00	1		7.00 9.00		
15	845	16.00 - 19.00 ML, Clayey SILT with trace sand, low plasticity; light gray to white; soft, moist, W<PL	ML		845.2 16.00					
20	840	19.00 - 29.00 SM, SILTY SAND, low plasticity, very fine; light gray to tannish white; soft, moist, W<PL	SM		842.2 19.00	2		9.50 10.00		
25	835									
30	830	29.00 - 39.00 SM, SILTY SAND with trace gravels, low plasticity, fine to coarse; light gray to tannish white; soft, moist (becoming dry with depth), W<PL	SM		832.2 29.00	3		10.00 10.00		
35	825									
40			SM		822.2 39.00	4		9.00 10.00		

Log continued on next page

AquaGuard  
Grout

**WELL CASING**  
Interval: 0-64.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Joint Type: Flush/Screw

**WELL SCREEN**  
Interval: 64.7-74.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Slot Size: 0.010"  
End Cap: 74.7-75'

**FILTER PACK**  
Interval: 62.5- 75'  
Type: #1 Filter Sand  
Quantity: 4 - 50 lbs bags

**FILTER PACK SEAL**  
Interval: 58.5-62.5'  
Type: 3/8" Uncoated  
Pel-Plug  
Quantity: 1 - 5 gallon bucket

**ANNULUS SEAL**  
Interval: 0-58.5'  
Type: AquaGuard Bentonite  
Grout  
Quantity: Approximately 80  
gallons

**WELL COMPLETION**  
Pad: 4'x4'x4" Concrete  
Protective Casing: 4'x4'  
Aluminium

**DRILLING METHODS**  
Soil Drill: Rotasonic (6 inch  
casing by 4 inch core  
barrel)  
Rock Drill: Rotasonic  
Sample Type: Rotasonic

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-117D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 75.00 ft  
LOCATION: Offset of DGWC-71

DRILL RIG: TS1 150CC  
DATE STARTED: 3/17/21  
DATE COMPLETED: 3/17/21

NORTHING: 1,393,963.8  
EASTING: 2,201,727.3  
GS ELEVATION: 861.23  
TOC ELEVATION: 863.82 ft

DEPTH W.L.: 27.88  
ELEVATION W.L.: 835.94  
DATE W.L.: 4/7/2021  
TIME W.L.: 9:35

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
40		39.00 - 41.00 SM, SILTY SAND with trace gravels, low plasticity, fine to coarse; light gray to tannish white; compact/dense to firm/stiff, moist (becoming dry with depth), W<PL (Continued)	SM		820.2 41.00					<b>WELL CASING</b> Interval: 0-64.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 64.7-74.7' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 74.7-75'  <b>FILTER PACK</b> Interval: 62.5- 75' Type: #1 Filter Sand Quantity: 4 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 58.5-62.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-58.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4'x4' Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotasonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotasonic Sample Type: Rotasonic
45		41.00 - 49.00 TWR, Transitional Weathered Rock; breaks down to abreaks down to aSM, SILTY SAND with trace gravels, low plasticity, fine to coarse; light gray to tannish white; compact/dense to firm/stiff, moist (becoming dry with depth), W<PL	TWR			4		9.00 10.00		
50		49.00 - 75.00 Fresh to moderately weathered, well foliated, moderately jointed, gray to dark gray, fine to medium grained, medium strong, biotite-quartz-feldspar GNEISS; locally contains pegmatite and quartz veins			812.2 49.00					
55						5		7.50 10.00		
60										
65						6		8.50 10.00		
70										
75						7		4.50 6.00		
75		Boring completed at 75.00 ft			786.2					
80										

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-118


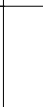













SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 75.00 ft  
LOCATION: West of gas pipeline

DRILL RIG: TSi 150CC  
DATE STARTED: 3/8/21  
DATE COMPLETED: 3/9/21

NORTHING: 1,391,219.3  
EASTING: 2,200,449.7  
GS ELEVATION: 804.99  
TOC ELEVATION: 807.70 ft

DEPTH W.L.: 50.65  
ELEVATION W.L.: 757.05  
DATE W.L.: 4/6/2021  
TIME W.L.: 9:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0	805	0.00 - 3.00 CL, Silty CLAY with trace to some fine sand, low plasticity; dark red; soft, dry to moist, W<PL	CL		802	Hand Auger		0.00 10.00		<b>WELL CASING</b> Interval: 0-64.85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 64.85-74.85' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 74.85-75.15'  <b>FILTER PACK</b> Interval: 61.8-75.15 Type: #1 Filter Sand Quantity: 4 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 56.6-61.8' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-56.6' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotasonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotasonic Sample Type: Rotasonic
5	800	3.00 - 10.00 SP, SAND, non plasticity, uniformly graded; yellow-orange; loose, dry to moist, W<PL	SP		3.00					
10	795	10.00 - 18.50 CL, Silty CLAY with trace to some fine sand, low plasticity; red-orange and white; soft, moist, W<PL	CL		795 10.00	1		5.00 10.00		
15	790									
20	785	18.50 - 20.00 ML, Clayey SILT with trace sand and fine gravels, non plasticity; olive brown to brown; loose, dry, W<PL	ML		786.5 18.50					
		20.00 - 25.00 SP, SAND, non plasticity, fine to coarse, poorly graded; tannish-orange; loose, moist, W<PL	SP		785 20.00					
25	780	25.00 - 30.00 SM, SILTY SAND, low plasticity, fine to medium; orange to tan; loose/soft, moist, W<PL	SM		780 25.00	2		7.50 10.00		
30	775	30.00 - 32.00 ML, Sandy SILT, non plasticity; brown to dark brown; soft, moist, W<PL	ML		775 30.00	3		2.50 2.00		
35	770	32.00 - 40.00 TWR, Transitional Weathered Rock; breaks down to a SW-SM, SAND AND SILT with some gravels, non to low plasticity, fine to coarse; white; loose, wet, W<PL	TWR		773 32.00	4		1.00 6.00	AquaGuard Grout	
40	765				765	5		1.50 2.00		

Log continued on next page

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21



BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21



# RECORD OF BOREHOLE B-118

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 75.00 ft  
LOCATION: West of gas pipeline

DRILL RIG: TSi 150CC  
DATE STARTED: 3/8/21  
DATE COMPLETED: 3/9/21

NORTHING: 1,391,219.3  
EASTING: 2,200,449.7  
GS ELEVATION: 804.99  
TOC ELEVATION: 807.70 ft

DEPTH W.L.: 50.65  
ELEVATION W.L.: 757.05  
DATE W.L.: 4/6/2021  
TIME W.L.: 9:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC		
					DEPTH (ft)					
40	765	40.00 - 50.00 Slightly to moderately weathered, well foliated, moderately jointed, tan to white to gray, fine to medium grained, medium strong, plagioclase-K-spar-biotite-quartz GNEISS	BR		40.00	6		4.80 10.00		<b>WELL CASING</b> Interval: 0-64.85' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 64.85-74.85' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 74.85-75.15'  <b>FILTER PACK</b> Interval: 61.8-75.15 Type: #1 Filter Sand Quantity: 4 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 56.6-61.8' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-56.6' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4"x4"x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
45	760									
50	755	50.00 - 60.00 Moderately weathered, well foliated, well jointed, tan to white to brown, fine to medium grained, weak to medium strong, plagioclase-K-spar-biotite-quartz GNEISS	BR		755 50.00	7		2.50 10.00		
55	750									
60	745	60.00 - 75.00 Fresh to slightly weathered, well foliated, poorly jointed, greenish gray to gray, fine to medium grained, medium strong, epidote-biotite-feldspar-quartz GNEISS	BR		745 60.00	8		0.00 10.00		
65	740									
70	735		BR			9		2.50 5.00		
75	730									
		Boring completed at 75.00 ft			730					
80	725									

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-119D














SHEET 1 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 105.00 ft  
LOCATION: Offset of B-118

DRILL RIG: TS1 150CC  
DATE STARTED: 3/10/21  
DATE COMPLETED: 3/16/21

NORTHING: 1,391,236.4  
EASTING: 2,200,446.6  
GS ELEVATION: 804.53  
TOC ELEVATION: 807.15 ft

DEPTH W.L.: 49.94  
ELEVATION W.L.: 757.21  
DATE W.L.: 4/5/2021  
TIME W.L.: 13:37

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 12.50 CL, Sandy CLAY, low plasticity, fine to coarse; red to red-orange; soft/loose, dry to moist, W<PL	CL							
5	800					Hand Auger		0.00 10.00		
10	795									
15	790	12.50 - 18.00 ML, Clayey SILT with some fine sand, low plasticity; pink-brown to tan; loose, dry to moist, W<PL	ML		792 12.50	1		7.50 9.00		
20	785	18.00 - 19.00 SP, SAND with trace to some silt, low plasticity, uniformly graded; white to tan; loose, dry, W<PL	SP		786.5 18.00 785.5					
		19.00 - 20.00 SC, CLAYEY SAND, moderate plasticity, fine to medium; dark brown; soft, moist, W~PL	SC		19.00 784.5					
		20.00 - 21.50 SP, SAND with some silt, low plasticity, fine; white to tan to gray; loose, dry to moist, W<PL	SP		20.00 783					
		21.50 - 23.50 SM, SILTY SAND, low plasticity; beige brown; soft, moist to wet, W~PL	SM		21.50 781					
25	780	23.50 - 27.50 ML, Clayey SILT with some fine sand, moderate plasticity; light to dark brown; soft/loose, dry to moist, W<PL	ML		23.50 777	2		9.50 10.00		
		27.50 - 29.00 SP, SAND with trace to some silt, non plasticity, fine to coarse; white to beige; loose, dry, W<PL	SP		27.50 775.5					
30	775	29.00 - 39.00 ML, Sandy SILT with trace gravels, low plasticity, fine; tan to light brown; loose, dry to moist, W<PL	ML		29.00	3		9.50 10.00		
35	770									
40	765		ML		765.5 39.00	4		4.50 6.00		

Log continued on next page

AquaGuard  
Grout

**WELL CASING**  
Interval: 0-94.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Joint Type: Flush/Screw

**WELL SCREEN**  
Interval: 94.7-104.7'  
Material: Schedule 40 PVC  
Diameter: 2"  
Slot Size: 0.010"  
End Cap: 104.7-105'

**FILTER PACK**  
Interval: 91.5-105'  
Type: #1 Filter Sand  
Quantity: 4.5 - 50 lbs bags

**FILTER PACK SEAL**  
Interval: 86.5-91.5'  
Type: 3/8" Uncoated  
Pel-Plug  
Quantity: 1 - 5 gallon bucket

**ANNULUS SEAL**  
Interval: 0-86.5'  
Type: AquaGuard Bentonite  
Grout  
Quantity: Approximately 160  
gallons

**WELL COMPLETION**  
Pad: 4'x4'x4" Concrete  
Protective Casing: 4"x4"  
Aluminium

**DRILLING METHODS**  
Soil Drill: Rotosonic (6 inch  
casing by 4 inch core  
barrel)  
Rock Drill: Rotosonic  
Sample Type: Rotosonic

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-119D

SHEET 2 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 105.00 ft  
LOCATION: Offset of B-118

DRILL RIG: TSi 150CC  
DATE STARTED: 3/10/21  
DATE COMPLETED: 3/16/21

NORTHING: 1,391,236.4  
EASTING: 2,200,446.6  
GS ELEVATION: 804.53  
TOC ELEVATION: 807.15 ft

DEPTH W.L.: 49.94  
ELEVATION W.L.: 757.21  
DATE W.L.: 4/5/2021  
TIME W.L.: 13:37

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
40		39.00 - 45.00 ML, Sandy SILT with trace gravels and cobbles, low plasticity, fine; tan to light brown; loose, dry to wet, W<PL ( <i>Continued</i> )	ML			4		4.50 6.00		<b>WELL CASING</b> Interval: 0-94.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 94.7-104.7' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 104.7-105'  <b>FILTER PACK</b> Interval: 91.5-105' Type: #1 Filter Sand Quantity: 4.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 86.5-91.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-86.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 160 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
45	760	45.00 - 50.00 TWR, Transitional Weathered Rock; breaks down to a SM, SILTY SAND with trace gravels(weatherd gneiss) low plasticity; light gray to tan; firm/compact, moist to wet, W<PL	TWR		759.5 45.00	5		6.00 5.00		
50	755	50.00 - 53.40 Slightly to moderately weathered, well foliated, moderately jointed, gray to brown, fine grained, weak to medium strong, muscovite-quartz-feldspar-biotite GNEISS	BR		754.5 50.00					
55	750	53.40 - 60.00 TWR, Transitional Weathered Rock; breaks down to a SM, SILTY SAND, low plasticity; grayish brown to gray; loose, dry to moist, W<PL	TWR		751.1 53.40	6		6.20 10.00		
60	745	60.00 - 67.00 Slightly to moderately weathered, well foliated, moderately jointed, gray to brown, fine grained, weak to medium strong, muscovite-quartz-feldspar-biotite GNEISS	BR		744.5 60.00	7		4.00 10.00		
65	740									
70	735	67.00 - 87.00 Fresh to slightly weathered, moderately foliated, poorly jointed, dark gray to black, very fine to fine grained, medium strong, feldspar-quartz-biotite GNEISS	BR		737.5 67.00	8		8.50 10.00		
75	730									
80	725									

Log continued on next page

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21



BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21



# RECORD OF BOREHOLE B-119D

SHEET 3 of 3

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 105.00 ft  
LOCATION: Offset of B-118

DRILL RIG: TS1 150CC  
DATE STARTED: 3/10/21  
DATE COMPLETED: 3/16/21

NORTHING: 1,391,236.4  
EASTING: 2,200,446.6  
GS ELEVATION: 804.53  
TOC ELEVATION: 807.15 ft

DEPTH W.L.: 49.94  
ELEVATION W.L.: 757.21  
DATE W.L.: 4/5/2021  
TIME W.L.: 13:37

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
80		67.00 - 87.00 Fresh to slightly weathered, moderately foliated, poorly jointed, dark gray to black, very fine to fine grained, medium strong, feldspar-quartz-biotite GNEISS ( <i>Continued</i> )	BR							<b>WELL CASING</b> Interval: 0-94.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 94.7-104.7' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 104.7-105'  <b>FILTER PACK</b> Interval: 91.5-105' Type: #1 Filter Sand Quantity: 4.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 86.5-91.5' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-86.5' Type: AquaGuard Bentonite Grout Quantity: Approximately 160 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
85	720				717.5	9		7.00 10.00		
		87.00 - 90.00 Fresh to slightly weathered, poor to moderately foliated, poorly jointed, dark gray to black, medium grained, medium strong, chlorite-epidote-quartz-feldspar-biotite GNEISS	BR		87.00					
90	715				714.5				Bentonite Seal # 1 Filter Sand	
		90.00 - 105.00 Fresh to slightly weathered, foliated, poorly jointed, light gray to dark gray, fine to medium grained, medium strong to strong, feldspar-biotite-quartz GNEISS; locally contains garnets and k-spar augens	BR		90.00					
95	710					10		9.00 10.00		0.010" Slotted Schedule 40 PVC  Sump -
100	705									
						11		4.90 5.00		
105	700	Boring completed at 105.00 ft			699.5					
110	695									
115	690									
120	685									

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE B-120D

SHEET 1 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 70.00 ft  
LOCATION: Offset of B-3

DRILL RIG: TS1 150CC  
DATE STARTED: 3/5/21  
DATE COMPLETED: 3/6/21

NORTHING: 1,394,047.2  
EASTING: 2,202,436.4  
GS ELEVATION: 834.03  
TOC ELEVATION: 836.42 ft

DEPTH W.L.: 33.76  
ELEVATION W.L.: 802.66  
DATE W.L.: 4/9/2021  
TIME W.L.: 12:26

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM AND NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 10.00 FILL- Backfilled with cuttings from air knife clearance								<b>WELL CASING</b> Interval: 0-59' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw  <b>WELL SCREEN</b> Interval: 59-69' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 69.0-69.3'  <b>FILTER PACK</b> Interval: 56.0-69.3' Type: #1 Filter Sand Quantity: 5.5 - 50 lbs bags  <b>FILTER PACK SEAL</b> Interval: 53-56' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket  <b>ANNULUS SEAL</b> Interval: 0-53' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons  <b>WELL COMPLETION</b> Pad: 4'x4'x4" Concrete Protective Casing: 4"x4" Aluminium  <b>DRILLING METHODS</b> Soil Drill: Rotosonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotosonic Sample Type: Rotosonic
830						Air Knife		0.00 10.00		
5										
825										
10		10.00 - 20.00 ML, Clayey SILT with trace medium to coarse sand, non to low plasticity; tan to brown; loose, dry to moist, W<PL	ML		824 10.00	1		6.80 10.00		
820										
15										AquaGuard - Grout
815										
20		20.00 - 27.00 SM, SILTY SAND with some gravels, non plasticity; light gray to gray; loose, dry to moist, W<PL	SM		814 20.00	2		10.00 10.00		
810										
25										
805										
30		27.00 - 30.00 ML, Clayey SILT with trace medium to coarse sand, non to low plasticity; tan to brown; loose, dry to moist, W<PL	ML		807 27.00	3		8.00 10.00		
35		30.00 - 36.00 SM, SILTY SAND with trace fine to coarse gravels, non plasticity; tan to brown; compact to dense, dry to moist, W<PL	SM		804 30.00					
800										Log continued on next page
36.00 - 40.00		TWR, Transitional Weathered Rock; breaks down to a SM, SILTY SAND with trace fine to coarse gravels, non plasticity; olive to tan to brown; compact to dense, dry to moist, W<PL	TWR		798 36.00					
795					794					
40										

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21



BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21



# RECORD OF BOREHOLE B-120D

SHEET 2 of 2

PROJECT: Plant McDonough  
PROJECT NUMBER: 166849621  
DRILLED DEPTH: 70.00 ft  
LOCATION: Offset of B-3

DRILL RIG: TSi 150CC  
DATE STARTED: 3/5/21  
DATE COMPLETED: 3/6/21

NORTHING: 1,394,047.2  
EASTING: 2,202,436.4  
GS ELEVATION: 834.03  
TOC ELEVATION: 836.42 ft

DEPTH W.L.: 33.76  
ELEVATION W.L.: 802.66  
DATE W.L.: 4/9/2021  
TIME W.L.: 12:26

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			PIEZOMETER DIAGRAM and NOTES	PIEZOMETER CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC		
					DEPTH (ft)					
40		40.00 - 70.00 Fresh to slightly weatherd, well foliated, poorly jointed, white to dark gray, fine to coarse grained, biotite-feldspar-quartz GNEISS; locally the felspars are augened	BR		40.00			<p><b>WELL CASING</b> Interval: 0-59' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Screw</p> <p><b>WELL SCREEN</b> Interval: 59-69' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 69.0-69.3'</p> <p><b>FILTER PACK</b> Interval: 56.0-69.3' Type: #1 Filter Sand Quantity: 5.5 - 50 lbs bags</p> <p><b>FILTER PACK SEAL</b> Interval: 53-56' Type: 3/8" Uncoated Pel-Plug Quantity: 1 - 5 gallon bucket</p> <p><b>ANNULUS SEAL</b> Interval: 0-53' Type: AquaGuard Bentonite Grout Quantity: Approximately 80 gallons</p> <p><b>WELL COMPLETION</b> Pad: 4"x4"x4" Concrete Protective Casing: 4"x4" Aluminium</p> <p><b>DRILLING METHODS</b> Soil Drill: Rotasonic (6 inch casing by 4 inch core barrel) Rock Drill: Rotasonic Sample Type: Rotasonic</p>		
45	790								4	7.80 10.00
50	785									
55	780								5	6.20 10.00
60	775									
65	770								6	8.50 10.00
70	765	Boring completed at 70.00 ft			764					
75	760									
80	755									

BOREHOLE RECORD 166849621.GPJ PIEDMONT.GDT 5/24/21

LOG SCALE: 1 in = 5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Tommy Ardito

INSPECTOR: Michael Boatman, PG  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/24/21





# RECORD OF BOREHOLE DGWC-121

SHEET 1 of 2

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 50.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/22/22  
DATE COMPLETED: 3/22/22

NORTHING: 1,390,739.7  
EASTING: 2,200,849.4  
GS ELEVATION: 764.52  
TOC ELEVATION: 764.16 ft

DEPTH W.L.: 9.4'  
ELEVATION W.L.: 755.12  
DATE W.L.: 3/22/22  
TIME W.L.: 19:25

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 8.00 Fill material							Aquaguard Grout	<b>WELL CASING</b> Interval: 0'-39.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 39.7'-49.7' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 37.5'-49.7' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 3.5 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 34'-37.5' Type: Pel Plug Bentonite Pellets Quantity: 1 x 50 lb bucket  <b>ANNULUS SEAL</b> Interval: 0'-34' Type: Aquaguard bentonite grout Quantity: 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
5	760				756.5	1		6.50		
		8.00 - 10.00 MH, CLAYEY SILT; very micaceous, little fine to coarse sand, brown/red brown, saprolitic, dry	MH		8.00			10.00		
10	755				754.5					
		10.00 - 20.00 ML, fine sandy SILT; very micaceous, little clay, brown to dark brown, saprolitic, crenulated, dry	ML		10.00	2		9.75		
15	750							10.00		
		20.00 - 29.50 SW-ML, fine SAND and SILT; very micaceous, little clay, dark brown to brown, iron staining, saprolitic, moist	SW-ML		744.5	3		9.75		
20	745				20.00			10.00		
25	740									
		29.50 - 30.00 TWR, Transitionally Weathered Rock; muscovite schist	TWR		734.0	4		9.75		
30	735				30.00			10.00		
		30.00 - 40.00 TWR; fine to coarse gravel with fine sandy silt, little clay, friable, very micaceous, brown to dark brown, orange iron staining in soils, moist	TWR			5		7.50		
35	730							10.00		
		40.00 - 48.50 TWR; same as above	TWR		724.5					
40	725				40.00					
		48.50 - 50.00 muscovite SCHIST, fine to coarse grained, medium strong,			716.0					
45	720				48.50					
50	715				714.5					

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

wsp GOLDER

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ, PIEDMONT.GDT, 5/13/22



# RECORD OF BOREHOLE DGWC-121

SHEET 2 of 2

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 50.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/22/22  
DATE COMPLETED: 3/22/22

NORTHING: 1,390,739.7  
EASTING: 2,200,849.4  
GS ELEVATION: 764.52  
TOC ELEVATION: 764.16 ft

DEPTH W.L.:9.4'  
ELEVATION  
W.L.:755.12  
DATE W.L.:3/22/22  
TIME W.L.:19:25

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
50		slightly to moderately weathered, slightly to moderately fractured, some iron staining Boring completed at 50.00 ft								<b>WELL CASING</b> Interval: 0'-39.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 39.7'-49.7' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 37.5'-49.7' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 3.5 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 34'-37.5' Type: Pel Plug Bentonite Pellets Quantity: 1 x 50 lb bucket  <b>ANNULUS SEAL</b> Interval: 0'-34' Type: Aquaguard bentonite grout Quantity: 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
55	710									
60	705									
65	700									
70	695									
75	690									
80	685									
85	680									
90	675									
95	670									
100	665									

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22



BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ PIEDMONT.GDT 5/13/22



# RECORD OF BOREHOLE B-122D

SHEET 1 of 2

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 85.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/24/22  
DATE COMPLETED: 3/24/22

NORTHING: 1,390,992.8  
EASTING: 2,202,975.4  
GS ELEVATION: 777.32  
TOC ELEVATION: 777.03 ft

DEPTH W.L.: 30.25  
ELEVATION W.L.: 747.07  
DATE W.L.: 3/25/22  
TIME W.L.: 8:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 10.00 FILL, CL, SILTY CLAY, moist, micaceous, trace of organics; air knifed for utility clearance							Aquaguard - Grout	<b>WELL CASING</b> Interval: 0'-69.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 69.8'-79.8' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 67.8'-85' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 5 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 64.2'-67.8' Type: Pel Plug Bentonite Pellets Quantity: 1 x 50 lb bucket  <b>ANNULUS SEAL</b> Interval: 0'-64.2' Type: Aquaguard bentonite grout Quantity: 3 batches of 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
775						1		NA		
5								10.00		
770										
10		10.00 - 20.00 CL, SILTY CLAY, moist, high plasticity, little fine to coarse gravel, orange to brown, schist fragments	CH		767.3	2		8.50		
765					10.00			10.00		
15										
760										
20		20.00 - 30.00 SP-SM, SAND and SILT, dark brown, iron staining, low plasticity, weathered boulder encountered, muscovite, biotite schist boulder			757.3	3		6.50		
755					20.00			10.00		
25			SP-SM							
750										
30		30.00 - 40.00 SP-SM, SAND, moist, dark gray, fine grained, trace of organics, rounded shape			747.3	4		9.75		
745					30.00			10.00		
35			SP-SM							
740										
40		40.00 - 41.00 SP-SM, SILTY SAND, dark brown, little iron staining, fine, rounded shape	SP-SM		737.3	5		9.75		
735		41.00 - 50.00 muscovite biotite SCHIST, strong, fresh to slightly weathered, slightly fractured, fine to coarse grains, little iron staining			736.3			10.00		
45										
730										
50					727.3					

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

wsp GOLDER

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ, PIEDMONT.GDT, 5/13/22



# RECORD OF BOREHOLE B-122D

SHEET 2 of 2

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 85.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/24/22  
DATE COMPLETED: 3/24/22

NORTHING: 1,390,992.8  
EASTING: 2,202,975.4  
GS ELEVATION: 777.32  
TOC ELEVATION: 777.03 ft

DEPTH W.L.: 30.25  
ELEVATION W.L.: 747.07  
DATE W.L.: 3/25/22  
TIME W.L.: 8:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
50		50.00 - 60.00 Muscovite biotite SCHIST, strong, fresh, unfractured, fine to coarse grains			50.00					<p><b>WELL CASING</b> Interval: 0'-69.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p><b>WELL SCREEN</b> Interval: 69.8'-79.8' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"</p> <p><b>FILTER PACK</b> Interval: 67.8'-85' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 5 x 50 lb bag</p> <p><b>FILTER PACK SEAL</b> Interval: 64.2'-67.8' Type: Pel Plug Bentonite Pellets Quantity: 1 x 50 lb bucket</p> <p><b>ANNULUS SEAL</b> Interval: 0'-64.2' Type: Aquaguard bentonite grout Quantity: 3 batches of 2 bags Aquaguard + 40 gal water</p> <p><b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum</p> <p><b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic</p>
725						6		6.50 10.00		
55										
720										
60		60.00 - 65.00 Same as above			717.3 60.00					
715										
65		65.00 - 70.00 muscovite biotite SCHIST, strong, fresh to slightly weathered, slightly fractured, fine to coarse grained, traces of iron staining			712.3 65.00	7		9.50 10.00		
710										
70		70.00 - 73.00 Same as above, some iron staining, slightly to moderately fractured			707.3 70.00					
705										
75		73.00 - 80.00 muscovite biotite SCHIST, strong fresh, unfractured, fine to coarse grained			704.3 73.00	8		9.20 10.00		
700										
80		80.00 - 85.00 muscovite biotite SCHIST, strong fresh to slightly weathered, slightly fractured, fine to coarse grained, trace to little iron staining			697.3 80.00	9		5.00 5.00		<p>Pel Plug Bentonite Pellets</p> <p>Filter Sil Filtration sand and gravel 0.010" Slotted Schedule 40 PVC U-pack Screen</p>
695										
85		Boring completed at 85.00 ft			692.3					
690										
90										
685										
95										
680										
100										

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ PIEDMONT.GDT 5/13/22

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

**wsp** GOLDER



# RECORD OF BOREHOLE B-123D

SHEET 1 of 4

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 160.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/25/22  
DATE COMPLETED: 4/4/22

NORTHING: 1,391,234.4  
EASTING: 2,202,608.4  
GS ELEVATION: 778.85  
TOC ELEVATION: 781.80 ft

DEPTH W.L.:13.2  
ELEVATION W.L.:765.65  
DATE W.L.:4/4/22  
TIME W.L.:14:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
0		0.00 - 10.00 FILL, CL, SILTY CLAY, moist, micaceous, trace of organics; Air knifed for utility clearance	CL							<b>WELL CASING</b> Interval: 0'-110' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 110'-160' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 107.3'-160' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 16 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 62.5'-107.3' Type: Pel Plug Bentonite Pellets / Haliburton Bentonite Chips 3/8" Quantity: 3 x 50 lb bucket, 10 bags chips  <b>ANNULUS SEAL</b> Interval: 0'-55.5' Type: Aquaguard bentonite grout Quantity: 2.5 batches of 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
775						1		NA		
5								10.00		
770					768.9					
10		10.00 - 20.00 ML-CH, SILT and CLAY, moist, red, orange, brown, some fine sand, trace of fine schist gravel, micaceous	ML-CH		10.00					
765						2		9.75		
15								10.00		
760					758.9					
20		20.00 - 28.00 Same as above	ML-CH		20.00					
755						3		8.50		
25								10.00		
750					750.9					
30		28.00 - 30.00 ML, sandy SILT, moist, gray, fine, trace of coarse gravel	ML		28.00					
745						4		9.75		
35								10.00		
740					738.9					
40		30.00 - 31.50 Same as above	ML		30.00					
735						5		7.50		
45								10.00		
730		31.50 - 40.00 muscovite biotite SCHIST, fine grained, strong, slightly to moderately weathered, slight, fractured, some iron staining			31.50					
50										
		40.00 - 50.00 muscovite biotite garnet SCHIST, fine to coarse grained, strong, fresh to slightly weathered, slightly fractured, traces iron staining			40.00					
					728.9					
		Log continued on next page								

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ, PIEDMONT.GDT 5/13/22

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

**wsp** GOLDER



# RECORD OF BOREHOLE B-123D

SHEET 2 of 4

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 160.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/25/22  
DATE COMPLETED: 4/4/22

NORTHING: 1,391,234.4  
EASTING: 2,202,608.4  
GS ELEVATION: 778.85  
TOC ELEVATION: 781.80 ft

DEPTH W.L.:13.2  
ELEVATION W.L.:765.65  
DATE W.L.:4/4/22  
TIME W.L.:14:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
50		50.00 - 60.00 muscovite biotite SCHIST, fine to coarse grained, strong, fresh to slightly weathered, slightly fractured, traces of iron staining			50.00				Pel Plug - Pellets	<b>WELL CASING</b> Interval: 0'-110' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 110'-160' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 107.3'-160' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 16 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 62.5'-107.3' Type: Pel Plug Bentonite Pellets / Haliburton Bentonite Chips 3/8" Quantity: 3 x 50 lb bucket, 10 bags chips  <b>ANNULUS SEAL</b> Interval: 0'-55.5' Type: Aquaguard bentonite grout Quantity: 2.5 batches of 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
725						6		9.30 10.00		
55										
720										
60		60.00 - 70.00 muscovite biotite chlorite SCHIST, fine to coarse grained, strong, fresh, unfractured to slightly fractured, trace of iron staining			718.9 60.00				Haliburton Bentonite - Chips 3/8"	
715						7		9.50 10.00		
65										
710										
70		70.00 - 80.00 muscovite biotite SCHIST, fine to coarse grained, strong, fresh, unfractured to slightly weathered, slightly fractured, secondary mineralization of fractures, trace of iron staining			708.9 70.00					
705						8		9.50 10.00		
75										
700										
80		80.00 - 90.00 muscovite biotite SCHIST, fine to coarse grained, strong, fresh, unfractured to slightly weathered, slightly fractured, secondary mineralization of fractures, trace of iron staining			698.9 80.00					
695						9		7.50 10.00		
85										
690										
90		90.00 - 100.00 muscovite biotite SCHIST, fine to coarse grained, strong, fresh, fresh to slightly weathered, unfractured to slightly fractured			688.9 90.00					
685						10		8.00 10.00		
95										
680										
100		Log continued on next page			678.9					

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D.GPJ PIEDMONT.GDT 5/13/22

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

wsp GOLDER



# RECORD OF BOREHOLE B-123D

SHEET 3 of 4

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 160.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/25/22  
DATE COMPLETED: 4/4/22

NORTHING: 1,391,234.4  
EASTING: 2,202,608.4  
GS ELEVATION: 778.85  
TOC ELEVATION: 781.80 ft

DEPTH W.L.: 13.2  
ELEVATION W.L.: 765.65  
DATE W.L.: 4/4/22  
TIME W.L.: 14:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
100		100.00 - 110.00 muscovite biotite SCHIST, fine to coarse grained, strong, fresh, fresh to slightly weathered, unfractured to slightly fractured			100.00					<b>WELL CASING</b> Interval: 0'-110' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 110'-160' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 107.3'-160' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 16 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 62.5'-107.3' Type: Pel Plug Bentonite Pellets / Haliburton Bentonite Chips 3/8" Quantity: 3 x 50 lb bucket, 10 bags chips  <b>ANNULUS SEAL</b> Interval: 0'-55.5' Type: Aquaguard bentonite grout Quantity: 2.5 batches of 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
675						11		9.75 10.00		
105										
670										
110		110.00 - 120.00 muscovite Biotite SCHIST, fine to coarse grained, strong, fresh to slightly weathered, slightly fractured, secondary mineralization of fractures with calcite @ 114' bgs, measured -0.018 gallons per minute (gpm) from borehole geophysics heat-pulse flow meter (HPFM), trace vein quartz			668.9 110.00					
665						12		8.25 10.00		
115										
660										
120		120.00 - 130.00 Same as above. Water producing fracture at 129.5' identified using borehole geophysics			658.9 120.00					
655						13		9.75 10.00		
125										
650										
130		130.00 - 140.00 Same as above; Trace secondary mineralization of calcite within fractures @ 131 bgs, water producing fracture at 130.5' identified using borehole geophysics, measured -0.027 gallons per minute (gpm) from HPFM			648.9 130.00					
645						14		9.00 10.00		
135										
640										
140		140.00 - 150.00 muscovite biotite, garnet SCHIST, fine to coarse grained, strong, fresh to slightly weathered, slightly fractured, calcite precipitation @ 145' bgs			638.9 140.00					
635						15		9.00 10.00		
145										
630										
150		Log continued on next page			628.9					

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22

wsp GOLDER

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D, GPJ, PIEDMONT, GDT, 5/13/22



# RECORD OF BOREHOLE B-123D



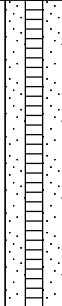
SHEET 4 of 4

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849621  
DRILLED DEPTH: 160.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Terra Sonic 150T  
Truck-Mounted Sonic  
DATE STARTED: 3/25/22  
DATE COMPLETED: 4/4/22

NORTHING: 1,391,234.4  
EASTING: 2,202,608.4  
GS ELEVATION: 778.85  
TOC ELEVATION: 781.80 ft

DEPTH W.L.:13.2  
ELEVATION W.L.:765.65  
DATE W.L.:4/4/22  
TIME W.L.:14:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
150		150.00 - 160.00 Same as above; calcite @ 157.5' bgs			150.00					<b>WELL CASING</b> Interval: 0'-110' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 110'-160' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 107.3'-160' Type: Filter Sil - Filtration sand and gravel, industrial quartz Quantity: 16 x 50 lb bag  <b>FILTER PACK SEAL</b> Interval: 62.5'-107.3' Type: Pel Plug Bentonite Pellets / Haliburton Bentonite Chips 3/8" Quantity: 3 x 50 lb bucket, 10 bags chips  <b>ANNULUS SEAL</b> Interval: 0'-55.5' Type: Aquaguard bentonite grout Quantity: 2.5 batches of 2 bags Aquaguard + 40 gal water  <b>WELL COMPLETION</b> Pad: 4' x 4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
625						16		9.75 10.00		
155										
620										
160		Boring completed at 160.00 ft			618.9					
615										
165										
610										
170										
605										
175										
600										
180										
595										
185										
590										
190										
585										
195										
580										
200										

BOREHOLE RECORD PLANT MCDONOUGH\_DGWC-121, B-122D, B-123D, GPJ, PIEDMONT, GDT, 5/13/22

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Corey Franklin

GA INSPECTOR: Connor Mikilitus  
CHECKED BY: Rachel Kirkman, PG  
DATE: 5/10/22





# RECORD OF BOREHOLE B-125D

SHEET 1 of 5

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849622  
DRILLED DEPTH: 220.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Track Rig PS150  
DATE STARTED: 3/14/23  
DATE COMPLETED: 3/31/23

NORTHING: 1,394,111.60  
EASTING: 2,202,580.70  
GS ELEVATION: 819.15 ft  
TOC ELEVATION: 821.70 ft

DEPTH W.L.: 15.7 ft  
ELEVATION W.L.:  
DATE W.L.: 3/31/23  
TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES		WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC			
					DEPTH (ft)						
0		0.00 - 10.00 FILL, SC, CLAYEY SAND, some silt, red, trace mica, highly weathered, NC, moist, trending drier downhole, loose to compact; air knifed for utility clearance	SC			1		4.00 10.00	Aquaguard Grout		<b>WELL CASING</b> Interval: 0'-135.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded
815											
5											<b>FILTER PACK</b> Interval: 132.6'-146.5' Type: No. 2 Filter Sand Quantity: 4x15-cu ft bag
810											<b>FILTER PACK SEAL</b> Interval: 128'-132.6' Type: Pel Plug Bentonite Pellets 3/8" Quantity: 1 x 5 gal bucket
10		10.00 - 20.00 RESIDUUM, SP, fine SAND with trace clay, tan, trace mica, moderately weathered, NC, moist, loose	SP		809.15 10.00	2		4.00 10.00			<b>ANNULUS SEAL</b> Interval: 132.6'-146.5' Type: Aquaguard bentonite grout Quantity: 8 bags
805											
800											<b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
20		20.00 - 22.50 SW, fine to coarse SAND with gravels of schist, saprolitic schist structure observed, tan, highly weathered, NC, dry, very loose	SW		799.15 20.00	3		9.50 10.00			
795		22.50 - 25.00 TWR, GP, angular GRAVEL with fine to coarse sand; schistic gravels, highly weathered, NC, dry, very loose	GP		796.65 22.50						
25		25.00 - 30.00 BEDROCK, highly weathered GNEISS, very rough surface, multiple fractures			794.15 25.00						
790											
30		30.00 - 34.00 No Recovery			789.15 30.00	4		6.00 10.00			
785		34.00 - 68.00 moderately weathered GNEISS, very rough surface, multiple fractures									
35					785.15 34.00						
780											
40						5		9.50 10.00			
775											
45											
770											
50											

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Brendan Griffin

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Rhonda Quinn  
DATE: 5/11/2023





# RECORD OF BOREHOLE B-125D

SHEET 2 of 5

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849622  
DRILLED DEPTH: 220.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Track Rig PS150  
DATE STARTED: 3/14/23  
DATE COMPLETED: 3/31/23

NORTHING: 1,394,111.60  
EASTING: 2,202,580.70  
GS ELEVATION: 819.15 ft  
TOC ELEVATION: 821.70 ft

DEPTH W.L.: 15.7 ft  
ELEVATION W.L.:  
DATE W.L.: 3/31/23  
TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO	REC				
					DEPTH (ft)							
50		34.00 - 68.00 moderately weathered GNEISS, very rough surface, multiple fractures <i>(Continued)</i>									<b>WELL CASING</b> Interval: 0'-135.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded	
	765					6		8.00 10.00			<b>WELL SCREEN</b> Interval: 135.1'-145.1' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"	
55											<b>FILTER PACK</b> Interval: 132.6'-146.5' Type: No. 2 Filter Sand Quantity: 4x15-cu ft bag	
	760										<b>FILTER PACK SEAL</b> Interval: 128'-132.6' Type: Pel Plug Bentonite Pellets 3/8" Quantity: 1 x 5 gal bucket	
60											<b>ANNULUS SEAL</b> Interval: 0'-128' Type: Aquaguard bentonite grout Quantity: 8 bags	
	755					7		6.00 10.00			<b>WELL COMPLETION</b> Pad: 4'x4' Protective Casing: Aluminum	
65											<b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic	
	750	68.00 - 70.00 highly weathered GNEISS, very rough surface, multiple fractures, iron staining			751.15 68.00							
70		70.00 - 150.00 moderately to slightly weathered GNEISS; rough irregular surface, multiple fractures, intermittent quartz lenses, iron staining at 77.5', 130'-140'			749.15 70.00							
	745					8		5.00 10.00				
75												
	740											
80												
	735					9		7.00 10.00				
85												
	730											
90												
	725					10		5.00 10.00				
95												
	720											
100		Log continued on next page										

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Brendan Griffin

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Rhonda Quinn  
DATE: 5/11/2023





# RECORD OF BOREHOLE B-125D

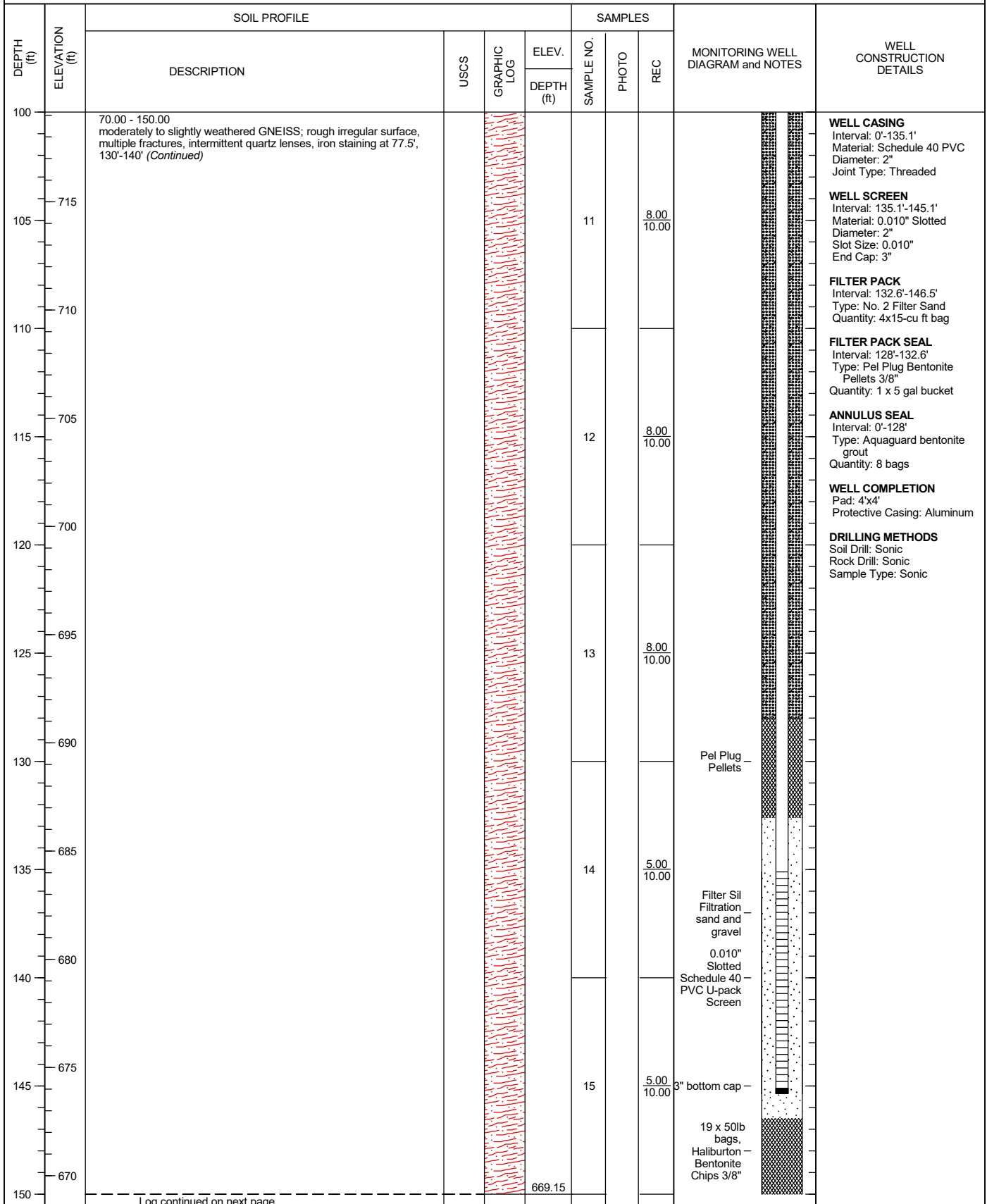
SHEET 3 of 5

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849622  
DRILLED DEPTH: 220.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Track Rig PS150  
DATE STARTED: 3/14/23  
DATE COMPLETED: 3/31/23

NORTHING: 1,394,111.60  
EASTING: 2,202,580.70  
GS ELEVATION: 819.15 ft  
TOC ELEVATION: 821.70 ft

DEPTH W.L.: 15.7 ft  
ELEVATION W.L.:  
DATE W.L.: 3/31/23  
TIME W.L.:



LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Brendan Griffin

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Rhonda Quinn  
DATE: 5/11/2023





# RECORD OF BOREHOLE B-125D

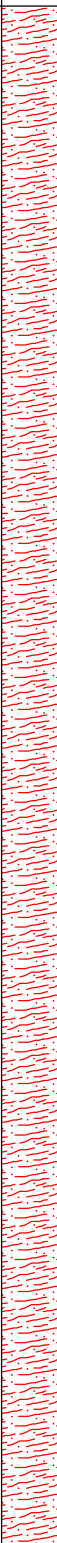




SHEET 4 of 5

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849622  
DRILLED DEPTH: 220.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Track Rig PS150  
DATE STARTED: 3/14/23  
DATE COMPLETED: 3/31/23

NORTHING: 1,394,111.60  
EASTING: 2,202,580.70  
GS ELEVATION: 819.15 ft  
TOC ELEVATION: 821.70 ft

DEPTH W.L.: 15.7 ft  
ELEVATION W.L.:  
DATE W.L.: 3/31/23  
TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	PHOTO	REC		
150		150.00 - 220.00 moderately to highly weathered GNEISS; rough irregular surface, multiple fractures, quartz and biotite mica, iron staining at 157'-160'			150.00					<b>WELL CASING</b> Interval: 0'-135.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded  <b>WELL SCREEN</b> Interval: 135.1'-145.1' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"  <b>FILTER PACK</b> Interval: 132.6'-146.5' Type: No. 2 Filter Sand Quantity: 4x15-cu ft bag  <b>FILTER PACK SEAL</b> Interval: 128'-132.6' Type: Pel Plug Bentonite Pellets 3/8" Quantity: 1 x 5 gal bucket  <b>ANNULUS SEAL</b> Interval: 0'-128' Type: Aquaguard bentonite grout Quantity: 8 bags  <b>WELL COMPLETION</b> Pad: 4'x4' Protective Casing: Aluminum  <b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
665						16		10.00 10.00		
155										
660										
160										
655						17		7.50 10.00		
165										
650										
170										
645						18		10.00 10.00		
175										
640										
180										
635						19		8.00 10.00		
185										
630										
190										
625						20		10.00 10.00		
195										
620										
200										

Log continued on next page

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Brendan Griffin

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Rhonda Quinn  
DATE: 5/11/2023





# RECORD OF BOREHOLE B-125D

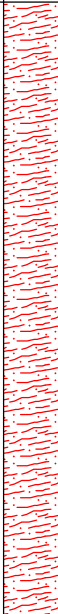

SHEET 5 of 5

PROJECT: SCS Plant McDonough  
PROJECT NUMBER: GL166849622  
DRILLED DEPTH: 220.00 ft  
LOCATION: Smyrna, GA

DRILL RIG: Track Rig PS150  
DATE STARTED: 3/14/23  
DATE COMPLETED: 3/31/23

NORTHING: 1,394,111.60  
EASTING: 2,202,580.70  
GS ELEVATION: 819.15 ft  
TOC ELEVATION: 821.70 ft

DEPTH W.L.: 15.7 ft  
ELEVATION W.L.:  
DATE W.L.: 3/31/23  
TIME W.L.:

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES			MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	PHOTO			REC
					DEPTH (ft)					
200		150.00 - 220.00 moderately to highly weathered GNEISS; rough irregular surface, muple fractures, quartz and biotite mica, iron staining at 157'-160' (Continued)								
	615					21		10.00 10.00		<b>WELL CASING</b> Interval: 0'-135.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded
205										<b>WELL SCREEN</b> Interval: 135.1'-145.1' Material: 0.010" Slotted Diameter: 2" Slot Size: 0.010" End Cap: 3"
	610									<b>FILTER PACK</b> Interval: 132.6'-146.5' Type: No. 2 Filter Sand Quantity: 4x15-cu ft bag
210										<b>FILTER PACK SEAL</b> Interval: 128'-132.6' Type: Pel Plug Bentonite Pellets 3/8" Quantity: 1 x 5 gal bucket
	605									<b>ANNULUS SEAL</b> Interval: 0'-128' Type: Aquaguard bentonite grout Quantity: 8 bags
215						22		7.00 10.00		<b>WELL COMPLETION</b> Pad: 4'x4' Protective Casing: Aluminum
600										<b>DRILLING METHODS</b> Soil Drill: Sonic Rock Drill: Sonic Sample Type: Sonic
220		Boring completed at 220.00 ft			599.15					
	595									
225										
	590									
230										
	585									
235										
	580									
240										
	575									
245										
	570									
250										

LOG SCALE: 1 in = 6.5 ft  
DRILLING COMPANY: Cascade Drilling  
DRILLER: Brendan Griffin

GA INSPECTOR: Chris Tidwell  
CHECKED BY: Rhonda Quinn  
DATE: 5/11/2023





# RECORD OF BOREHOLE B-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 6, 2020 09:30  
DRILLING END: August 6, 2020 11:15  
COORDINATES: N: 1,391,891 E: 2,201,581

SHEET: 1 of 2  
GS ELEV.: 792  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING	
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic				REC ATT (in)
0		0.0		792.0						20 40 60 80 W <sub>p</sub> — W — W <sub>i</sub> 20 40 60 80		
			Hydrovac.									
5												
10		10.0	No recovery	782.0			TP ST-01		0 24			
		12.0	(ML), CLAYEY SILT AND SAND, low to medium plasticity, and sand, trace gravel, grayish-brown; soft to firm, w ~ PL	780.0	ML		TP ST-02		0 24			
15		17.0	RESIDUUM, (SM), SILTY SAND, fine to coarse, and low plasticity fines, some fine gravel, brown to blue-gray; non-cohesive, loose, wet, saprolitic	775.0	SM		DO S-01	WH-3-2-4 (5)	10 24	5 ■		
20							DO S-02	3-4-4-7 (8)	24 24	8 ■		
		23.0	RESIDUUM, (ML), CLAYEY SILT AND SAND, low plasticity, and fine to coarse sand, trace fine gravel, red-brown; cohesive, compact to dense, w < PL, saprolitic	769.0	ML		DO S-03	4-12-16-20 (28)	24 24	28 ■		
25												
30												

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 6, 2020 09:30  
DRILLING END: August 6, 2020 11:15  
COORDINATES: N: 1,391,891 E: 2,201,581

SHEET: 2 of 2  
GS ELEV.: 792  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:58  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DAV\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109\_AP1 MCDONOUGH\_LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
30		30.0		762.0						
			RESIDUUM, (ML), CLAYEY SILT AND SAND, low plasticity, and fine to coarse sand, trace fine gravel, red-brown; cohesive, compact to dense, w < PL, saprolitic (continued)				DO S-04	4-10-19-19 (29)	18 24	
35					ML		DO S-05	8-17-23-30 (40)	22 24	
40		39.8 40.0	PARTIALLY WEATHERED ROCK, SAMPLED AS, (GP), SANDY GRAVEL, poorly graded, dark gray; very dense, moist Refusal at 40.0 ft. Bottom of borehole at 40.0 ft. Backfilled with soil cuttings	752.2 752.0	GP		DO S-06	50/2" (50/2")	2 2	100
45										
50										
55										
60										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-02

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 6, 2020 07:20  
DRILLING END: August 6, 2020 08:45  
COORDINATES: N: 1,391,691 E: 2,201,585

SHEET: 1 of 2  
GS ELEV.: 791  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		791.0						
5			Hydrovac.							
10		10.0		781.0						
15			(ML), SANDY CLAYEY SILT, non plastic, fine to coarse sand, trace fine gravel; non-cohesive, loose to compact, w < PL, weathered schist		ML		DO S-01	3-3-4-6 (7)	24 24	
20							DO S-02	2-2-4-10 (6)	24 24	
25		25.0		766.0			DO TP S-03	6-8-11-16 (19)	12 24 19 24	
30			RESIDUUM, (SM), SILTY SAND, fine, low to non plastic plasticity fines, dark gray to black; dense to very dense, dry to moist, relict structure		SM		DO S-04	5-18-24-26 (42)	18 24	
35		33.0		758.0			DO S-05	31-28-51-37 (79)	18 24	
40			PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), SANDY CLAYEY SILT, low to medium plasticity, fine to medium sand, red-brown to gray; cohesive, very dense, w < PL, saprolitic, contains fine grained gneiss		ML		DO S-06	12-30-50/5" (80/11")	16 17	
Log continued on next page										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:58  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-02

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: August 6, 2020 07:20  
 DRILLING END: August 6, 2020 08:45  
 COORDINATES: N: 1,391,691 E: 2,201,585

SHEET: 2 of 2  
 GS ELEV.: 791  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			<div> <div>■ PENETRATION RESISTANCE BLOWS / ft</div> <div> <div>20 40 60 80</div> <div>W<sub>e</sub>  -----  W<sub>i</sub></div> </div> </div>	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic			
								REC ATT (in)			
40		40.0		751.0							
			PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), SANDY CLAYEY SILT, low to medium plasticity, fine to medium sand, red-brown to gray; cohesive, very dense, w < PL, saprolitic, contains fine grained gneiss ( <i>continued</i> )		ML		DO S-07	18-50/5" (50/5")	11 11		
45											
		46.0		745.0			DO S-08	14-50 (50/1")	12 12		
			Refusal at 46.0 ft. Bottom of borehole at 46.0 ft. Backfilled with soil cuttings								
50											
55											
60											
65											
70											
75											
80											

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Michael Boatman  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 8/20/21 09:58  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DAV\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-03

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 27, 2020 08:00  
DRILLING END: July 27, 2020 13:00  
COORDINATES: N: 1,391,423 E: 2,201,768

SHEET: 1 of 2  
GS ELEV.: 801  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		801.0						
5			RESIDUUM, (ML), SANDY CLAYEY SILT, non plastic, fine to coarse sand, trace fine gravel, tan to brown; micaceous, non-cohesive, loose to dense, dry to wet							
10										
15										
20										
25										
30										
35										
40										

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Qian Zhao  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-03

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 27, 2020 08:00  
DRILLING END: July 27, 2020 13:00  
COORDINATES: N: 1,391,423 E: 2,201,768

SHEET: 2 of 2  
GS ELEV.: 801  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		761.0						
45			RESIDUUM, (ML), SANDY CLAYEY SILT, non plastic, fine to coarse sand, trace fine gravel, tan to brown; micaceous, non-cohesive, loose to dense, dry to wet (continued)				DO S-09	4-6-10 (16)	18 18	16
50							DO S-10	5-11-18 (29)	18 18	29
55			Rock fragments in the sample as gravel		ML		DO S-11	5-12-14 (26)	18 18	26
60							DO S-12	5-7-14 (21)	18 18	21
65							DO S-13	4-10-16 (26)	18 18	26
70							DO S-14	7-12-18 (30)	18 18	30
75		73.0	PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), GRAVELLY SILTY SAND, fine, non plastic fines, tan to brown; micaceous, non-cohesive, compact to dense, dry to wet	728.0	SM		DO S-15	50-50/3" (50/3")	9 9	100
80		77.0	Refusal at 77.0 ft. Bottom of borehole at 77.0 ft. Backfilled with soil cuttings	724.0						

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Qian Zhao  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-04

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: July 27, 2020 14:00  
 DRILLING END: July 28, 2020 11:30  
 COORDINATES: N: 1,391,192 E: 2,201,761

SHEET: 1 of 2  
 GS ELEV.: 797  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			<div> <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> <div> <div>W<sub>p</sub></div> <div>W</div> <div>W<sub>i</sub></div> </div> </div>	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER  BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic  REC ATT (in)			
0		0.0		797.0						
			RESIDUUM, (ML), SANDY CLAYEY SILT, non plastic, fine to coarse sand, trace fine gravel, brown to red-brown; micaceous, non-cohesive, very loose to dense, dry to wet							
5							DO S-01 1-0-0 (0) 2 18			
10							DO S-02 4-4-6 (10) 18 18	10		
15							DO S-03 3-3-5 (8) 18 18	8		
20							DO S-04 4-7-9 (16) 18 18	16		
25							DO S-05 4-8-9 (17) 18 18	17		
30							DO S-06 5-7-9 (16) 18 18	16		
35							DO S-07 5-5-10 (15) 18 18	15		
40							DO S-08 6-11-15 (26) 18 18	26		

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:58  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\FILES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-04

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 27, 2020 14:00  
DRILLING END: July 28, 2020 11:30  
COORDINATES: N: 1,391,192 E: 2,201,761

SHEET: 2 of 2  
GS ELEV.: 797  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:58  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		757.0						
			RESIDUUM, (ML), SANDY CLAYEY SILT, non plastic, fine to coarse sand, trace fine gravel, brown to red-brown; micaceous, non-cohesive, very loose to dense, dry to wet (continued)							
45							DO S-09	4-8-14 (22)	18 18	
50							DO S-10	4-9-19 (28)	18 18	
55							DO S-11	6-9-20 (29)	18 18	
60							DO S-12	6-15-27 (42)	18 18	
62.0				735.0						
63.5			RESIDUUM, (SM), SILTY SAND, fine to medium, non plastic fines, brown with gray; micaceous, non-cohesive, very dense, wet	733.5	SM		DO S-13	16-47-50/5" (97/11")	18 17	
65			PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), GRAVELLY SANDY SILT, non plastic, fine to medium sand, brown; non-cohesive, wet							
70							DO S-14	50/4" (50/4")	4 4	
72.0				725.0						
75			Refusal at 72.0 ft. Bottom of borehole at 72.0 ft. Backfilled with soil cuttings							
80										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-05

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 28, 2020 15:55  
DRILLING END: July 28, 2020 18:15  
COORDINATES: N: 1,390,752 E: 2,201,733

SHEET: 1 of 2  
GS ELEV.: 782  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		782.0							
5			RESIDUUM, (ML), SANDY CLAYEY SILT, low plasticity, fine to coarse sand, trace fine gravel, brown; non-cohesive, loose to compact, dry, tree roots								
10											
15					ML		DO S-01	6-6-7-11 (13)	19 24	13	Hand auger utility clearance 0 to 10 feet.
20							DO S-02	4-6-7-11 (13)	22 24	13	Tree roots
25							DO S-03	4-4-5-7 (9)	22 24	9	▼ 18.0 ft, 07/29/2020 07:43
30		28.0	RESIDUUM, (SM), SILTY SAND, fine, brown; micaceous, non-cohesive, compact to dense, wet	754.0	SM		TP ST-01		24 24	21	▼ 20.0 ft, 07/28/2020 18:15
35							DO S-05	9-10-15-20 (25)	24 24	25	Shelby Tube pushed at 28'
40							DO S-06	5-14-18-18 (32)	21 24	32	
Log continued on next page											

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree










# RECORD OF BOREHOLE B-05

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 28, 2020 15:55  
DRILLING END: July 28, 2020 18:15  
COORDINATES: N: 1,390,752 E: 2,201,733

SHEET: 2 of 2  
GS ELEV.: 782  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft		NOTES WATER LEVELS	ADDITIONAL LAB TESTING	
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	WATER CONTENT (%)			
										W <sub>p</sub>			W <sub>i</sub>
40		40.0		742.0									
			RESIDUUM, (SM), SILTY SAND, fine, brown; micaceous, non-cohesive, compact to dense, wet <i>(continued)</i>		SM		DO S-07	5-6-11-14 (17)	19 24	17			
45													
							DO S-08	4-9-15-20 (24)	24 24	24			
		48.0		734.0									
			RESIDUUM, (SM), SILTY SAND, fine to coarse, and , trace fine gravel; micaceous, non-cohesive, dense, wet		SM		DO S-09	5-12-19-25 (31)	22 24	31			
50													
							DO S-10	5-8-15-21 (23)	24 24	23			
55													
							DO S-11	9-14-20-38 (34)	24 24	34			
60		62.0		720.0									
			Refusal at 62.0 ft. Bottom of borehole at 62.0 ft. Backfilled with soil cuttings										
65													
70													
75													
80													

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-06

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 30, 2020 08:10  
DRILLING END: July 30, 2020 11:15  
COORDINATES: N: 1,390,489 E: 2,201,596

SHEET: 1 of 2  
GS ELEV.: 790  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		790.0						
5			FILL, (ML), SANDY CLAYEY SILT, fine to coarse sand, trace fine to coarse gravel, brown; micaceous, non-cohesive, loose to compact, dry							
10							DO S-01	6-6-8-9 (14)	22 24	
15					ML		DO S-02	6-8-12-13 (20)	24 24	
20							DO S-03	6-8-9-12 (17)	24 24	
25							DO S-04	8-9-11-13 (20)	22 24	
30							DO S-05	9-11-15-12 (26)	13 24	
32.0			RESIDUUM, (CL), SILTY CLAY AND SAND, medium plasticity, and fine to coarse sand, red-brown; micaceous, cohesive, soft, w < PL	758.0	CL		TP ST-01		24	
35							DO S-06	3-4-4-5 (8)	18 24	
37.0				753.0	SC		TP ST-02		24	
40			Log continued on next page							

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-06

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: July 30, 2020 08:10  
 DRILLING END: July 30, 2020 11:15  
 COORDINATES: N: 1,390,489 E: 2,201,596

SHEET: 2 of 2  
 GS ELEV.: 790  
 TOC ELEV.: na  
 DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		750.0						
			RESIDUUM, (SC), GRAVELLY CLAYEY SAND, fine to coarse, fine gravel, brown with gray; micaceous, non-cohesive, loose, wet (continued)		SC		DO S-07	2-2-4-11 (6)	24 24	
		43.0		747.0						
45			RESIDUUM, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine gravel, brown with black; micaceous, non-cohesive, loose to compact, wet				DO S-08	2-2-5-11 (7)	24 24	
50							DO S-09	9-8-12-13 (20)	15 24	
55					SM		DO S-10	6-7-11-12 (18)	16 24	
60							DO S-11	7-10-16-18 (26)	13 24	
65		63.0		727.0			DO S-12	40-50/3" (50/3")	9 9	
			PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), GRAVELLY SILT, non plastic, some fine sand, brown with black; micaceous, non-cohesive, very dense, wet				DO S-13	23-40-50/3" (90/9")	12 15	
70					ML		DO S-14	19-50/5" (50/5")	11 11	
75										
80		77.0		713.0						
			Refusal at 77.0 ft. Bottom of borehole at 77.0 ft. Backfilled with soil cuttings							

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-07

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 14, 2020 13:40  
DRILLING END: August 14, 2020 14:40  
COORDINATES: N: 1,390,301 E: 2,201,397

SHEET: 1 of 2  
GS ELEV.: 755  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		755.0						
5			FILL, (GP), GRAVEL, fine to coarse, poorly graded, angular, some fine sand, trace non plastic fines; trace cobbles to 6"		GP					
10		10.0	RESIDUUM, (CL), SANDY SILTY CLAY, medium plasticity, fine to coarse sand, brown; cohesive, soft to very stiff, w ~ PL	745.0	CL		DO S-01	WOH-WOH-1-1 (1)	15 24	
15							DO S-02	7-7-13-16 (20)	10 24	
20		20.0	RESIDUUM, (CL-ML), CLAY AND SAND, low plasticity, and fine to coarse sand, trace fine gravel, brown; cohesive, soft, w ~ PL	735.0	CL-ML		TO ST-01		20 24	
25		22.0	RESIDUUM, (SM), GRAVELLY SILTY SAND, fine to coarse, and non plastic fines, fine to coarse gravel, black-brown; non-cohesive, loose, wet	733.0	SM		DO S-03	5-3-4-9 (7)	15 24	
30							DO S-04	1-1-4-6 (5)	12 24	
35							DO S-05	2-4-4-6 (8)	18 24	
40		38.0		717.0	ML			10-11-16-22 (27)	20 24	

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\SSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-07

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: August 14, 2020 13:40  
 DRILLING END: August 14, 2020 14:40  
 COORDINATES: N: 1,390,301 E: 2,201,397

SHEET: 2 of 2  
 GS ELEV.: 755  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		715.0						
		41.0	RESIDUUM, (ML), GRAVELLY SANDY SILT, non plastic, fine to coarse sand, fine subangular gravel, brown to black; non-cohesive, dense, wet ( <i>continued</i> ) Refusal at 39.0 ft. Bottom of borehole at 41.0 ft. Backfilled with soil cuttings	714.0	ML		DO S-06			
45										
50										
55										
60										
65										
70										
75										
80										

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Scott Sanders  
 DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DAV\WWW\FROOT\SSITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-08

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 17, 2020 10:00  
DRILLING END: August 17, 2020 12:20  
COORDINATES: N: 1,390,379 E: 2,201,114

SHEET: 1 of 1  
GS ELEV.: 758  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT	
0		0.0		758.0						
5			FILL, (ML), CLAYEY SILT AND SAND, non plastic, and fine to coarse sand, trace fine to coarse subangular gravel, brown; non-cohesive, compact, moist		ML					
10							DO S-01	6-7-12-12 (19)	22 24	
15		13.0	RESIDUUM, (SM), SILTY SAND, fine to coarse, and non plastic fines, trace fine subangular gravel, brown; non-cohesive, compact to very dense, moist	745.0			DO S-02	10-11-16-35 (27)	24 24	
20					SM		DO S-03	19-25-30-23 (55)	24 24	
25							DO S-04	6-8-12-10 (20)	22 24	
30							DO S-05	8-9-10-10 (19)	20 24	
35		34.0	RESIDUUM, (ML), SILT AND SAND, non plastic, and fine to coarse sand, trace fine subangular gravel, brown; non-cohesive, dense, moist to wet	724.0			DO S-06	11-10-25-45 (35)	22 24	
					ML		DO S-07	20-14-20-22 (34)	20 24	
40		39.0	Refusal at 37.0 ft. Bottom of borehole at 39.0 ft.	719.0						

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT\COM\SSL\DAV\WWW\FROOT\SSITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-09

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 4, 2020 07:45  
DRILLING END: August 4, 2020 10:30  
COORDINATES: N: 1,390,746 E: 2,200,851

SHEET: 1 of 2  
GS ELEV.: 764  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\SSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		764.0						
5			(ML), SANDY CLAYEY SILT, non plastic, trace organics, brown; soft, w < PL, contains quartz and a lot of muscovite		ML					
10							DO S-01	4-3-3-3 (6)	7 24	
13.0				751.0						
15			RESIDUUM, (ML), SILT WITH SLIGHT PLASTICITY AND SAND, low plasticity, and fine to coarse sand, trace gravel, gray; micaceous, loose to compact, dry to moist, contains muscovite, gneiss, and quartz, saprolite		ML		DO S-02	3-5-6-8 (11)	24 24	
20							DO S-03	5-9-15-21 (24)	20 24	
25					ML		DO S-04	6-8-8-9 (16)	12 24	
30							TP ST-01		24 24	
35							DO S-05	6-10-16-23 (26)	24 24	
38.0				726.0	SM					
40			Log continued on next page							

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-09

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 4, 2020 07:45  
DRILLING END: August 4, 2020 10:30  
COORDINATES: N: 1,390,746 E: 2,200,851

SHEET: 2 of 2  
GS ELEV.: 764  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			<div> <div>■ PENETRATION RESISTANCE BLOWS / ft</div> <div> 20 40 60 80 </div> </div>	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic			
								REC ATT (in)			
40		40.0		724.0							
			PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), SILTY SAND, fine to medium, non plastic fines, red-brown to olive-gray; dense to very dense, dry (continued)		SM		DO S-06	17-33-50/5" (83/11")	17 17		
45							DO S-07	28-50/4" (50/4")	10 10		
		47.0	PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), SILT, non plastic, trace fine sand; very dense, dry to moist, contains foliated saprolite and gneiss	717.0	ML		DO S-08	50/5" (50/5")	5 5		
50							DO S-09	50/5" (50/5")	5 5		
55											
		58.0	Refusal at 58.0 ft. Bottom of borehole at 58.0 ft. Backfilled with soil cuttings	706.0							
60											
65											
70											
75											
80											

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-10

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 4, 2020 13:00  
DRILLING END: August 4, 2020 14:30  
COORDINATES: N: 1,391,116 E: 2,200,786

SHEET: 1 of 1  
GS ELEV.: 767  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDERASSOCIATES.SHAPEPOINT.COM@SSL.DAVWWWROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		767.0						
5			(SM), SILTY SAND, fine, non plastic fines; non-cohesive, loose, dry to moist		SM					
10		10.0		757.0						
15			RESIDUUM, (ML), CLAYEY SILT AND SAND, non plastic, and fine to coarse sand, brown to black; non-cohesive, compact to dense, moist		ML		DO S-01	5-5-13-14 (18)	20 24	
20		20.0 20.5		747.0 746.5	SM		DO S-02	15-17-20-24 (37)	21 24	
25			PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), SILTY SAND, fine to coarse, light gray to dark; non-cohesive, dry, contains rock fragments Refusal at 20.5 ft. Bottom of borehole at 20.5 ft. Backfilled with soil cuttings				DO S-03	50/2" (50/2")	2 2	
30										
35										
40										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-11

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 4, 2020 15:10  
DRILLING END: August 4, 2020 16:05  
COORDINATES: N: 1,391,428 E: 2,200,706

SHEET: 1 of 1  
GS ELEV.: 768  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE		SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0	768.0						
5		5.0	763.0	SP					
10		10.0	758.0	SC					
15				ML		DO S-01	32-50/3" (50/3")	9 9	
20				ML		DO S-02	11-28-50/4" (78/10")	16 16	
23.0		23.0	745.0	SM		DO S-03	5-10-10-25 (20)	21 24	
25									
30									
35									
40									

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Michael Boatman  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\FILES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-12

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 18, 2020 09:25  
DRILLING END: August 18, 2020 12:00  
COORDINATES: N: 1,391,841 E: 2,200,768

SHEET: 1 of 1  
GS ELEV.: 770  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0	770.0							
5				ML						
10		10.0	760.0							
15		15.0	755.0	SM		DO S-02	4-5-10-32 (15)	18 24		
18.0		18.0	752.0	SW		DO S-02	11-13-25-17 (38)	9 24		
18.2		18.2	751.8	SW		DO S-03	50/2" (50/2")	2 2		
20										
25										
30										
35										
40										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-13

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 18, 2020 13:45  
DRILLING END: August 18, 2020 14:45  
COORDINATES: N: 1,391,922 E: 2,200,927

SHEET: 1 of 1  
GS ELEV.: 794  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		794.0							
5			RESIDUUM, (ML), SANDY SILT, non plastic, fine to medium sand, trace fine subangular gravel, red-brown; non-cohesive, compact, dry to moist		ML						
10		10.0	RESIDUUM, (SM), SILTY SAND, fine to coarse, brown-red; non-cohesive, compact, dry to moist	784.0	SM		DO S-02	4-4-7-10 (11)	22 24	11	
15		15.0	RESIDUUM, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine subangular gravel, gray; non-cohesive, dense, moist	779.0	SM		DO S-02	11-24-21-20 (45)	20 24	45	
20					SM		DO S-03	19-28-22-28 (50)	24 24	50	
25		25.0	PARTIALLY WEATHERED ROCK, SAMPLED AS: Fractured rock	769.0			DO S-04	25-50/3" (50/3")	9 9	100	
		25.8	Refusal at 25.8 ft. Bottom of borehole at 25.8 ft. Backfilled with soil cuttings	768.3							
30											
35											
40											

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE B-14

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 18, 2020 16:30  
DRILLING END: August 18, 2020 17:15  
COORDINATES: N: 1,391,808 E: 2,201,033

SHEET: 1 of 1  
GS ELEV.: 792  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		792.0						
5			RESIDUUM, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine angular gravel, white to gray; non-cohesive, compact, dry to moist							
10					SM		DO S-02	6-10-10-10 (20)	22 24	20
15							DO S-02	4-7-6-9 (13)	24 24	13
18.0		18.3	PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine angular gravel, white to gray; non-cohesive, very dense, dry to moist Refusal at 18.3 ft. Bottom of borehole at 18.3 ft. Backfilled with soil cuttings	774.0 773.7	SM		DO S-03	50/4" (50/4")	4 4	100
20										
25										
30										
35										
40										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE B-15

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 18, 2020 17:25  
DRILLING END: August 18, 2020 18:45  
COORDINATES: N: 1,391,743 E: 2,201,197

SHEET: 1 of 1  
GS ELEV.: 787  
TOC ELEV.: na  
DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\SSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		787.0						
5			(ML), SANDY SILT, non plastic, fine to coarse sand, trace fine subangular gravel, yellow brown; Bulk Sample		ML					
10		10.0		777.0						
15			RESIDUUM, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine subangular gravel, gray to brown; micaceous, non-cohesive, compact, moist		SM		DO S-01	3-6-8-6 (14)	20 24	
20							DO S-02	8-10-10-11 (20)	0 24	
25							DO S-03	15-13-14-13 (27)	20 24	
30		26.0		761.0			DO S-04	5-5-12-25 (17)	24 24	
		26.5	RESIDUUM, (ML), SANDY SILT, non plastic, fine to medium sand, red-orange; non-cohesive, compact, moist	760.5	ML					
			RESIDUUM, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine subangular gravel, gray; non-cohesive, compact, moist		SM					
35		30.5		756.5			DO S-05	12-50/5" (50/5")	11 11	
40		31.0	PARTIALLY WEATHERED ROCK, SAMPLED AS, (SM), SILTY SAND, fine to coarse, non plastic fines, trace fine subangular gravel, gray; non-cohesive, very dense, moist Refusal at 31.0 ft. Bottom of borehole at 31.0 ft. Backfilled with soil cuttings	756.0	SM					

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE SC-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 31, 2020 11:05  
DRILLING END: July 31, 2020 13:50  
COORDINATES: N: 1,390,228 E: 2,201,410

SHEET: 1 of 2  
GS ELEV.: 753  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		753.0						
5			(SP), GRAVELLY SAND, coarse, poorly graded, coarse gravel, brown to gray; non-cohesive, very loose to compact, wet							
10					SP					
15							DO S-01	1-1-1-5 (2)	6 24	2
20							DO S-02	3-7-11-13 (18)	6 24	18
25										
30										
35										
40										
18.0			RESIDUUM, (ML), GRAVELLY SANDY SILT, non plastic, fine sand, brown with gray; micaceous, non-cohesive, loose, wet	735.0						
20							DO S-03	2-2-3-7 (5)	12 24	5
25					ML		DO S-04	2-3-7-13 (10)	20 24	10
30							DO S-05	1-3-5-6 (8)	16 24	8
33.0			RESIDUUM, (ML), GRAVELLY SANDY SILT, non plastic, fine to medium sand, coarse gravel, brown to tan; non-cohesive, dense to very dense, wet	720.0						
35							DO S-06	23-27-33-45 (60)	14 24	60
40					ML					
Log continued on next page										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\GINT\GINT LOGS\2020\1109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE SC-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: July 31, 2020 11:05  
 DRILLING END: July 31, 2020 13:50  
 COORDINATES: N: 1,390,228 E: 2,201,410

SHEET: 2 of 2  
 GS ELEV.: 753  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		713.0						
		41.5		711.5	ML		DO S-07	4-18-29-50/4" (47)	18	
		42.0		711.0	ML				22	
45			PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), GRAVELLY SANDY SILT, non plastic, fine to medium sand, coarse gravel, brown to tan; non-cohesive, very dense, wet Refusal at 42.0 ft. Bottom of borehole at 42.0 ft. Backfilled with soil cuttings							
50										
55										
60										
65										
70										
75										
80										

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DAV\WWW\ROOT\FILES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



SHEET: 1 of 2  
GS ELEV.: 754  
TOC ELEV.: na  
DATUM: NAD 83

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 30, 2020 13:45  
DRILLING END: July 30, 2020 16:00  
COORDINATES: N: 1,390,224 E: 2,201,335

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



**SC-02**  
1 of 2

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT. - 8/20/21 09:59  
 (GOLDER\ASSOCIATES\SHAREPOINT.COM@SSL\DAVWWW\ROOT\SITES\1103\18\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109\_API\_MCDONOUGH\_LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE SC-02

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: July 30, 2020 13:45  
 DRILLING END: July 30, 2020 16:00  
 COORDINATES: N: 1,390,224 E: 2,201,335

SHEET: 2 of 2  
 GS ELEV.: 754  
 TOC ELEV.: na  
 DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\FILES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
40		40.0		714.0							
45			RESIDUUM, (ML), GRAVELLY SANDY SILT WITH SLIGHT PLASTICITY, coarse sand, brown to tan; micaceous, non-cohesive, compact, wet ( <i>continued</i> ) Sandy CLAYEY SILT, tan to brown		ML		DO S-07	12-18-31-39 (49)	18 24	49	
50		48.0	RESIDUUM, (ML), GRAVELLY SANDY SILT WITH SLIGHT PLASTICITY, tan to black; micaceous, non-cohesive, dense, wet	706.0	ML		DO S-08	5-10-17-26 (27)	18 24	27	
55		51.5	PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), GRAVELLY SANDY SILT WITH SLIGHT PLASTICITY, tan to black; micaceous, non-cohesive, very dense, wet	702.5	ML		DO S-09	33-37-50 (87)	17 18	87	
60		53.0	Refusal at 53.0 ft. Bottom of borehole at 53.0 ft. Backfilled with soil cuttings	701.0							
65											
70											
75											
80											

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree





# RECORD OF BOREHOLE SP-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 29, 2020 08:15  
DRILLING END: July 29, 2020 11:00  
COORDINATES: N: 1,390,744 E: 2,201,815

SHEET: 1 of 2  
GS ELEV.: 782  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		782.0						
5			RESIDUUM, (ML), SANDY SILT, non plastic, fine sand, some fine gravel, brown; micaceous, non-cohesive, loose to compact, dry to wet							
10							DO S-01	7-7-9-11 (16)	16 24	
15					ML		DO S-02	7-5-4-5 (9)	18 24	
20							DO S-03	3-3-6-9 (9)	24 24	
25							TP ST-01		24 24	
30							DO S-04	7-7-8-11 (15)	24 24	
35							DO S-05	7-11-16-18 (27)	24 24	
40			RESIDUUM, (SM), SILTY SAND, some gravel, orange with brown; micaceous, non-cohesive, compact, wet		SM		DO S-06	5-7-18-35 (25)	24 24	
					ML					

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\FROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



# RECORD OF BOREHOLE SP-01

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: July 29, 2020 08:15  
 DRILLING END: July 29, 2020 11:00  
 COORDINATES: N: 1,390,744 E: 2,201,815

SHEET: 2 of 2  
 GS ELEV.: 782  
 TOC ELEV.: na  
 DATUM: NAD 83

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DAV\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
40		40.0		742.0						
			RESIDUUM, (ML), GRAVELLY SANDY SILT, non plastic, orange with brown; micaceous, non-cohesive, compact to dense, wet (continued)				DO S-07	7-11-14-19 (25)	24 24	
45							DO S-08	7-8-12-15 (20)	24 24	
50					ML		DO S-09	9-18-26-33 (44)	24 24	
55							DO S-10	8-16-26-28 (42)	18 24	
60							DO S-11	19-32-50 (82)	18 18	
65		61.5	PARTIALLY WEATHERED ROCK, SAMPLED AS, (ML), GRAVELLY SANDY SILT, non plastic, orange with brown; micaceous, non-cohesive, compact to very dense, wet	720.5	ML		DO S-12	13-50/4" (50/4")	10 10	
68.0		68.0		714.0						
70			Refusal at 68.0 ft. Bottom of borehole at 68.0 ft. Backfilled with soil cuttings							
75										
80										

DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Cliff Lackey  
 DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree





# RECORD OF BOREHOLE SP-02

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: July 29, 2020 13:45  
DRILLING END: July 29, 2020 15:20  
COORDINATES: N: 1,390,523 E: 2,201,752

SHEET: 1 of 2  
GS ELEV.: 774  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
0		0.0		774.0							
5			RESIDUUM, (ML), SANDY GRAVELLY SILT, non plastic, brown to tan; non-cohesive, compact, dry to wet								
10											
15											
20											
25											
30											
35											
40											

Log continued on next page

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Cliff Lackey  
DRILL RIG: CME 75

LOGGED: Ayushi Tiwari  
CHECKED: K. Gray  
REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M GDT - 8/20/21 09:59  
\\GOLDER\ASSOCIATES\SHAREPOINT\COM\SSL\DAV\WWW\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\2020\1109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
\\GOLDERASSOCIATES.SHAPEPOINT.COM@SSL.DAVWWWROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109 AP1 MCDONOUGH LOGS\_COMBINED.GPJ

RECORD OF BOREHOLE SP-02										SHEET: 2 of 2			
PROJECT: Plant McDonough - Barrier Wall Field Investigation				DRILLING START: July 29, 2020 13:45				GS ELEV.: 774					
PROJECT NO.: 19124362				DRILLING END: July 29, 2020 15:20				TOC ELEV.: na					
LOCATION: Atlanta, Georgia				COORDINATES: N: 1,390,523 E: 2,201,752				DATUM: NAD 83					
DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft		NOTES WATER LEVELS	ADDITIONAL LAB TESTING	
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	WATER CONTENT (%)			
										W <sub>e</sub>			W <sub>i</sub>
40		40.0		734.0									
		41.5		732.5	ML		DO S-07	17-28-50/5" (78/11")	6 17				
		43.0	PARTIALLY WEATHERED ROCK, SAMPLED AS, (GM), SANDY SILTY GRAVEL, coarse, brown; non-cohesive, very dense, wet Refusal at 43.0 ft. Bottom of borehole at 43.0 ft. Backfilled with soil cuttings	731.0	GM								
45													
50													
55													
60													
65													
70													
75													
80													
DRILLING CO.: Betts Environmental Drilling													
DRILLER: Cliff Lackey													
DRILL RIG: CME 75													
LOGGED: Ayushi Tiwari													
CHECKED: K. Gray													
REVIEWED: Pieter DePree													





# RECORD OF BOREHOLE SP-03

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
PROJECT NO.: 19124362  
LOCATION: Atlanta, Georgia

DRILLING START: August 17, 2020 16:15  
DRILLING END: August 17, 2020 06:30  
COORDINATES: N: 1,390,290 E: 2,201,514

SHEET: 1 of 2  
GS ELEV.: 756  
TOC ELEV.: na  
DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)	
0		0.0		756.0						
5			(ML), SANDY SILT, non plastic, fine to coarse sand, trace fine subangular gravel, brown; cohesive, w ~ PL		ML					
8.0		8.0	(ML), SANDY SILT, non plastic, fine to coarse sand, trace fine subangular gravel, brown to gray; non-cohesive, loose to compact, moist to wet	748.0	ML		DO S-01	2-2-3-3 (5)	18 24	5
10										
15					ML		DO S-02	12-14-17-18 (31)	16 24	31
20										
22.0		22.0	RESIDUUM, (ML), SILT AND SAND, non plastic, and fine to coarse SAND, trace fine subangular to angular gravel, brown to gray; non-cohesive, loose to dense, wet	734.0	ML		DO S-03	14-15-21-22 (36)	24 24	36
25										
30							DO S-04	8-7-7-8 (14)	17 24	14
35										
35					ML		DO S-05	7-11-9-12 (20)	13 24	20
40										
40							DO S-06	2-2-5-6 (7)	14 24	7
Log continued on next page										

DRILLING CO.: Betts Environmental Drilling  
DRILLER: Scott Sanders  
DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
CHECKED: K. Gray  
REVIEWED: Pieter DePree





# RECORD OF BOREHOLE SP-03

PROJECT: Plant McDonough - Barrier Wall Field Investigation  
 PROJECT NO.: 19124362  
 LOCATION: Atlanta, Georgia

DRILLING START: August 17, 2020 16:15  
 DRILLING END: August 17, 2020 06:30  
 COORDINATES: N: 1,390,290 E: 2,201,514

SHEET: 2 of 2  
 GS ELEV.: 756  
 TOC ELEV.: na  
 DATUM: NAD 83

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic	REC ATT (in)		
40		40.0		716.0							
		41.0	Transitions to partially weathered rock	715.0	ML		DO S-07	24-27-20-27 (47)	24 24	<div> <div>20406080</div> <div>W<sub>p</sub> ——— W<sub>L</sub></div> <div>20406080</div> </div>	
45			Refusal at 42.0 ft. Bottom of borehole at 42.0 ft.								
50											
55											
60											
65											
70											
75											
80											

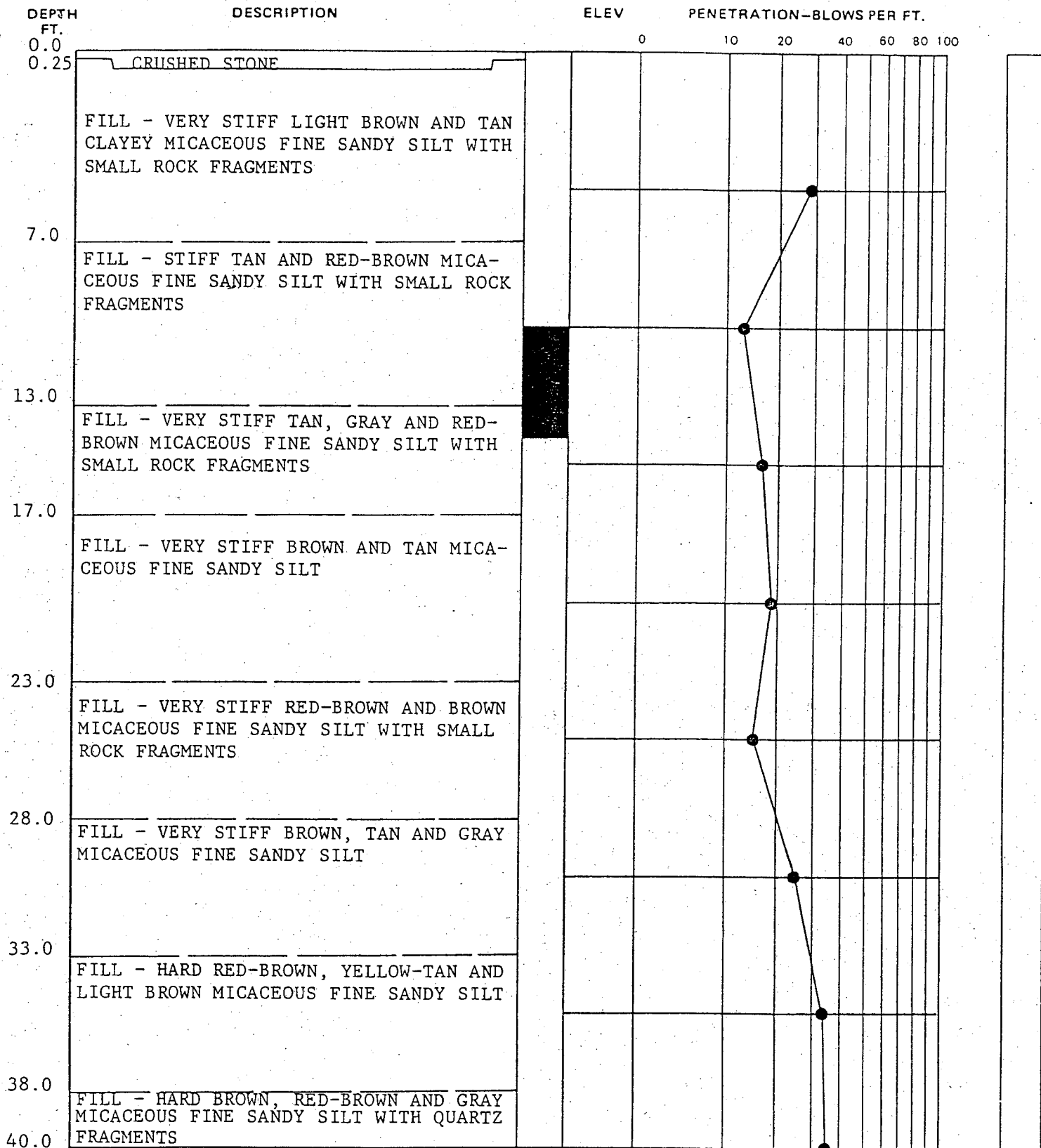
DRILLING CO.: Betts Environmental Drilling  
 DRILLER: Scott Sanders  
 DRILL RIG: Geoprobe 7822

LOGGED: Nick Moran  
 CHECKED: K. Gray  
 REVIEWED: Pieter DePree



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 8/20/21 09:59  
 \GOLDER\ASSOCIATES\SHAREPOINT.COM\SSL\DATA\WWW\ROOT\SITES\110318\PROJECT FILES\5 TECHNICAL WORK\300 FIELD INFORMATION\GINT LOGS\20201109\_AP1 MCDONOUGH\_LOGS\_COMBINED.GPJ





CONTINUED

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE  
50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.  
WATER TABLE, 1 HR.  
LOSS OF DRILLING WATER

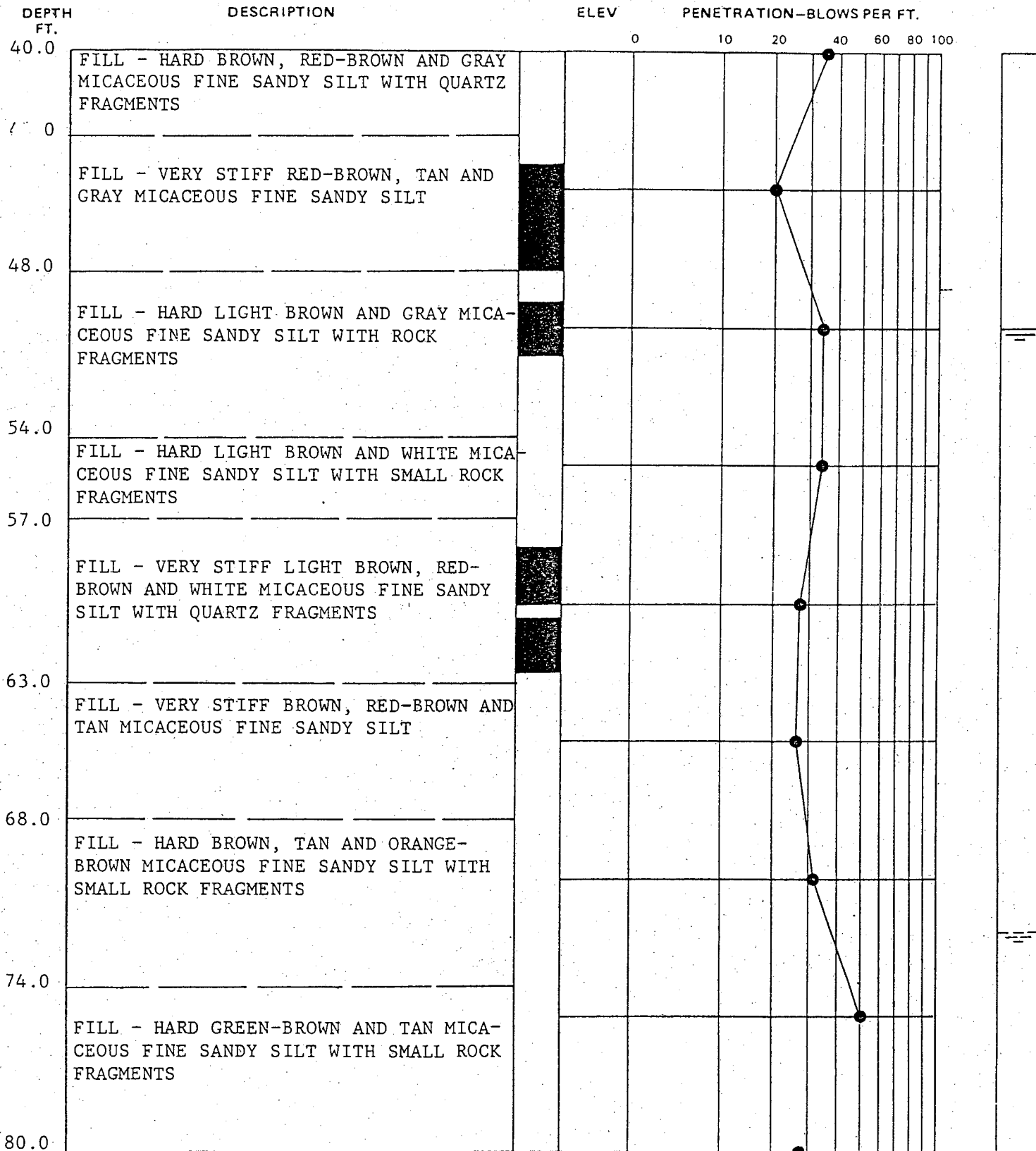
### TEST BORING RECORD

BORING NO. AP-1 (pg. 1 of 3)  
DATE DRILLED 8/13-14/81  
LAB NO. 80500  
JOB NO. 4083

ATE 117

846  
26  
104





CONTINUED

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE  
50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.  
WATER TABLE, 1 HR.  
LOSS OF DRILLING WATER

### TEST BORING RECORD

BORING NO. AP-1 (pg. 2 of 3)  
DATE DRILLED 8/13-14/81  
LAB NO. 80500  
JOB NO. 4083

ATE 117



DEPTH  
FT.  
80.0

DESCRIPTION

ELEV

PENETRATION—BLOWS PER FT.

0 10 20 40 60 80 100

88.0

93.0

110.0

VERY STIFF TO HARD BROWN, RED-BROWN  
AND TAN MICACEOUS FINE SANDY SILT

HARD GRAY AND TAN MICACEOUS FINE SANDY  
SILT

VERY HARD BROWN, GRAY AND TAN HIGHLY  
MICACEOUS FINE SANDY SILT (PARTIALLY  
WEATHERED ROCK)

BORING TERMINATED

50/5"

50/2"

50/4"

50/2"

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

| 50 | % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

### TEST BORING RECORD

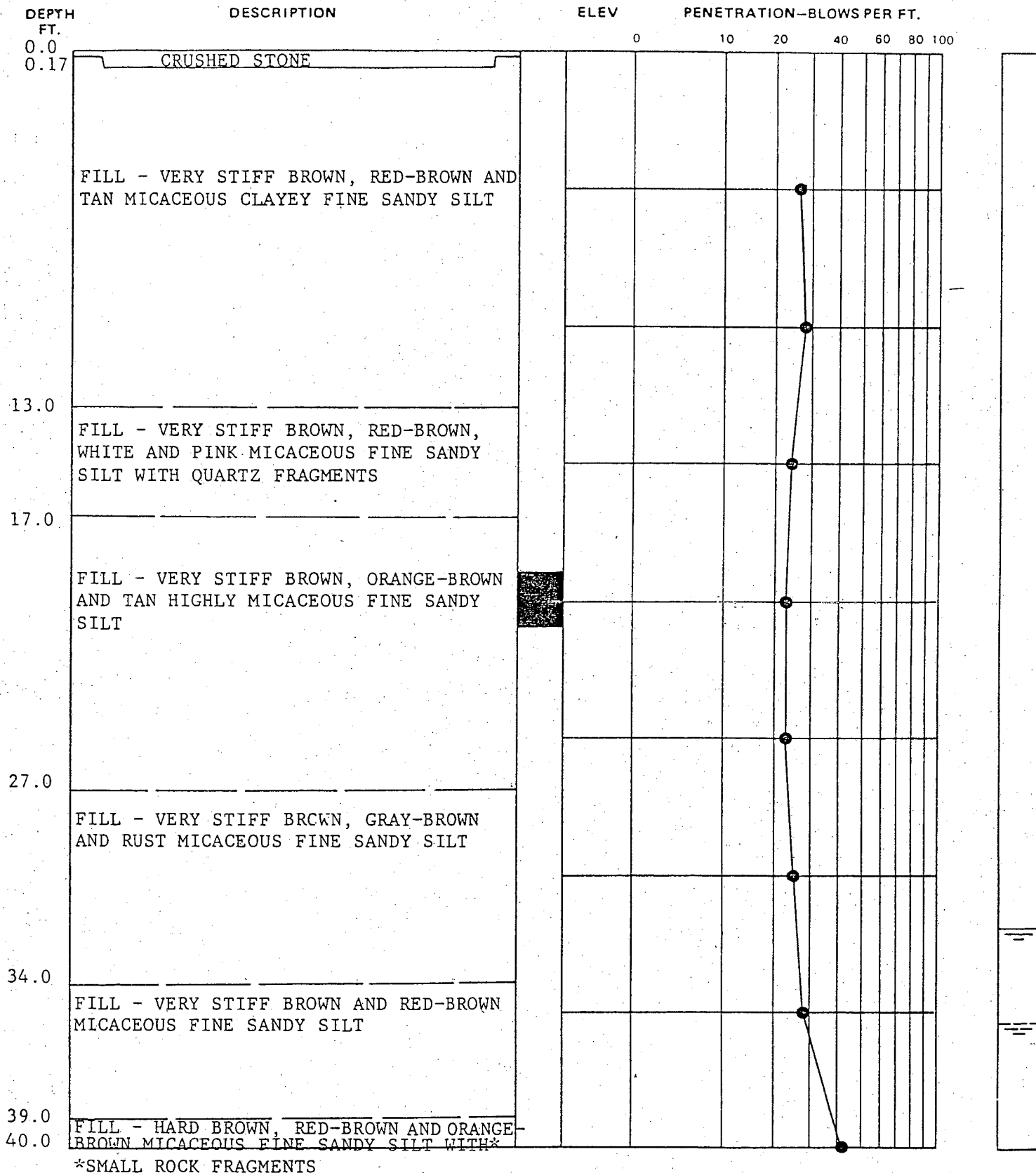
BORING NO. AP-1 (pg. 3 of 3)  
DATE DRILLED 8/13-14/81  
LAB NO. 80500  
JOB NO. 4083

ATE 117

8/16

734





CONTINUED

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE  
| 50 | % ROCK CORE RECOVERY

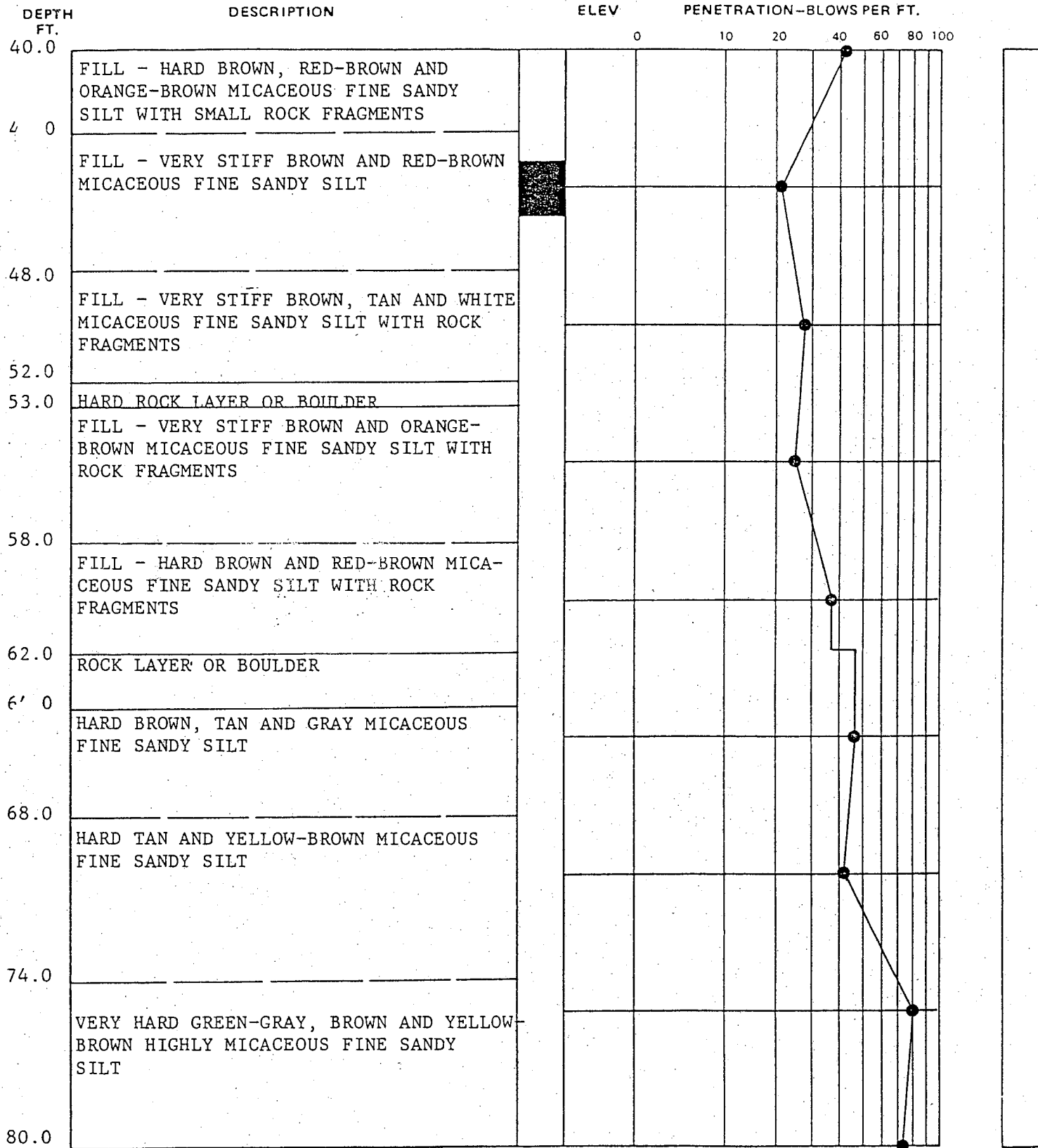
WATER TABLE, 24 HR.  
WATER TABLE, 1 HR.  
LOSS OF DRILLING WATER

# TEST BORING RECORD

BORING NO. AP-2 (pg. 1 of 3)  
DATE DRILLED 8/19-20/81  
LAB NO. 80500  
JOB NO. 4083

ATE 117





CONTINUED

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

### TEST BORING RECORD

BORING NO. AP-2 (pg. 2 of 3)

DATE DRILLED 8/19-20/81

LAB NO. 80500

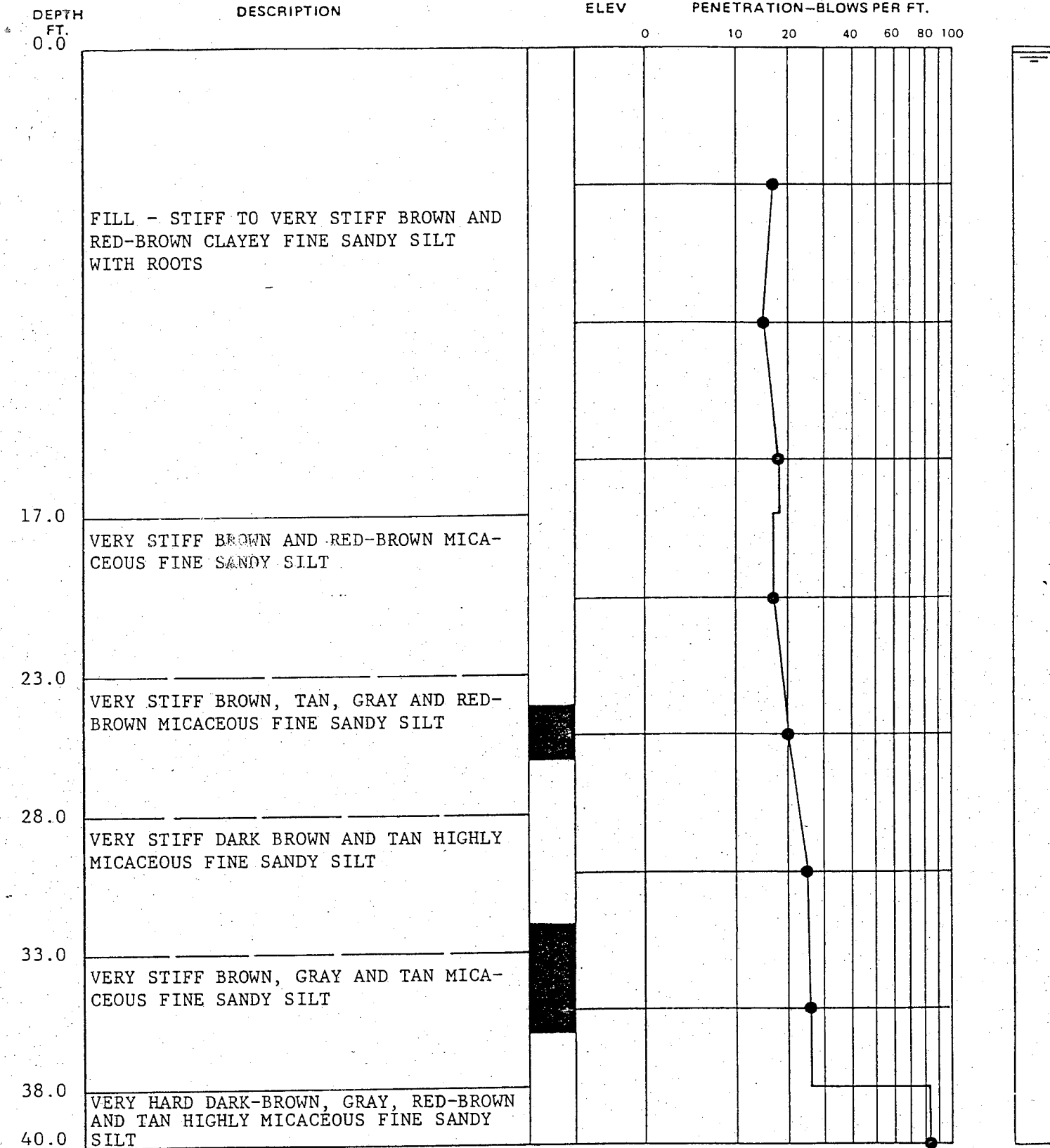
JOB NO. 4083

ATE 117









CONTINUED

atlanta testing & engineering

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE  
50% ROCK CORE RECOVERY

WATER TABLE, 24 HR.  
WATER TABLE, 1 HR.  
LOSS OF DRILLING WATER

### TEST BORING RECORD

BORING NO. AP-3 (pg. 1 of 2)  
DATE DRILLED 8/21-24/81  
LAB NO. 80500  
JOB NO. 4083

ATE 117



PENETRATION-BLOWS PER FT.

0 10 20 40 60 80 100

VERY HARD DARK-BROWN, GRAY, RED-BROWN  
AND TAN HIGHLY MICACEOUS FINE SANDY  
SILT

BORING TERMINATED

50/51

## atlanta testing &amp; engineering

**BORING AND SAMPLING MEETS ASTM D-1586**  
**CORE DRILLING MEETS ASTM D-2113**

NETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

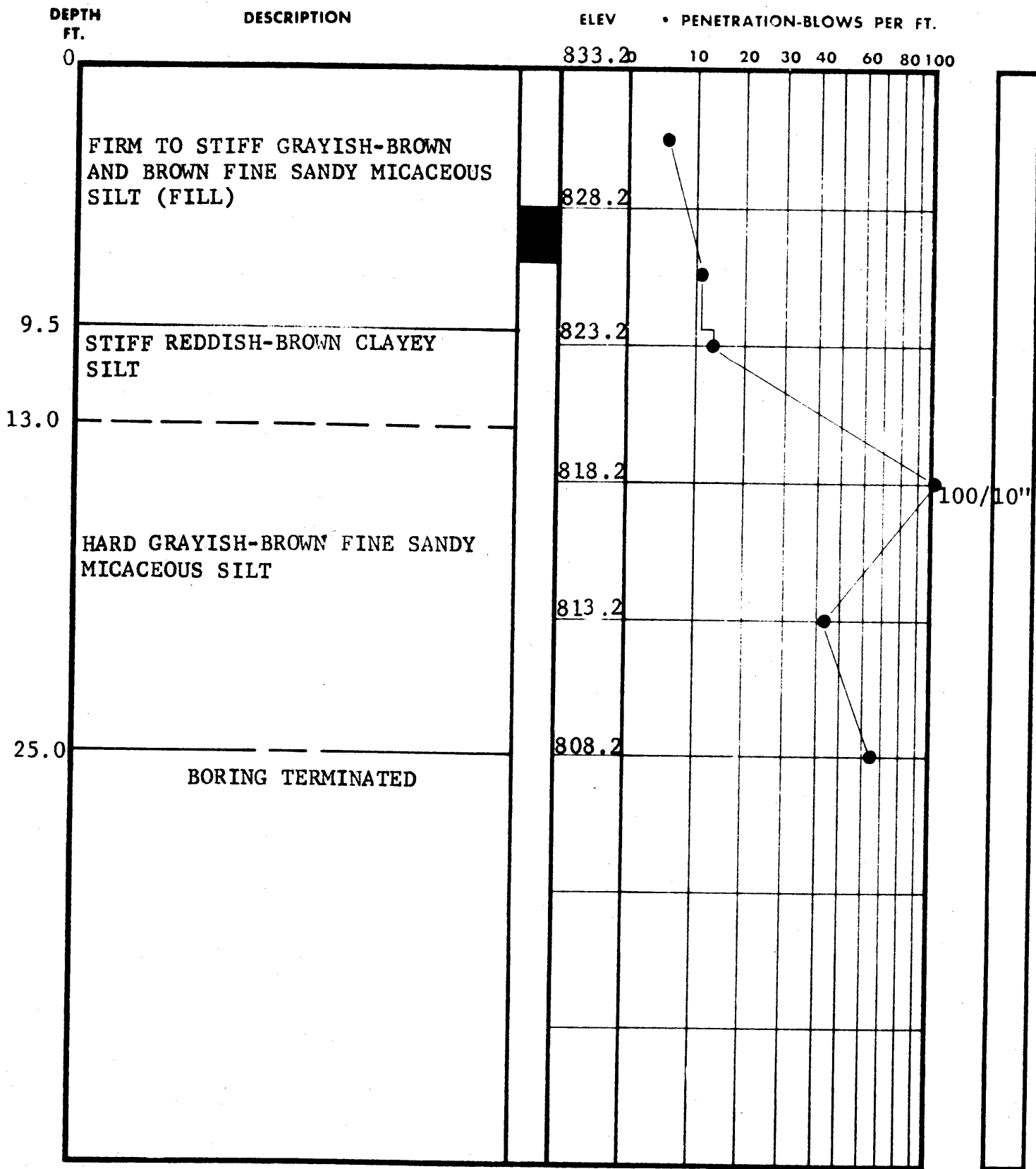
WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
 LOSS OF DRILLING WATER

# TEST BORING RECORD

BORING NO. AP-3 (pg. 2 of 2)  
DATE DRILLED 8/21-24/81  
LAB NO. 80500  
JOB NO. 4083 ATE 117

ATE 117





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-101

DATE DRILLED 3/5/68

JOB NO. 5862

jj

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

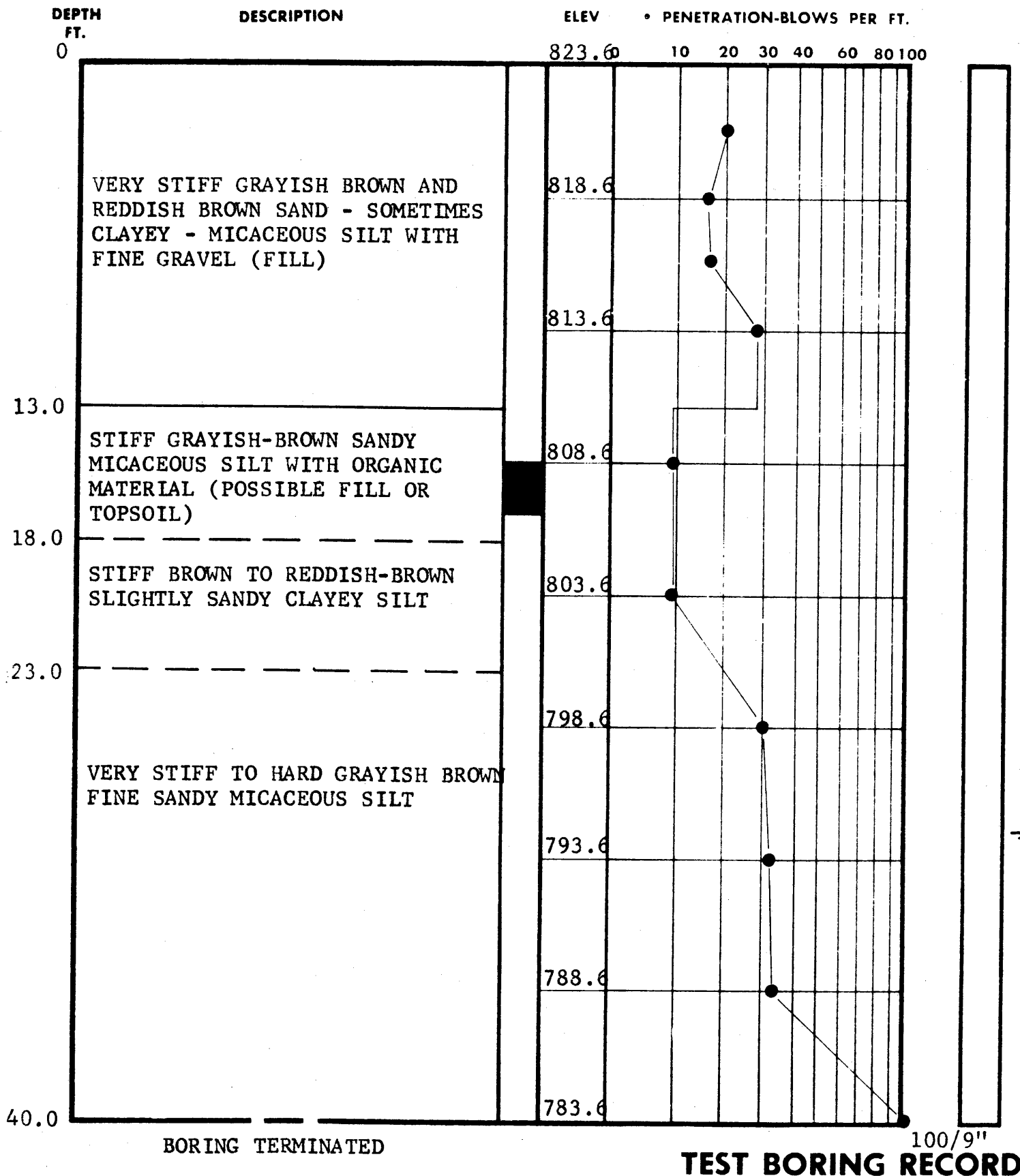
WATER TABLE, 1 HR.

50% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-102  
DATE DRILLED 8/2/68  
JOB NO. 5862

jj  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

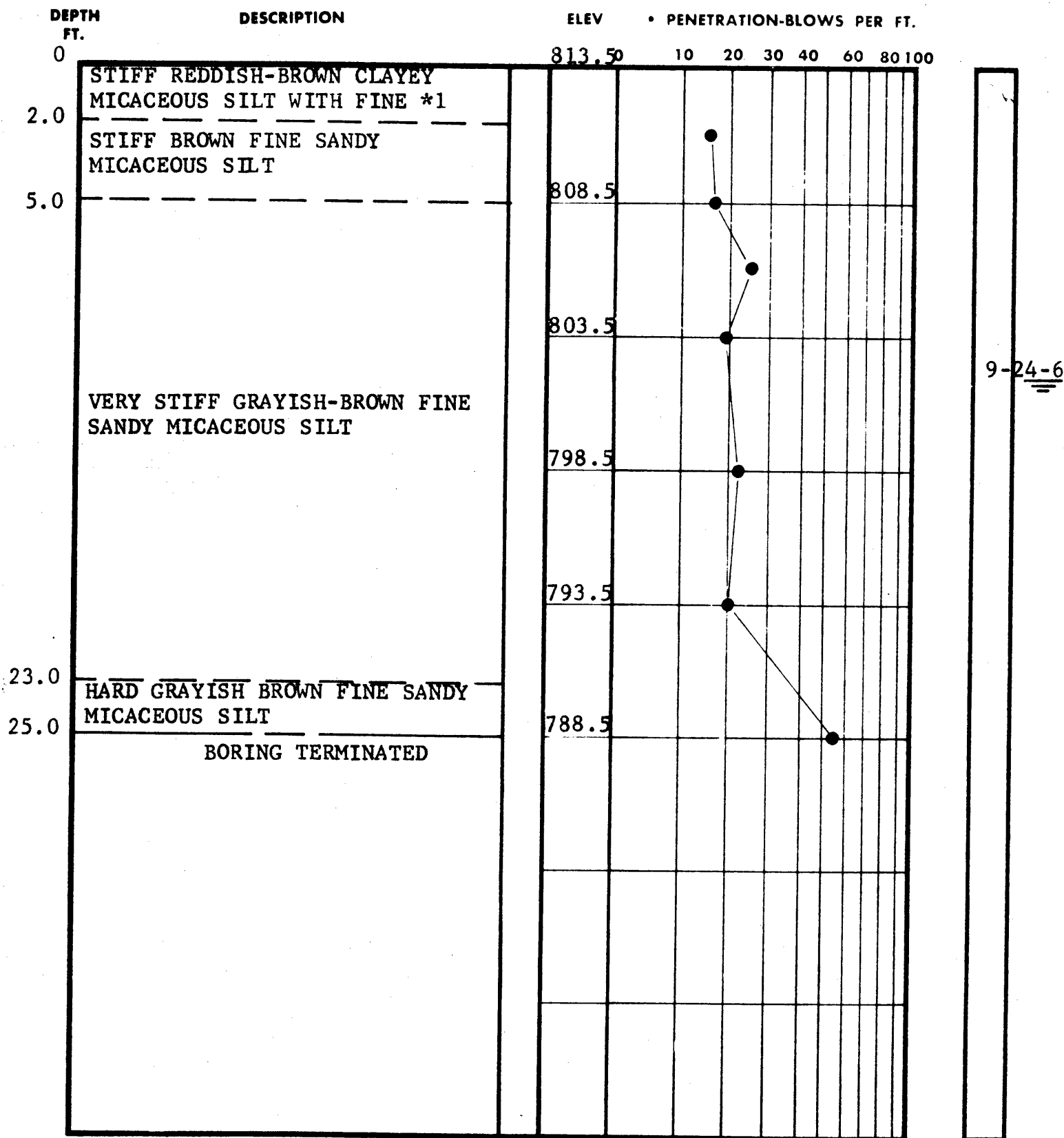
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED AT TIME OF BORING

\*1 QUARTZ GRAVEL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-103

DATE DRILLED 8/2/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

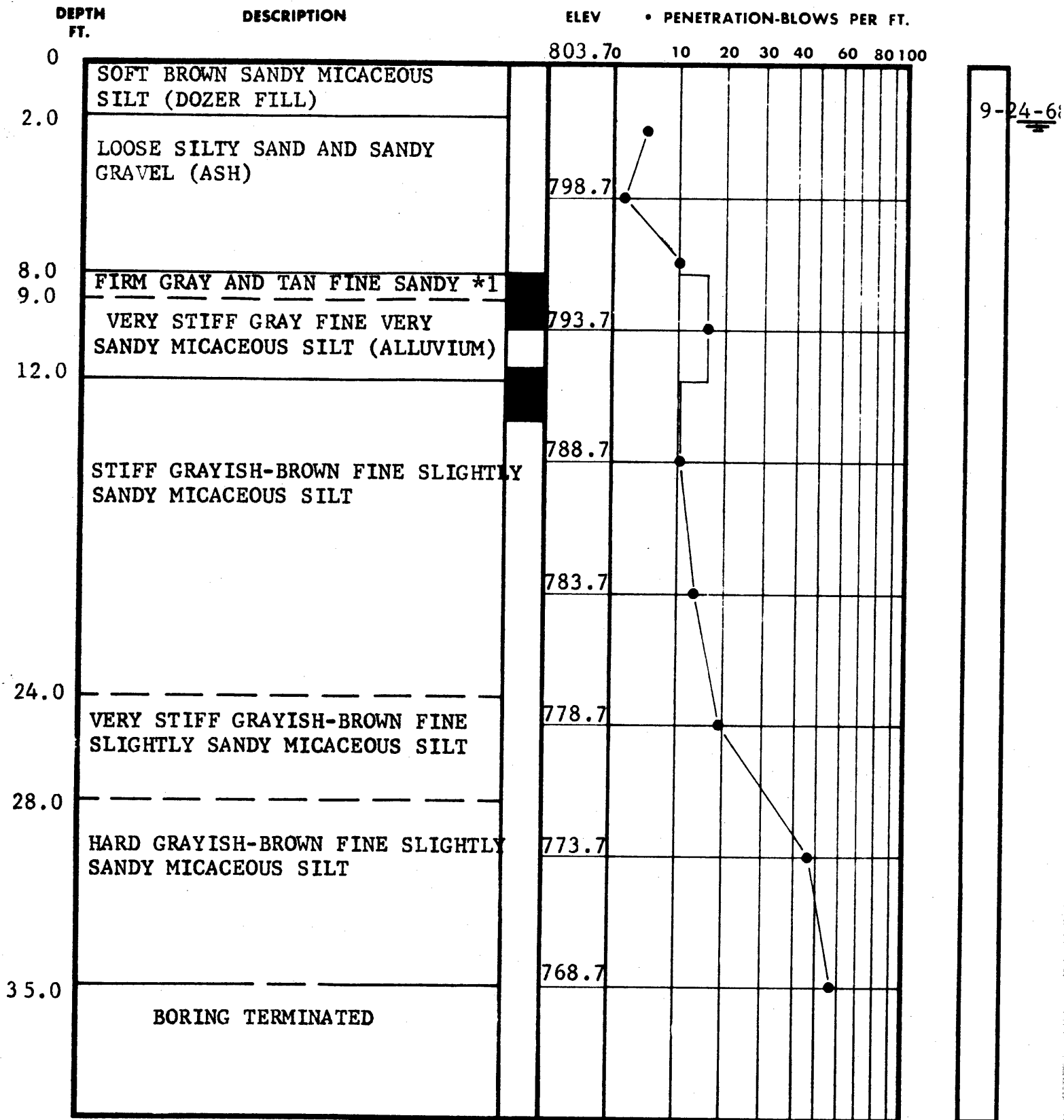
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 SLIGHTLY CLAYEY MICACEOUS SILT (ALLUVIUM)

## TEST BORING RECORD




BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-104

DATE DRILLED 8/2/68

JOB NO. 5862

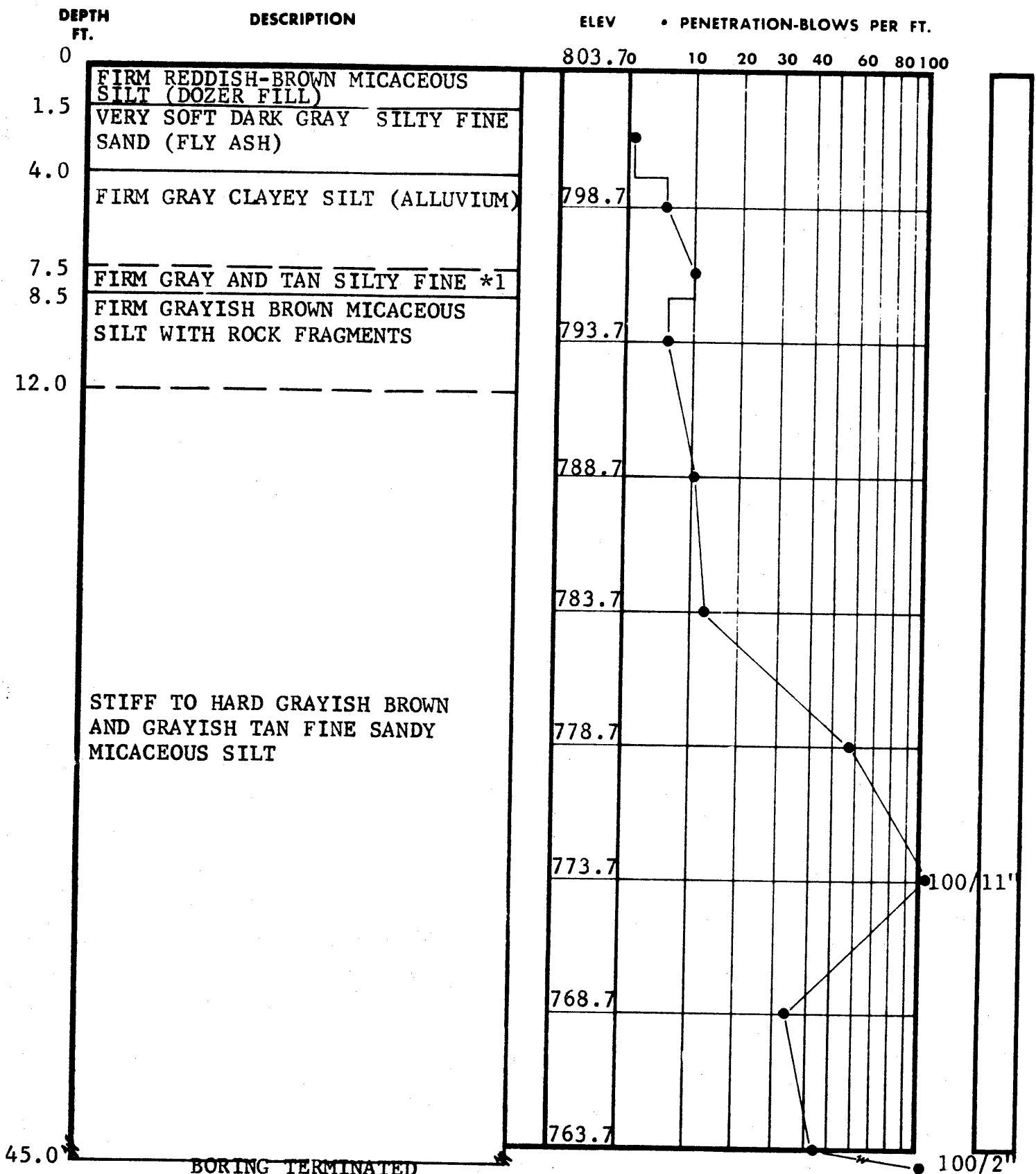
jj  UNDISTURBED SAMPLE  WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 TO COARSE SAND WITH SOME FINE GRAVEL (ALLUVIUM)

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

% ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

## TEST BORING RECORD

BORING NO. B-105

DATE DRILLED 8/1/68

JOB NO. 5862

LAW ENGINEERING TESTING CO.



DEPTH  
FT.

DESCRIPTION

ELEV

• PENETRATION-BLOWS PER FT.

802.7

10

20

30

40

60

80

100

0

SOFT BROWN FINE SANDY MICACEOUS  
SILT (DOZER FILL)

2.0

LOOSE BLACK FINE TO MEDIUM SILTY  
SAND AND FINE TO COARSE SANDY  
GRAVEL (ASH)

8.0

SOFT BLACK ORGANIC SILT AND  
SOFT GRAY FINE SANDY SILT\*FIRM GRAY FINE SANDY SILT  
(ALLUVIUM)

12.0

STIFF GRAY FINE SANDY MICACEOUS  
SILT

18.0

VERY STIFF GRAY FINE SANDY  
MICACEOUS SILT

27.0

HARD TO VERY HARD GRAY TO GRAYISH-  
BROWN FINE SANDY MICACEOUS SILT

35.0

BORING TERMINATED

797.7

792.7

787.7

782.7

777.7

772.7

767.7

100/5"

\* (ALLUVIUM)

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.BORING NO. B-106DATE DRILLED 8/1/68JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

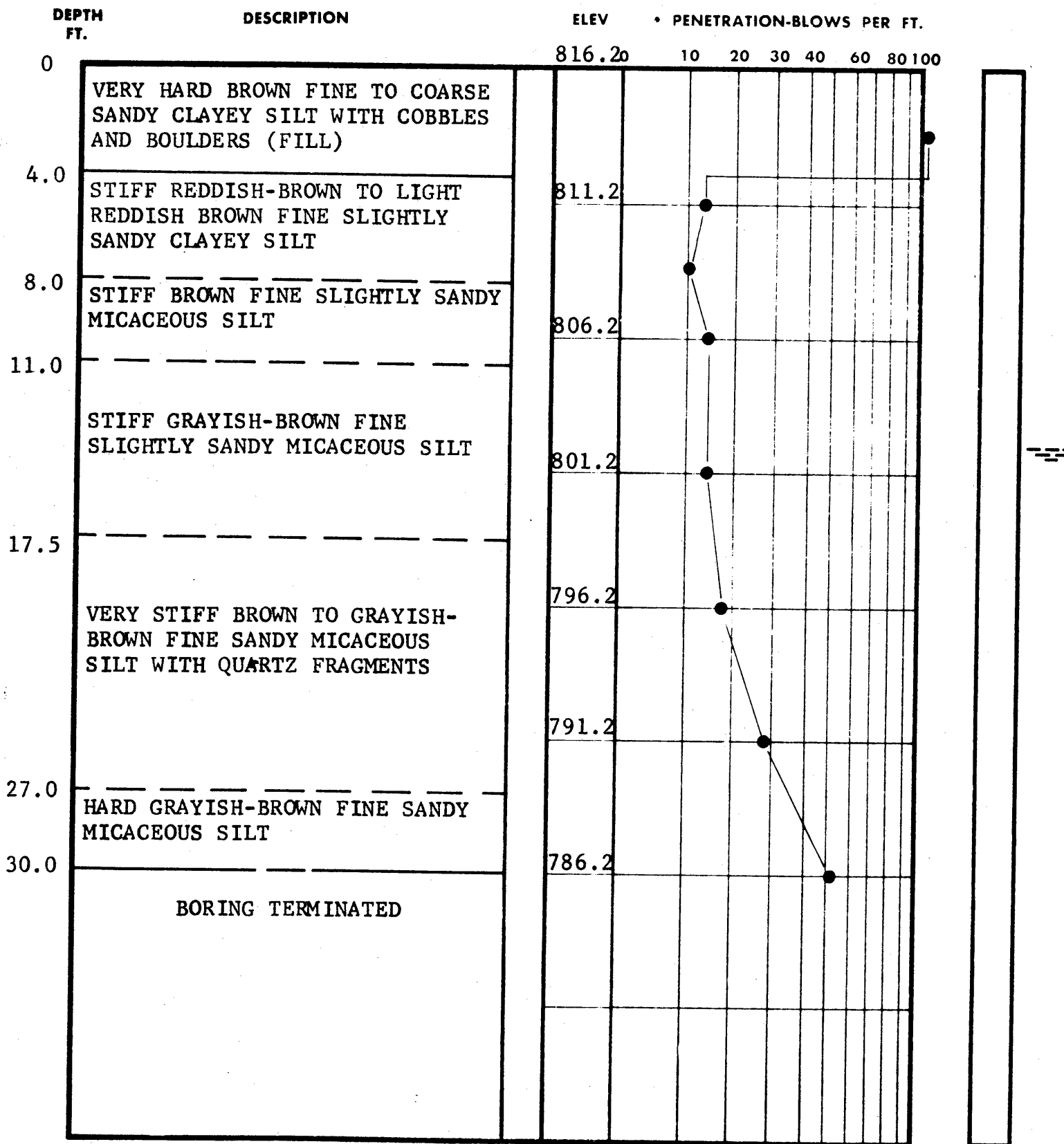
WATER TABLE, 1 HR.

50% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-107

DATE DRILLED 8/1/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

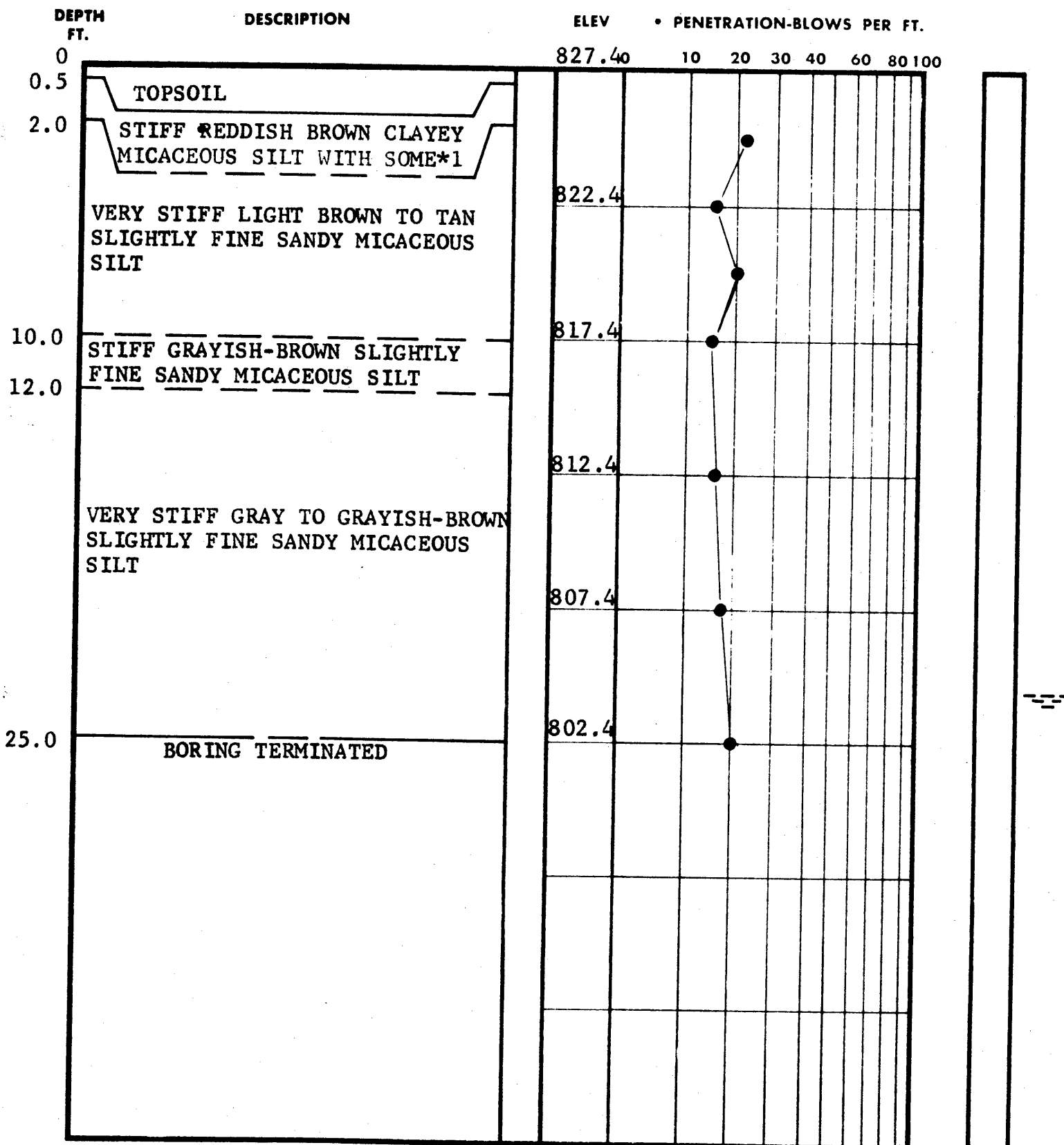
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 FINE GRAVEL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-108

DATE DRILLED 8/1/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

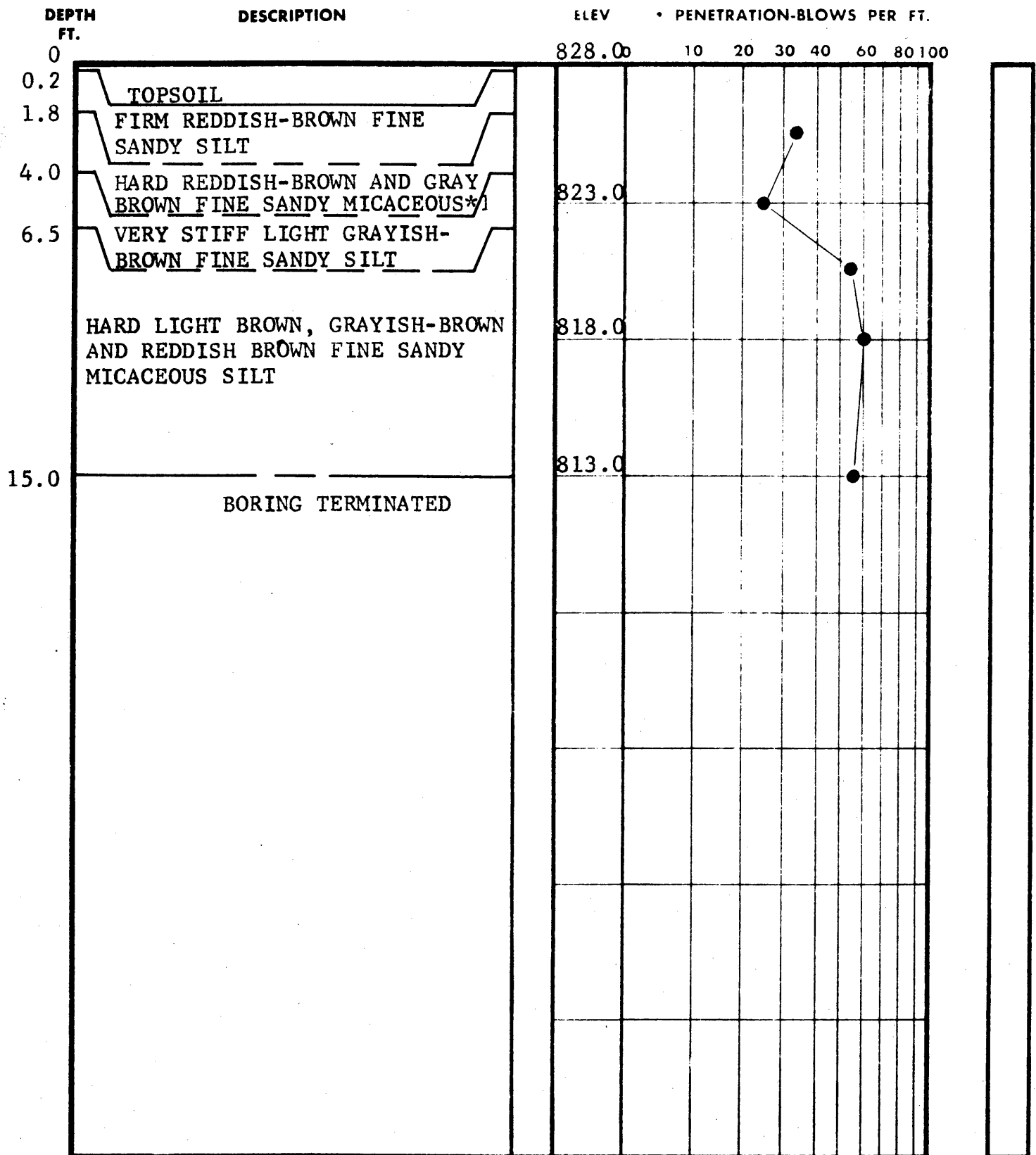
 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED  
\*1 SILT

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-109  
DATE DRILLED 7/25/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

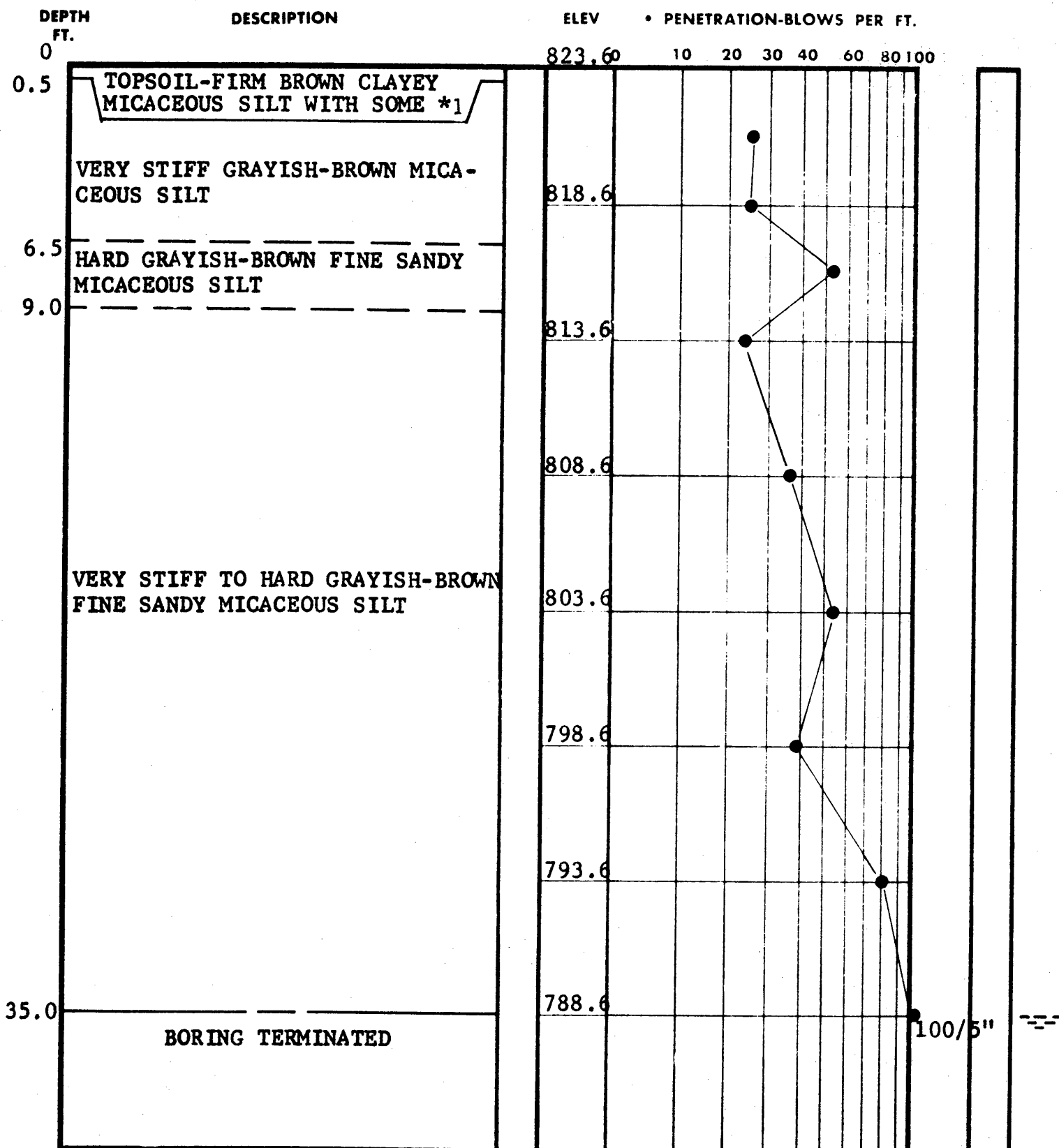
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 FINE GRAVEL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-110

DATE DRILLED 7/30/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

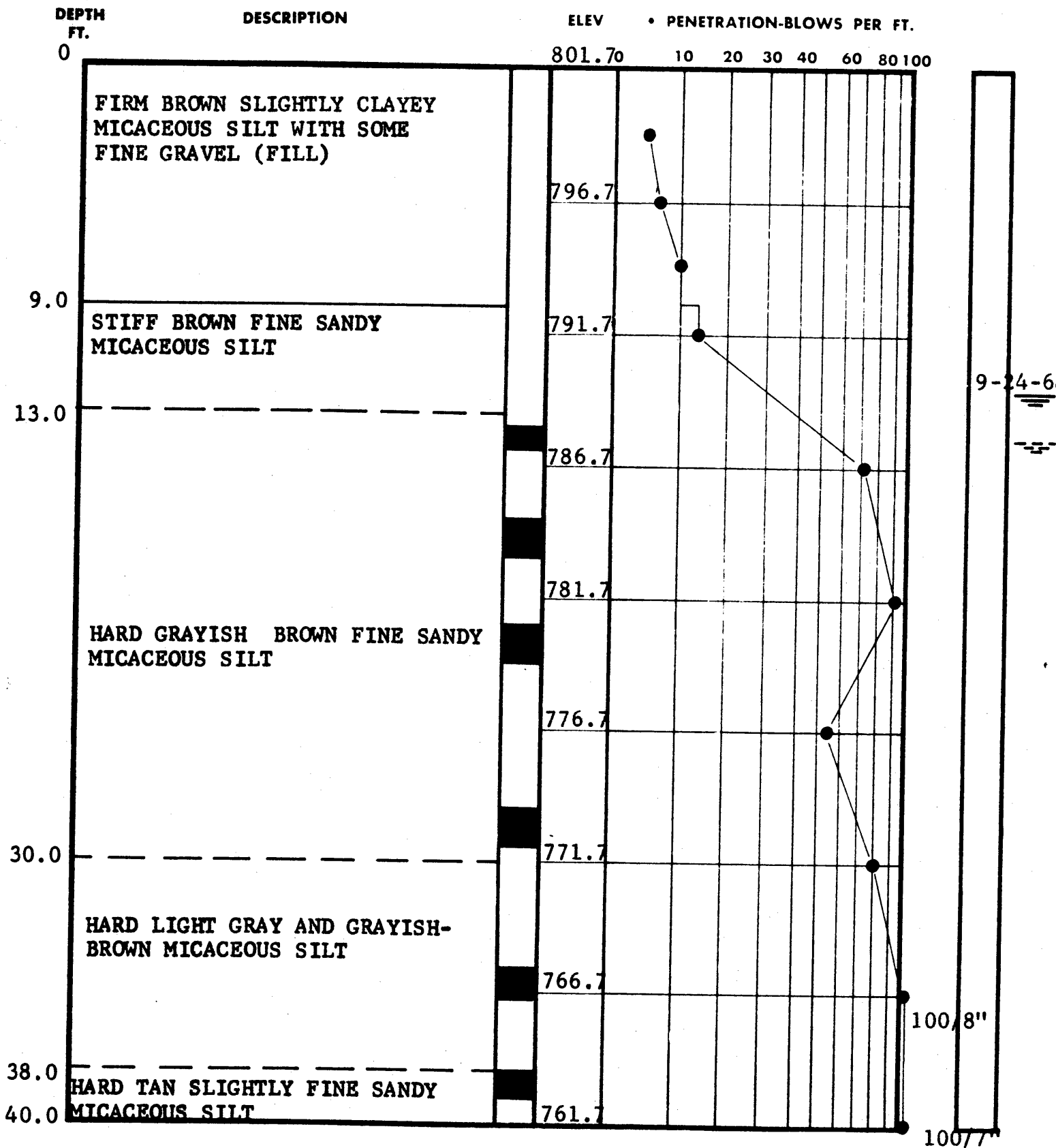
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-111

DATE DRILLED 7/30/68

JOB NO. 5862

PAGE 1 of 2

UNDISTURBED SAMPLE

50% ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.











DEPTH FT.	DESCRIPTION	CORE BIT %	ELEV. SIZE	REMARKS
9.0			786.3	
	MODERATELY HARD GRAY SCHIST	80	781.3	9.0'-14.0' HIGHLY FRACTURED, NUMEROUS STAINED JOINTS (PIECES 1/2"-6" IN LENGTH)
17.3		100		JOINTS DIPPING 40°, 60°, 70°, SOME INTER- SECTING
	HARD GRAY SCHIST	NX	776.3	14.0'-15.6' FRACTURED (PIECES 1"-6" IN LENGTH)
		94		15.6'-16.3' HIGHLY FRACTURED (PIECES LESS THAN 1" IN LENGTH)
24.0			771.3	16.5'-16.8' CLOSED JOINT DIPPING 60°
	CORING TERMINATED			16.8'-17.1' HIGHLY FRACTURED (PIECES LESS THAN 1" IN LENGTH)
				17.1'-19.0' FRACTURED (PIECES 1"-6" IN LENGTH)
				17.8'-18.0' OPEN JOINT DIPPING 50°
				18.3'-18.7' CLOSED INTERSECTING JOINTS DIPPING AT 60° AND 40°
				20.3'-20.8' OPEN STAINED JOINTS DIPPING 50°
				21.5' STAINED FRACTURE
				21.5'-22.1' NUMEROUS CLOSED JOINTS DIPPING 80°

LOST 50% OF DRILLING WATER AT 12 FEET



NO GROUND WATER ENCOUNTERED AT TIME OF BORING

LAW ENGINEERING TESTING CO.



DEPTH  
FT.  
8.5

DESCRIPTION

CORE BIT ELEV.  
% SIZE 779.4

REMARKS

HARD GRAY SCHIST

100

774.4

100

NX

769.4

100

764.4

8.5'-8.7' CLOSED  
VERTICAL JOINT  
8.5'-13.5' CONTINUOUS

18.2'-18.9' OPEN JOINT  
DIPPING 60°  
19.4'-OPEN FRACTURE

8.5'-23.5' HARD AND  
CONTINUOUS

23.5

CORING TERMINATED

NO DRILLING WATER LOSS RECORDED

PAGE 2 of 2

CORE BORING RECORD

BORING NO. 113  
JOB NO. 5862

jj

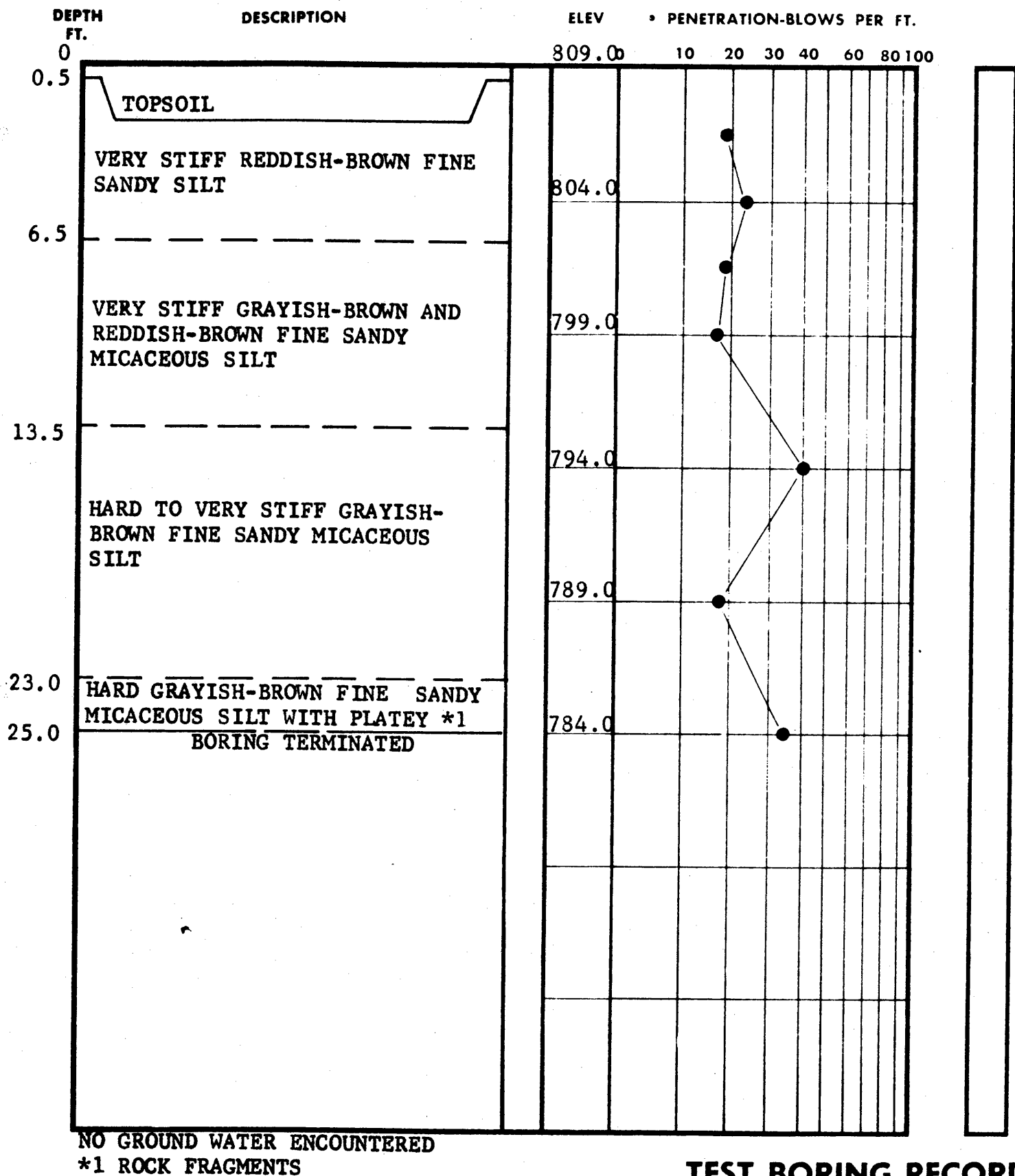
WATER TABLE

LAW ENGINEERING TESTING CO.









NO GROUND WATER ENCOUNTERED  
\*1 ROCK FRAGMENTS

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-115  
DATE DRILLED 7/25/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

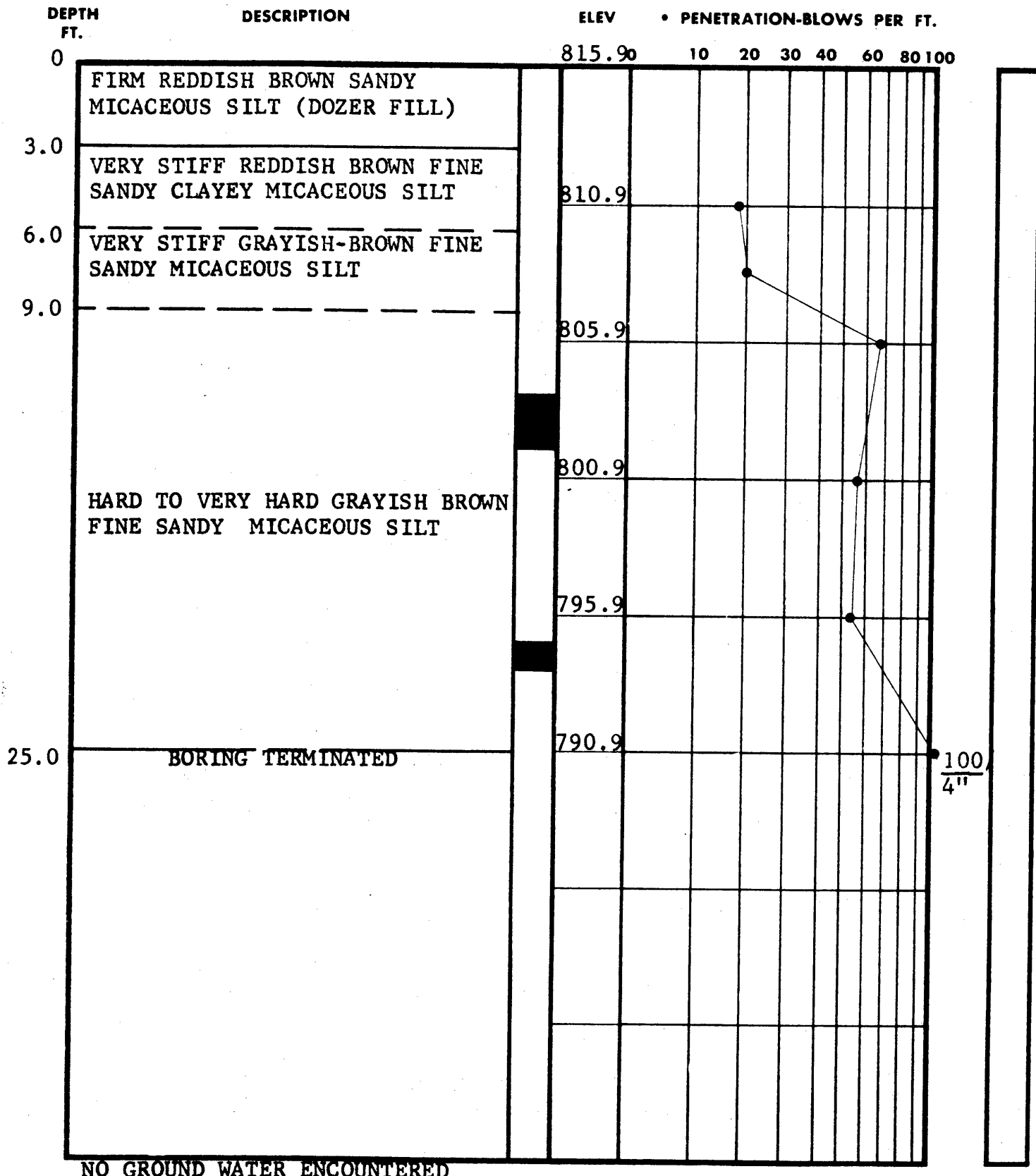
 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.













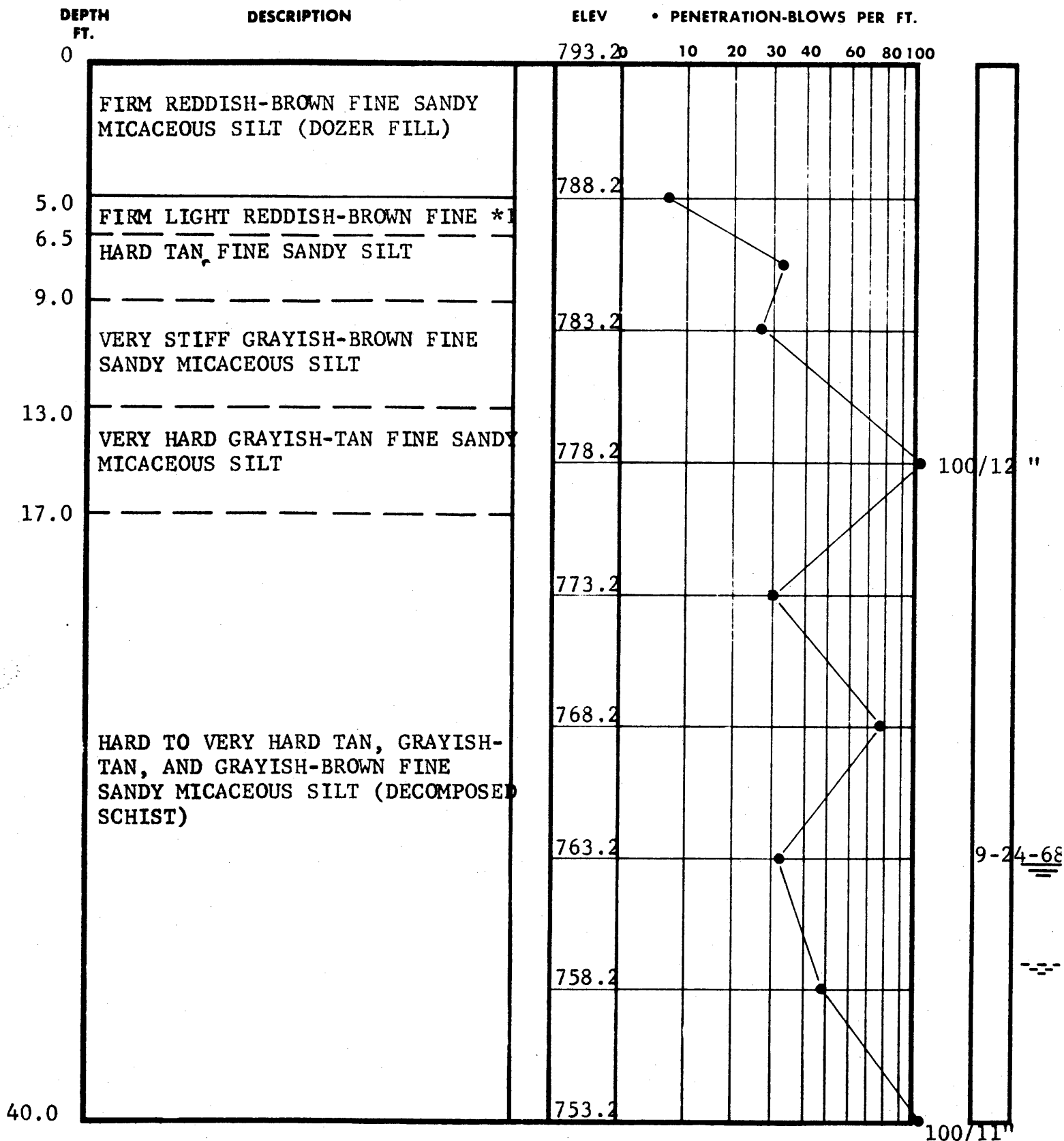
TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-117  
DATE DRILLED 8/5/68  
JOB NO. 5862

jj  UNDISTURBED SAMPLE  
 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
 LOSS OF DRILLING WATER  
|50| % ROCK CORE RECOVERY





\*1 SANDY SILT

PAGE 1 of 2

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-118

DATE DRILLED 8/5/68

JOB NO. 5862

jj

■ UNDISTURBED SAMPLE

≡ WATER TABLE, 24 HR.

≡ WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	ELEV • PENETRATION-BLOWS PER FT.											
		753.20	10	20	30	40	60	80	100				
40.0	HARD TO VERY HARD TAN, GRAYISH TAN, AND GRAYISH-BROWN FINE SANDY MICACEOUS SILT (DECOMPOSED SCHIST)												100/11"
		748.2											100/6"
		743.2											100/4"
		738.2											100/1 1/2"
55.0	BORING TERMINATED												

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-118

DATE DRILLED 8/5/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

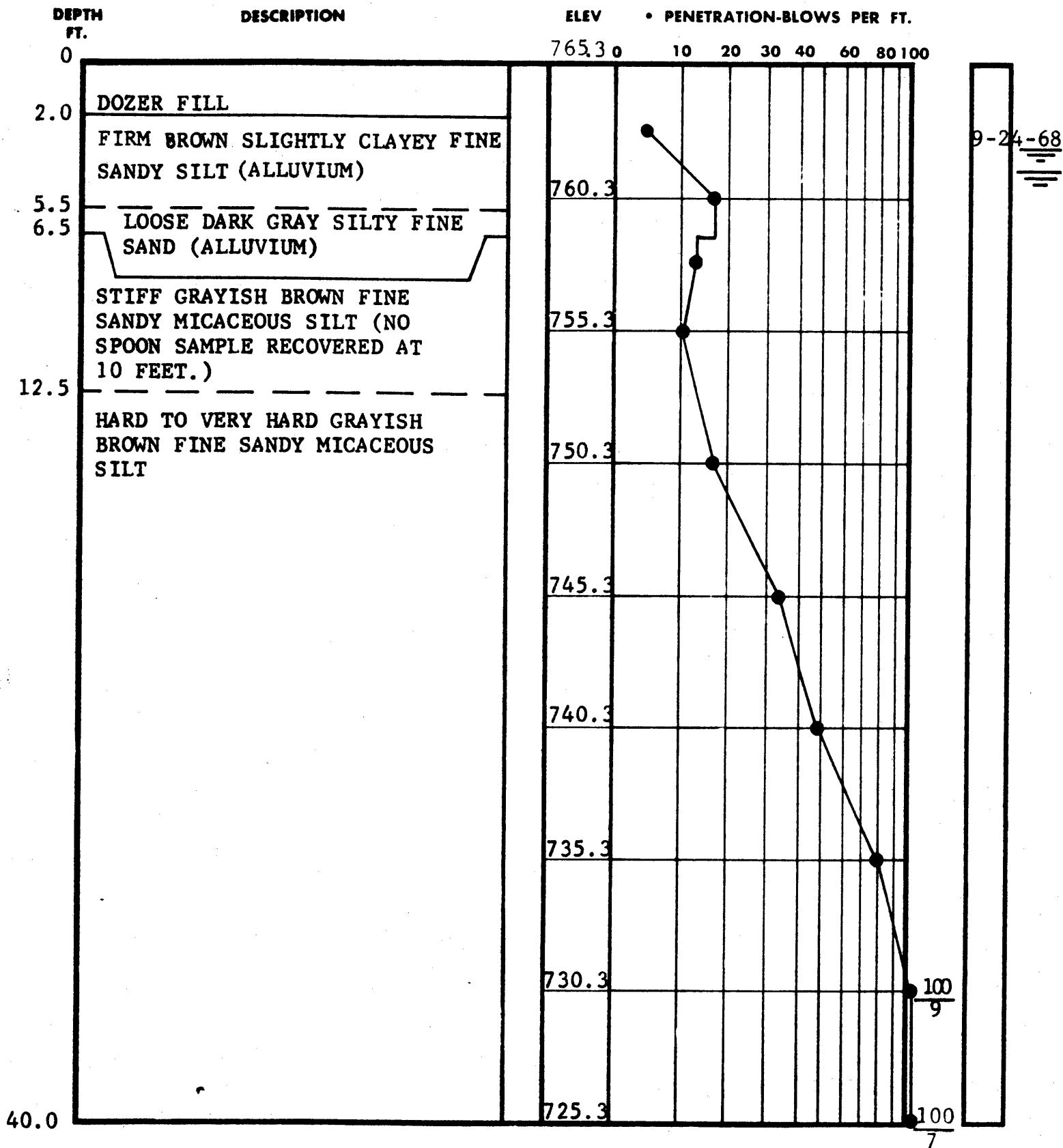
PAGE 2 of 2

[50] % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 of 3

BORING NO. B-119

DATE DRILLED 8-19-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



**LAW ENGINEERING TESTING CO.**



DEPTH FT.	DESCRIPTION	CORE BIT %	ELEV. SIZE	REMARKS
44.0	SOFT GRAYISH TAN SCHIST		721.3	
46.3	VERY SOFT GRAYISH TAN SCHIST	83		47.0'-49.0' FRACTURED AND NUMEROUS OPEN JOINTS DIPPING 60° AND NEARLY VERTICAL
47.0			716.3	49.0'-51.2' NUMEROUS FRACTURES, CLOSED AND OPEN JOINTS DIPPING 45°, 70° AND VERTICAL
51.2	MODERATELY HARD GRAY SCHIST	94		
53.5	SOFT GRAYISH TAN SCHIST		NX 711.3	54.8'-55.2' CLOSED INTERSECTING JOINTS DIPPING 70° AND 50°
55.4	MODERATELY HARD GRAY SCHIST	100		55.4'-56.5' HIGHLY FRACTURED, OPEN VERTICAL JOINT
55.9	SOFT GRAYISH TAN *1			56.5'-56.7' STAINED JOINT DIPPING 70°
59.9	SOFT AND MODERATELY HARD GRAYISH TAN SCHIST	98	706.3	58.3'-59.5' HIGHLY FRACTURED
62.0	MODERATELY HARD GRAY SCHIST			59.6'-59.8' CLOSED JOINT DIPPING 75°
		45	701.3	61.5'-66.5' VERY BROKEN (PIECES MOSTLY LESS THAN 1", SOME 3" IN LENGTH)
		63	BX 696.3	66.5'-71.5' FRACTURED AND BROKEN (PIECES 6"-1 1/2" IN LENGTH)
71.5	HARD GRAY SCHIST			71.5'-76.5' BROKEN (PIECES 4"-1" IN LENGTH)
		86	691.3	
76.5	CORING TERMINATED		686.3	

NO DRILLING WATER LOSS RECORDED  
\*1 SCHIST

## CORE BORING RECORD

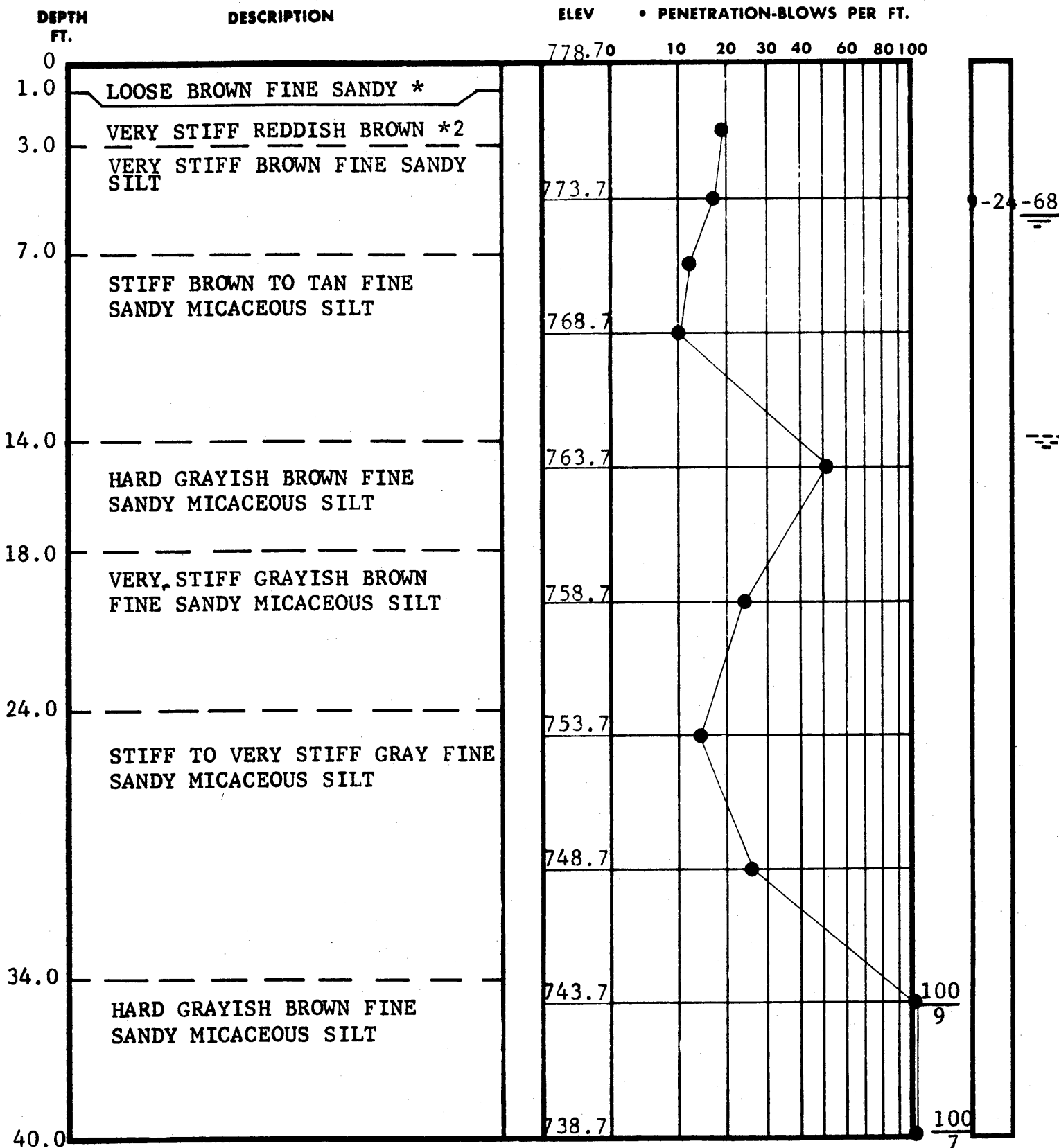
PAGE 3 OF 3

BORING NO. 119  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.





\* MICACEOUS SILT (DOZER FILL)

\*2 SLIGHTLY CLAYEY FINE SANDY SILT WITH SOME GRAVEL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 3

BORING NO. B-120

DATE DRILLED 8-22-68

JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

50% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



[illegible]

## TEST BORING RECORD

**BORING AND SAMPLING MEETS ASTM D-1586**  
**CORE DRILLING MEETS ASTM D-2113**

**PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.**

PAGE 2 OF 3

**BORING NO. B-120**

DATE DRILLED 8-22-68

**JOB NO.** 5862

**UNDISTURBED SAMPLE**

**WATER TABLE, 24 HR.**

**WATER TABLE, 1 HR.**

**[50] % ROCK CORE RECOVERY**

### LOSS OF DRILLING WATER

**LAW ENGINEERING TESTING CO.**



DEPTH FT.	DESCRIPTION	CORE BIT %	ELEV. SIZE	REMARKS
51.5	MODERATELY HARD GRAY SCHIST			51.5'-56.5' ROCK IS
52.2	HARD GRAY SCHIST	85		BROKEN AND FRACTURED
54.2	MODERATELY HARD GRAY			(PIECES 3"-6" IN
54.9	SCHIST		722.2	LENGTH)
57.7	HARD GRAY SCHIST			56.5'-57.9' ROCK IS
57.9	MODERATELY HARD GRAY SCHIST	93		CONTINUOUS
				57.9'-59.6' FRACTURED
				AND BROKEN (PIECES
				6"-8" IN LENGTH)
			717.2	59.2'-59.6' STAINED
				VERTICAL JOINT
		BX		DIPPING 75°
	HARD GRAY SCHIST	87		59.6'-61.5' FRACTURED
				(PIECES 1"-3" IN
				LENGTH)
			712.2	64.3'-64.5' CLOSED
				VERTICAL JOINT
		100		DIPPING 70°
				62.5'-62.9' TWO
				STAINED FRACTURES
			707.2	66.5'-67.2' HIGHLY
71.5				FRACTURED
	CORING TERMINATED			67.8'-69.6' FRACTURED
				(PIECES 6"-1" IN
				LENGTH)
				68.5'-69.6' TWO STAINED
				JOINTS, ONE NEARLY
				VERTICAL AND ONE
				DIPPING 70°
				70.1'-73.4' BROKEN
				71.9'-72.2' CLOSED
				JOINT DIPPING 60°

NO DRILLING WATER LOSSES RECORDED

## CORE BORING RECORD

PAGE 3 OF 3

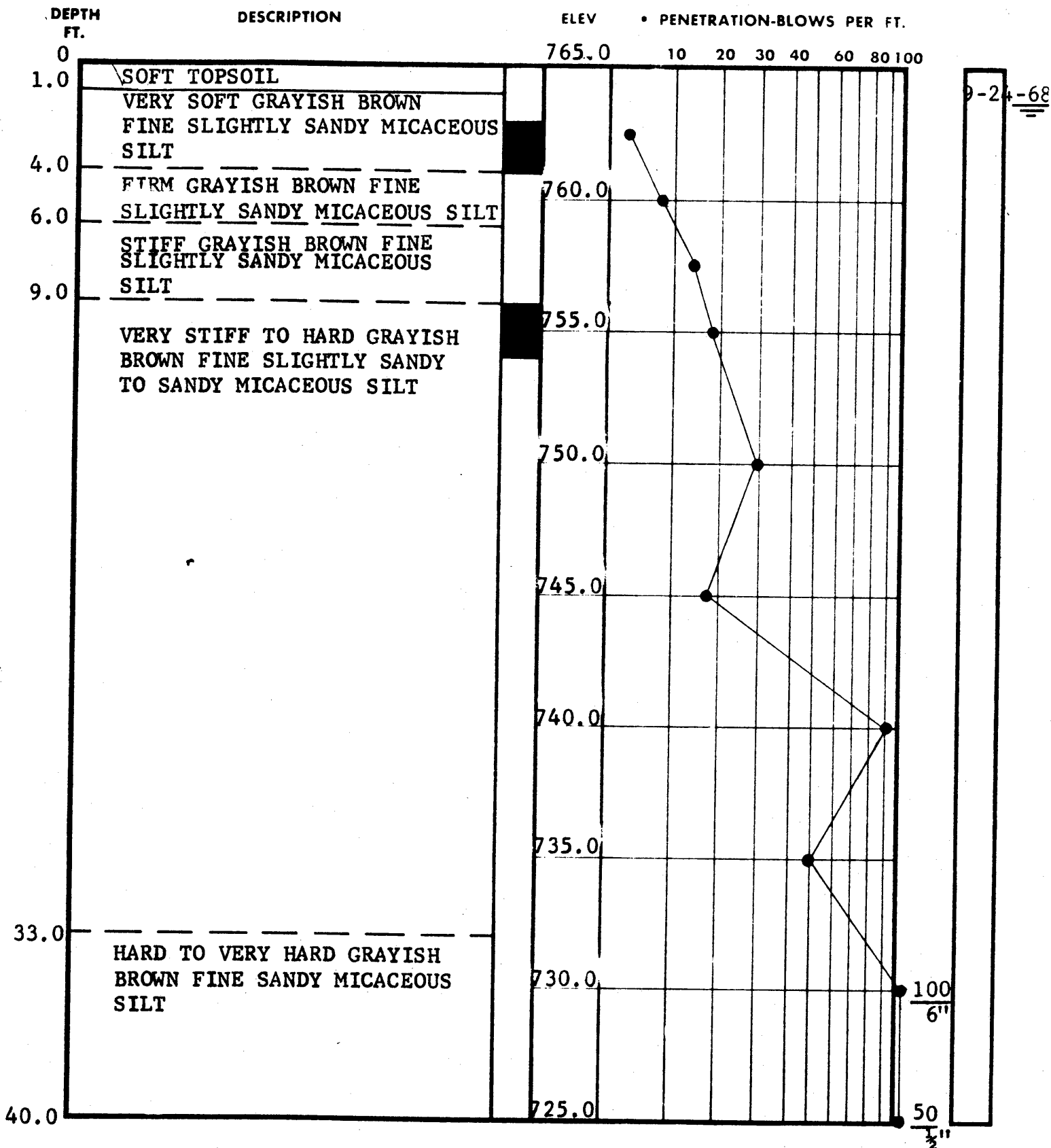
BORING NO. 120  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 of 3

BORING NO. B-121

DATE DRILLED 8-6-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.











DEPTH ET	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
57.5			707.5	
	SOFT AND MODERATELY HARD GRAYISH TAN SCHIST	62		57.5'-62.5' FRACTURED CLOSED VERTICAL JOINT
62.5			702.5	
	MODERATELY HARD GRAYISH*1			62.5'-67.5' FRACTURED (PIECES 3"-1" IN LENGTH)
64.0	SOFT GRAYISH TAN SCHIST	100		62.6'-62.8' INTER- SECTING STAINED JOINTS, DIPPING 60° AND ONE VERTICAL
66.0	MODERATELY HARD GRAYISH TAN SCHIST		697.5	63.3'-63.9' TWO CLOSED VERTICAL JOINTS WITH TWO INTERSECTING CLOSED JOINTS DIPPING 45°
70.4		93		
70.6	SOFT GRAYISH TAN *2			
	MODERATELY HARD GRAYISH TAN SCHIST		692.5	66.0'-66.5' CLOSED INTERSECTING JOINTS, DIPPING 80° AND 40°
75.0			NX	
75.6	SOFT GRAY SCHIST	100		67.5'-72.5' FRACTURED (PIECES 1"-6" IN LENGTH)
			687.5	
				68.4'-68.7' CLOSED VERTICAL JOINT
	MODERATELY HARD GRAY SCHIST	73		69.1'-69.3' STAINED VERTICAL JOINT
			682.5	
				70.2'-70.4' CLOSED VERTICAL JOINT
		76		71.2'-72.5' THREE CLOSED JOINTS, DIPPING 60°, 50° AND VERTICAL
			677.5	
		97		72.5'-73.1' TWO VERTICAL CLOSED JOINTS
			BX	
		93		72.9'-STAINED FRACTURE
93.0	HARD GRAY SCHIST		672.5	73.1'-74.3' FRACTURED (PIECES 1"-6" IN LENGTH)
97.5		100	667.5	

\*1 TAN SCHIST

\*2 SCHIST



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
97.5	HARD GRAY SCHIST		667.5	74.1'-74.3'TWO STAINED JOINTS, DIPPING 40° AND VERTICAL
	VERY SOFT GRAYISH- TAN SCHIST			75.6'-75.9'CLOSED JOINT DIPPING 65°
	HARD GRAY SCHIST	100	BX 662.5	76.2'-76.4'FRACTURED AND SOFT SEAM
105.5	CORING TERMINATED		657.5	76.7'-77.2'TWO OPEN JOINTS DIPPING 40°
				77.5'-77.6'FRACTURE AND STAINED VERTICAL JOINT
				77.8'-78.2'INTERSECTING CLOSED JOINTS, DIPPING 60° AND 40°
				78.3'-79.4'STAINED FRACTURES (PIECES 4"- 5" IN LENGTH)
				79.4'-82.5'STAINED FRACTURES (PIECES 1"- 3" IN LENGTH)
				79.6'-80.5'TWO STAINED JOINTS DIPPING 50° AND 60°
				82.5'-85.2'FRACTURED (PIECES 2"-8" IN LENGTH)
				84.2'-85.2'TWO STAINED JOINTS DIPPING 50°AND 60°
				85.2'-87.5'HIGHLY FRACTURED

NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD



DEPTH  
FT.

DESCRIPTION

CORE BIT ELEV.  
% SIZE

REMARKS

			87.5'-90.5' FRACTURED AND JOINTED
			88.0'-88.3' CLOSED STAINED JOINT DIPPING 60°
			88.4'-88.9' TWO CLOSED JOINTS DIPPING 70°
			89.0'-89.5' CLOSED INTERSECTING JOINTS DIPPING 60° AND 70°
			90.8'-90.9' OPEN JOINT DIPPING 45°
			91.4'-92.4' FRACTURED AND BROKEN (PIECES ABOUT 1" IN LENGTH)
			92.4'-95.5' FRACTURED AND BROKEN (PIECES 3"-6" IN LENGTH)
			93.0'-93.4' STAINED VERTICAL JOINT
			95.0'-95.2' OPEN JOINT DIPPING 60°
			95.5'-100.5' FRACTURED AND BROKEN (PIECES 1"-6" IN LENGTH)
			95.5'-96.0' CLOSED VERTICAL JOINT
			96.0'-96.3' OPEN JOINT DIPPING 50°
			97.0'-98.0' TWO VERTICAL CLOSED JOINTS AND ONE CLOSED JOINT DIPPING 80°
			98.3'-99.1' THREE CLOSED STAINED JOINTS DIPPING 75° AND ONE INTERSECTING JOINT DIPPING 60°
			100.5'-102.2' FRAC- TURED AND BROKEN
			101.2'-102.2' FOUR STAINED JOINTS. *

\*VERTICAL, DIPPING 60°  
80°, AND 45°

# CORE BORING RECORD

PAGE 3 OF 4 BORING NO. 121-A  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.



DEPTH  
FT.

DESCRIPTION

CORE BIT  
% SIZE ELEV.

REMARKS

				102.2'-105.5'
				BROKEN (PIECES 6" -
				8" IN LENGTH)

CORE BORING RECORD

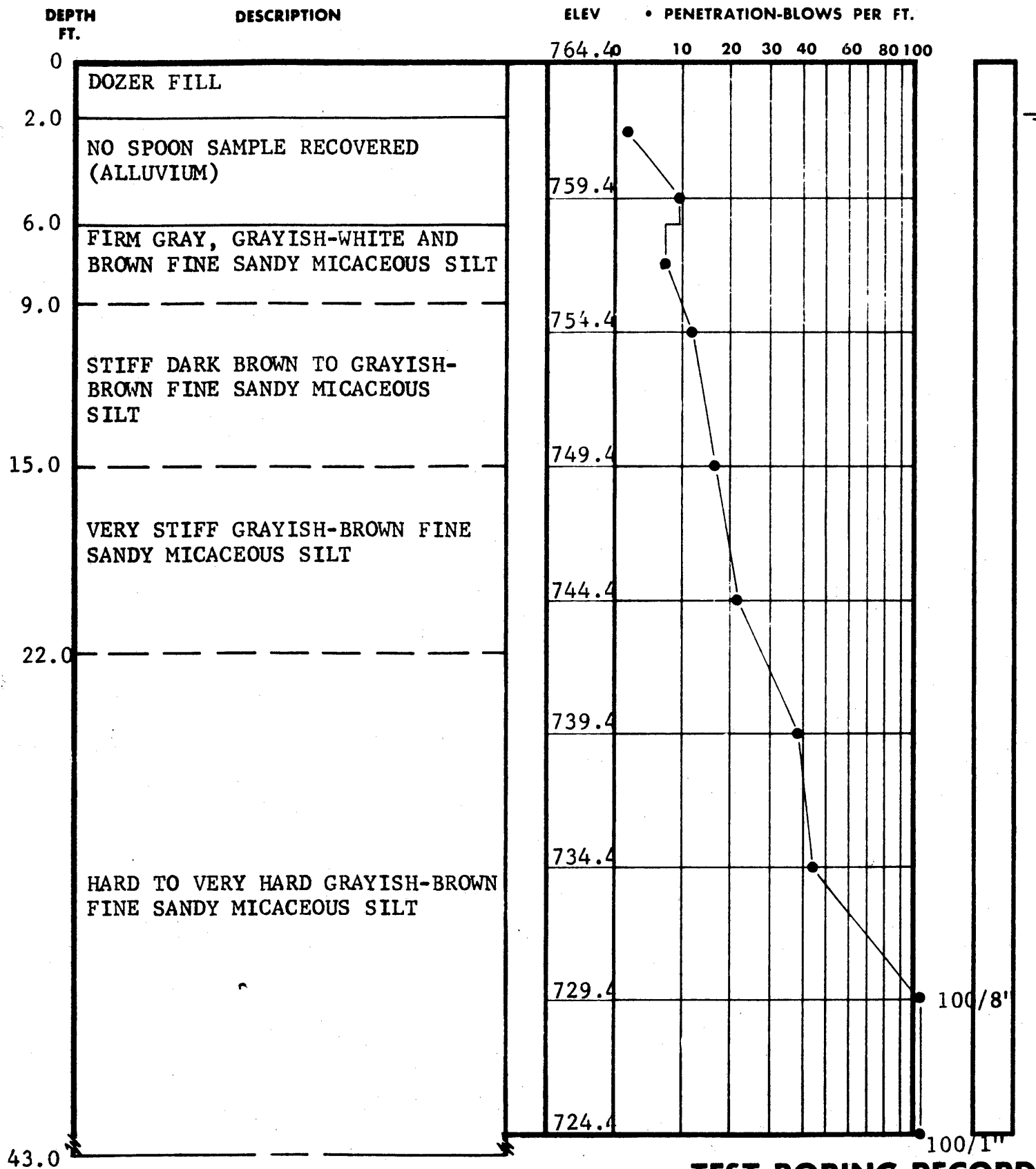
PAGE 4 OF 4

BORING NO. 121A  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-122

DATE DRILLED 8/19/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

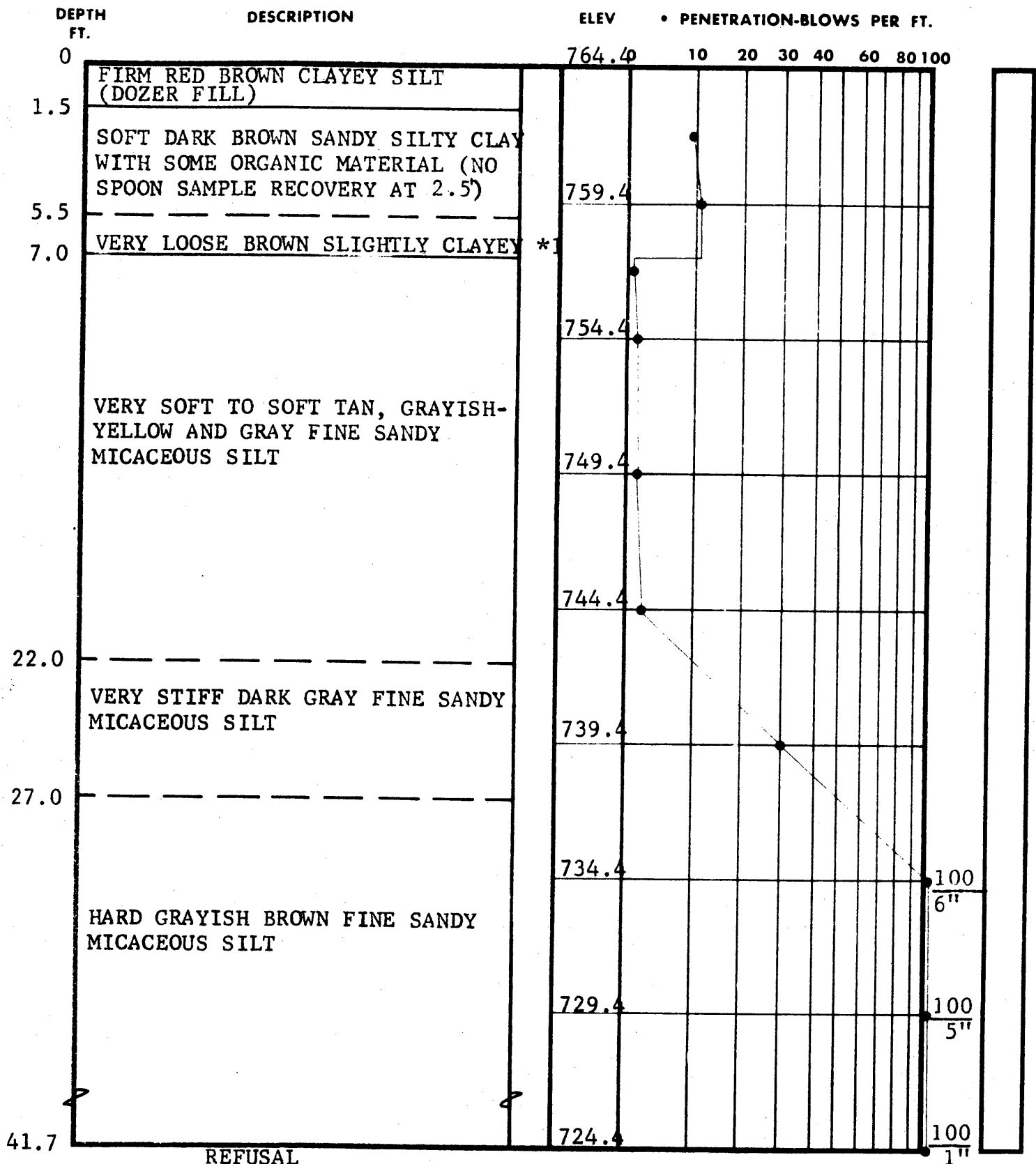
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





SEE CORE BORING RECORD

\*1 SILTY FINE TO COARSE SAND WITH SOME GRAVEL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

(ALLUVIUM) PAGE 1 OF 2

BORING NO. B-123

DATE DRILLED 8/14/68

JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

50% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV. 722.7	REMARKS
41.7	MODERATELY HARD GRAYISH TAN SCHIST			41.9'-42.1'SOFT AND HIGHLY FRACTURED
42.5				(PIECES LESS THAN 1/2" IN LENGTH)
43.0	SOFT TO VERY SOFT GRAYISH TAN SCHIST	100		43.0'-46.7'NUMEROUS CLOSED JOINTS DIPPING 45°
	MODERATELY HARD GRAYISH TAN SCHIST WITH SOFT SEAMS		717.7	
46.7				49.2'-50.3'SOFT AND FRACTURED
	HARD GRAY SCHIST	88	712.7	54.0'SOFT AND FRAC- TURED
		100		
			NX	
			707.7	
57.0	SOFT AND MODERATELY HARD GRAYISH TAN *1			
57.6				
	HARD GRAY SCHIST	82	702.7	61.7'-64.7'CONTINUOUS 64.7'-64.9'FRACTURED
				65.3'-65.9'CLOSED JOINT DIPPING 75°
64.7		100		66.1'-66.7'FRACTURED AND JOINTED
64.9	MODERATELY HARD *2			66.8'-66.9'CLOSED VERTICAL JOINT
66.1	HARD GRAY SCHIST		697.7	67.3'-67.6'CLOSED VERTICAL JOINT
66.7	SOFT GRAY SCHIST			69.2'-70.2'FRACTURED (PIECES 1"-4" IN LENGTH)
	HARD GRAY SCHIST	100		70.8'-71.3'FRACTURED CLOSED JOINT DIPPING 45°
71.7			692.7	
	CORING TERMINATED			

\*1 SCHIST

\*2 GRAY SCHIST

NO DRILLING WATER LOSS RECORDED

PAGE 2 of 2

# CORE BORING RECORD

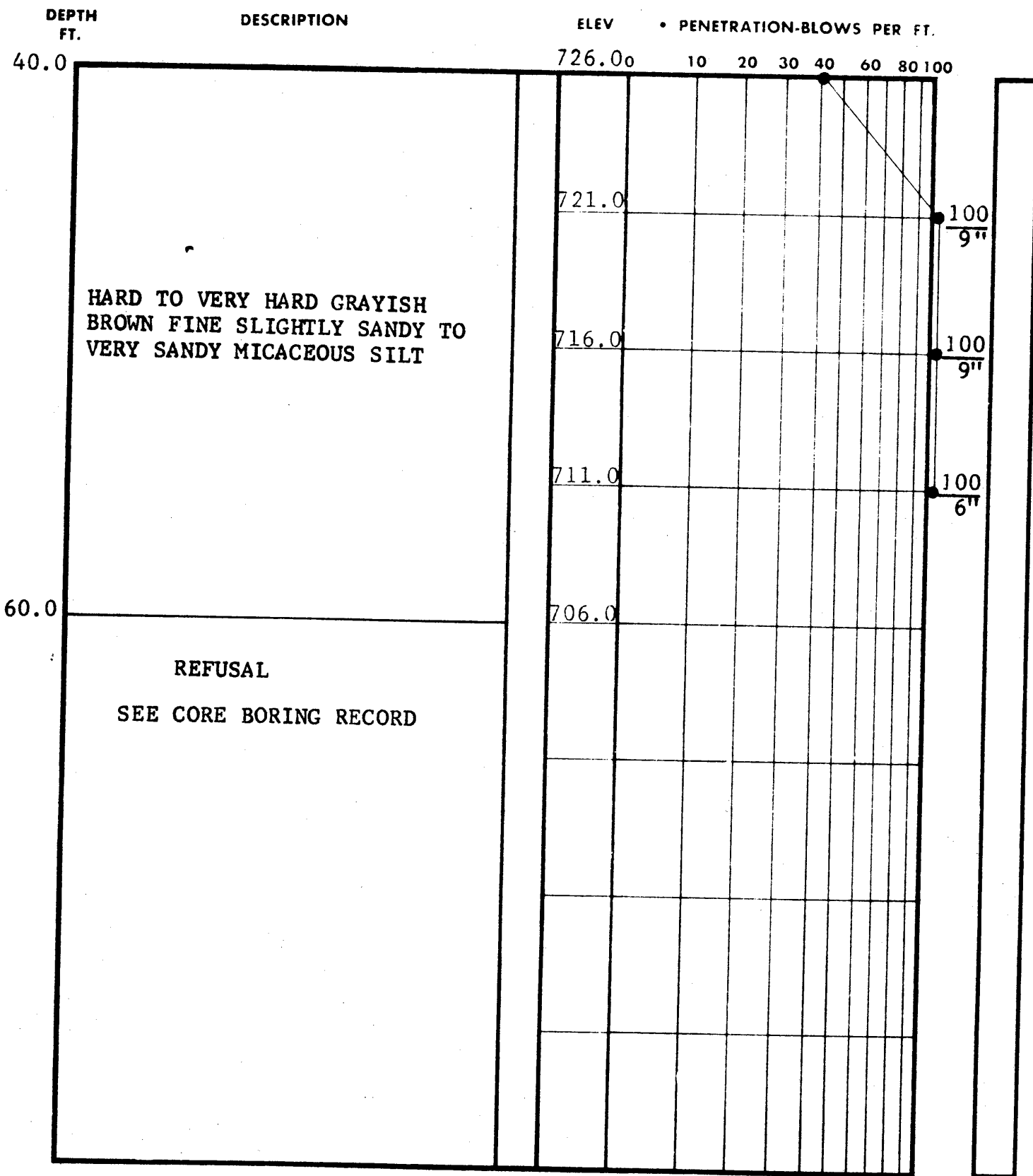
BORING NO. 123  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO.





# TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113  
 PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 OF 3

BORING NO. B-124  
 DATE DRILLED 8-9-68  
 JOB NO. 5862

 UNDISTURBED SAMPLE

 50% ROCK CORE RECOVERY

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER



DEPTH FT.	DESCRIPTION	CORE BIT %	ELEV. SIZE	REMARKS
60.0	SOFT GRAYISH-TAN SCHIST	45	706.0	60.5'-65.0' FRACTURED AND BROKEN (PIECES LESS THAN 3" IN LENGTH) OPEN JOINT DIPPING 45°
65.0	MODERATELY HARD GRAY SCHIST	96	701.0	65.1'-65.3' CLOSED JOINT DIPPING 50°
66.2		90	696.0	65.5'-65.7' CLOSED JOINT DIPPING 45° 66.2'-66.4' AND 66.9'-67.0' TWO CLOSED JOINTS DIPPING 80°
	HARD GRAY SCHIST	NX	691.0	67.3'-70.0' FRACTURED (PIECES 2"-10" IN LENGTH)
		98		69.1'-69.4' OPEN JOINT DIPPING 50°
		96	686.0	70.0'-70.2' FRACTURED 70.2'-70.5' CLOSED JOINT DIPPING 60°
83.5	MODERATELY HARD GRAY SCHIST WITH SOFT SEAMS		681.0	71.4'-OPEN FRACTURE 72.7'-73.1' OPEN JOINT DIPPING 50° 73.4'-OPEN FRACTURE
84.5		95		74.3'-74.6' CLOSED JOINT DIPPING 40°
	HARD GRAY SCHIST		676.0	80.8'-81.4' THREE VERTICAL JOINTS, TWO CLOSED AND ONE OPEN
90.0	CORING TERMINATED			83.5'-84.5' HIGHLY FRACTURED, JOINTED AND BROKEN (PIECES LESS THAN 1" IN LENGTH) 85.4' OPEN FRACTURE 88.4'-88.6' SOFT SEAM 89.8'-90.0' OPEN JOINT DIPPING 45°

NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD

PAGE 3 OF 3

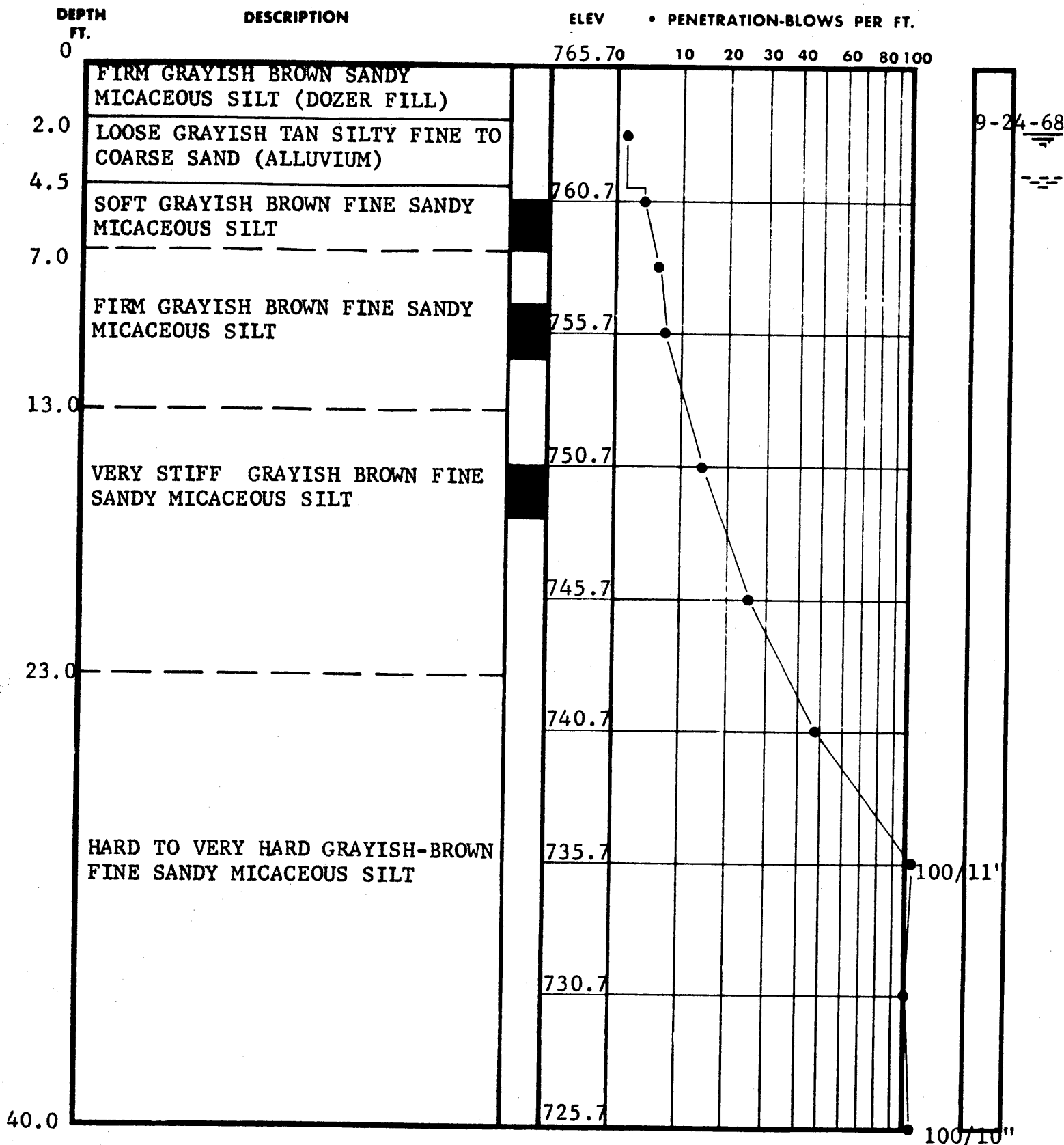
BORING NO. 124  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 of 2

BORING NO. B-125

DATE DRILLED 8/7/68

JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH  
FT.

DESCRIPTION

ELEV • PENETRATION-BLOWS PER FT.

DEPTH FT.	DESCRIPTION	ELEV	10	20	30	40	60	80	100	PENETRATION-BLOWS PER FT.
0		725.7								100/10"
		720.7								100/11"
		715.7								100/1"
		710.7								100/5"
		705.7								100/3"
		700.7								100/3"
		695.7								100/1"
74.0	REFUSAL	690.7								

HARD TO VERY HARD GRAYISH-BROWN  
FINE SANDY MICACEOUS SILT

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 of 2

BORING NO. B-125

DATE DRILLED 8/7/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

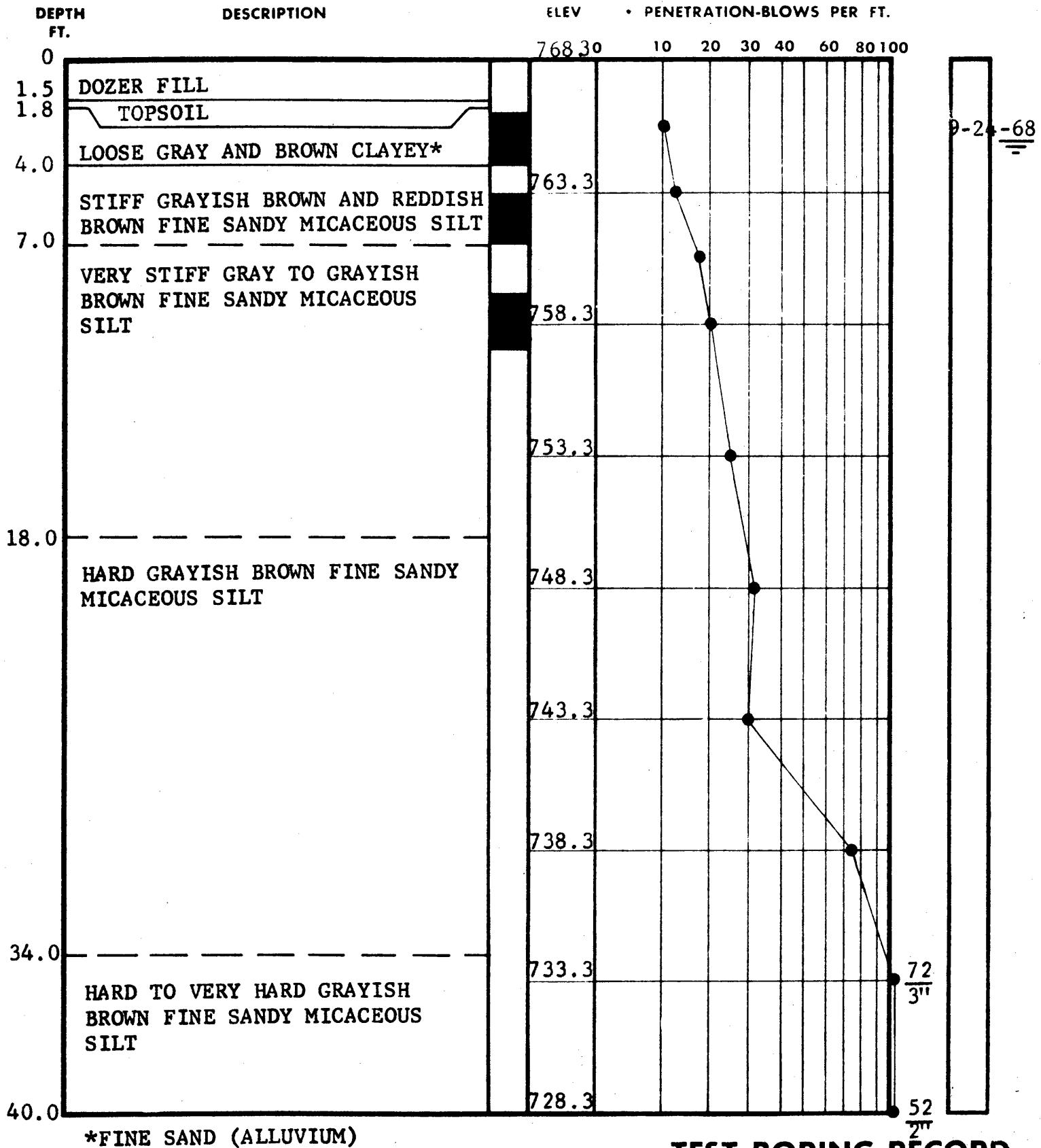
 WATER TABLE, 1 HR.

 50% ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 of 3

BORING NO. B-126

DATE DRILLED 8-6-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 50% ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT.									
40.0		728.30	10	20	30	40	60	80	100	52	2"	
		723.3								100	5 1/2"	
		718.3								100	5"	
		713.3								100	2"	
57.0										100	NP	
	HARD TO VERY HARD GRAYISH BROWN FINE SANDY MICACEOUS SILT											
	REFUSAL SEE CORE BORING RECORD	708.3										

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 OF 3

BORING NO. B-126

DATE DRILLED 8-6-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
57.0	VERY SOFT, SOFT AND MODERATELY HARD GRAYISH TAN SCHIST	55	711.3	57.0'-62.0' HIGHLY FRACTURED AND BROKEN WITH STAINED JOINTS AND FRACTURES
			706.3	62.0'-67.0' HIGHLY FRACTURED AND BROKEN, PIECES SHOW NUMEROUS STAINED FRACTURES AND JOINTS, SOME INTER- SECTING NEARLY VER- TICAL JOINTS
		75	701.3	67.0'-72.0' HIGHLY FRACTURED AND BROKEN
		35		72.0'-77.0' HIGHLY FRACTURED AND BROKEN, SOME STAINED JOINTS AND FRACTURES
			696.3	77.0'-82.0' HIGHLY FRACTURED, SOME STAINED JOINTS AND FRACTURES (PIECES 4" TO LESS THAN 1" IN LENGTH)
		70	691.3	
		50	686.3	
		57	681.3	
87.0	CORING TERMINATED			

NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD

PAGE 3 OF 3

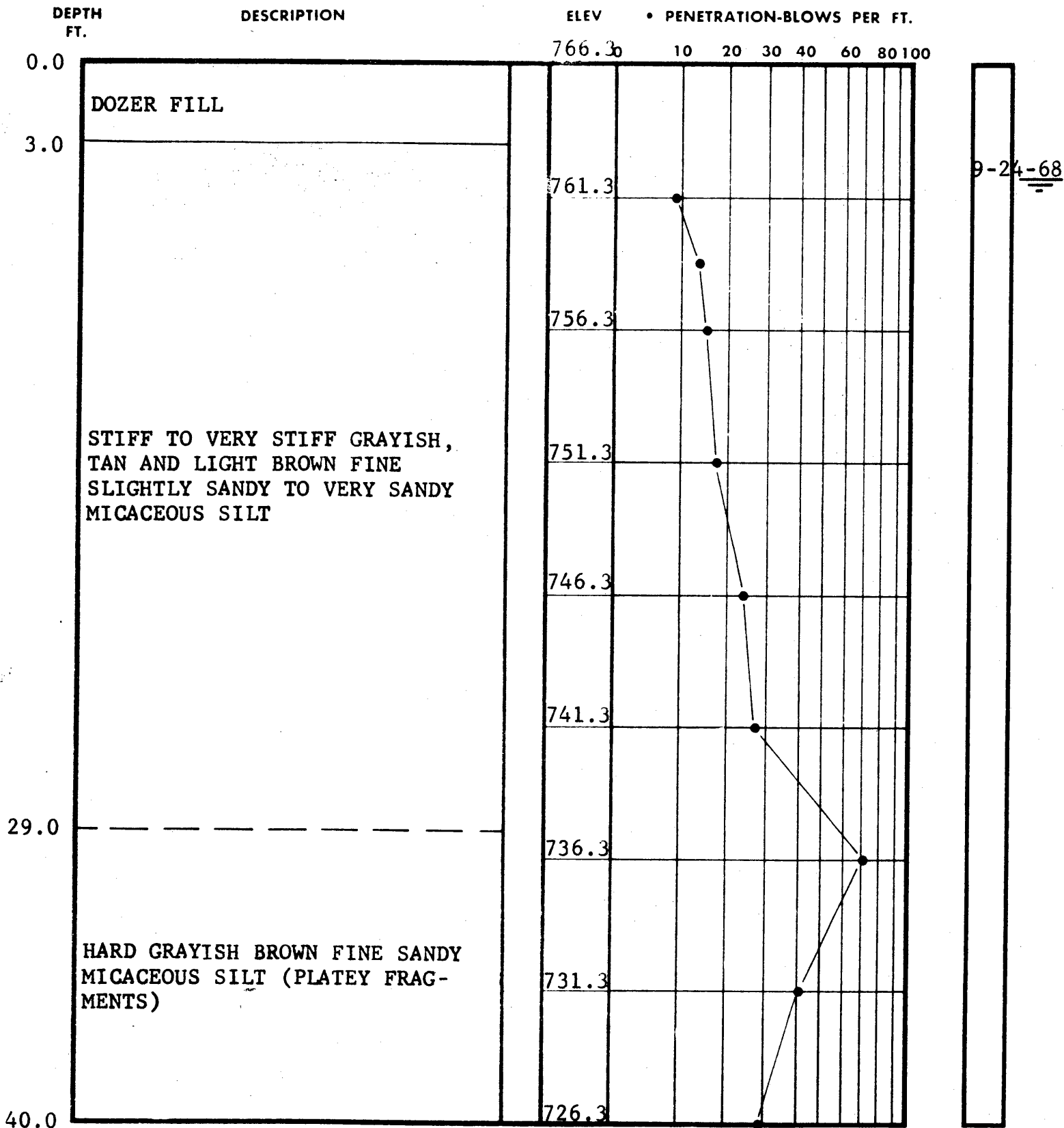
BORING NO. 126  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 3

BORING NO. B-127

DATE DRILLED 8-13-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



• PENETRATION-BLOWS PER FT.

VERY DENSE LIGHT BROWN SILTY  
FINE TO MEDIUM SAND (NO SPOON  
SAMPLE RECOVERED AT 50.0 FEET)

REFUSAL  
SEE CORE BORING RECORD

726.30

10 20 30 40 60 80 100

721.3

$$\frac{100}{4''}$$

716.3

$$\frac{100}{1''}$$

## TEST BORING RECORD

Page 2 of 3

BORING NO. B-127

DATE DRILLED 8-13-68

JOB NO. 5862

sn  
abc

### UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

**WATER TABLE, 1 HR.**

50 % ROCK CORE RECOVERY

### LOSS OF DRILLING WATER

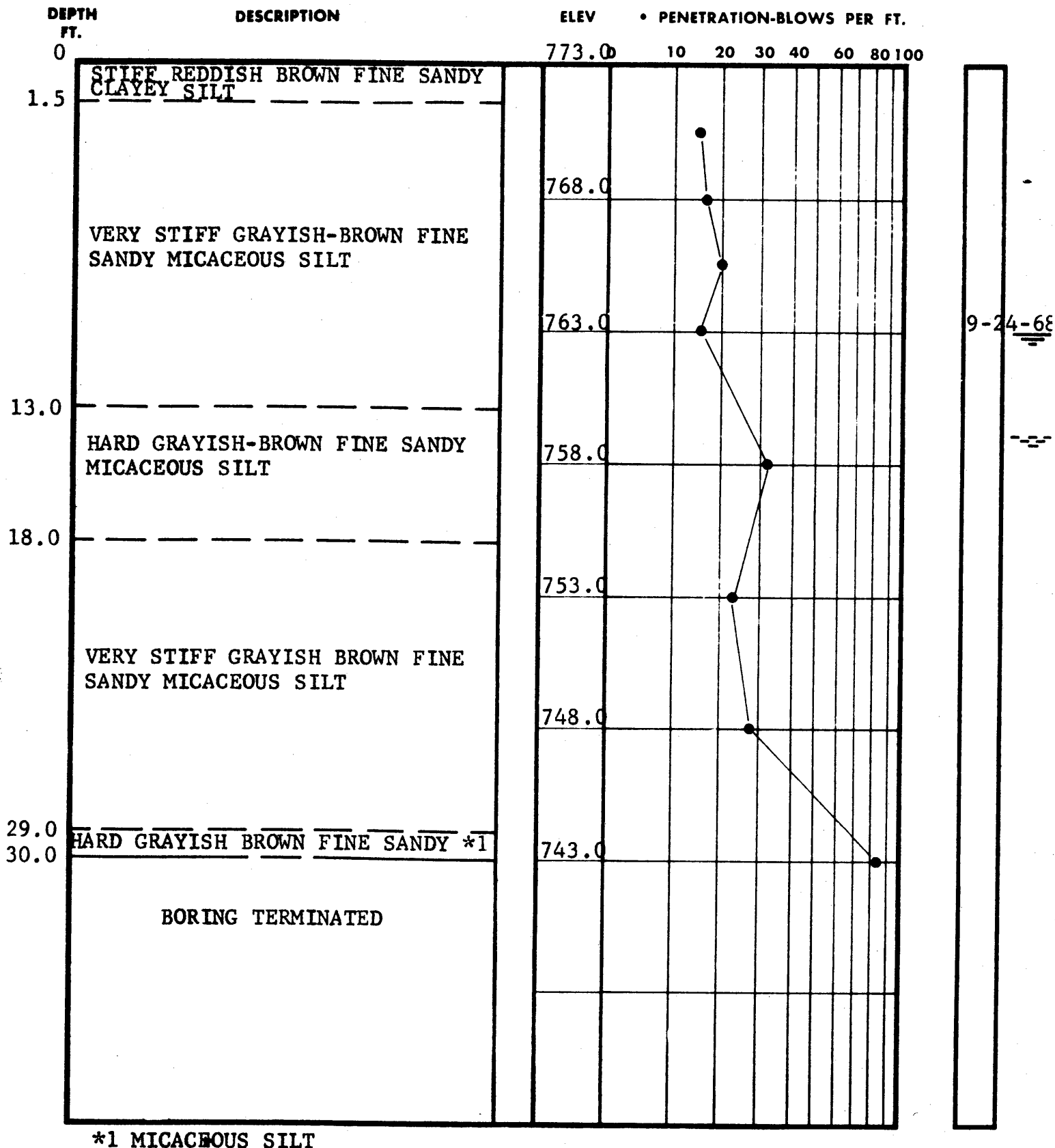
**LAW ENGINEERING TESTING CO.**



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
50.0	VERY SOFT GRAY BROWN SCHIST	73	716.3	50.0' - 52.2' ROCK IS FRACTURED AND THINLY FOLIATED; ALSO, SEVERAL STAINED FRACTURED FOLIATION PLANES AND STAINED JOINTS DIPPING ABOUT 80°
52.2	MODERATELY HARD GRAY SCHIST			
53.2	MODERATELY HARD DARK GRAY SCHIST WITH OCCASIONAL THIN SOFT SEAMS	25	711.3	52.2' - 53.2' TWO INTERSECTING OPEN STAINED JOINTS, ONE NEARLY VERTICAL AND ONE DIPPING ABOUT 80°
			706.3	
		51	NX 701.3	53.2' - 65.0' HIGHLY FRACTURED (PIECES UP TO 1" IN LENGTH)
		90		61.0' - 65.0' (CLOSED JOINT DIPPING 80°, OPEN STAINED JOINT DIPPING 80°)
		94	696.3	
			691.3	68.0' - 68.3' OPEN STAINED JOINT DIPPING 45°
		97		68.8' - 68.9' OPEN STAINED JOINT DIPPING 40°
80.0	CORING TERMINATED		686.3	

# CORE BORING RECORD









\*1 MICACEOUS SILT

## TEST BORING RECORD

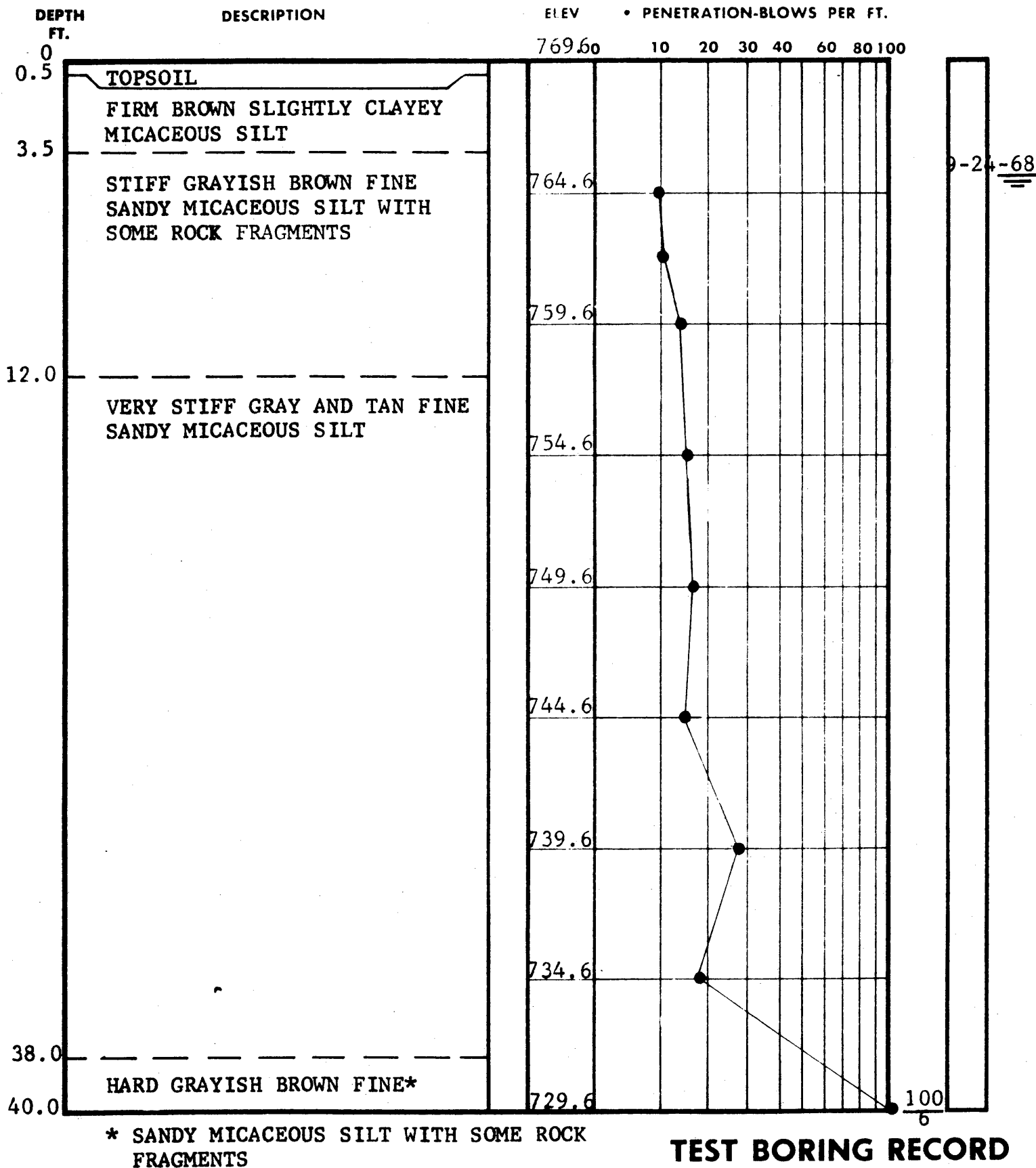
BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-128  
DATE DRILLED 8/6/68  
JOB NO. 5862

jj  UNDISTURBED SAMPLE  
 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
[50] % ROCK CORE RECOVERY  LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\* SANDY MICACEOUS SILT WITH SOME ROCK FRAGMENTS

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 3

BORING NO. B-129

DATE DRILLED 8-19-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	ELEV • PENETRATION-BLOWS PER FT.									
		729.60	10	20	30	40	60	80	100	100	
40.0	HARD GRAYISH BROWN FINE SANDY MICACEOUS SILT WITH SOME ROCK FRAGMENTS									100	6"
		724.6								100	12"
		719.6								50	1"
		714.6								50	1/2"
59.5	REFUSAL  SEE CORE BORING RECORD	709.6									

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 OF 3

BORING NO. B-129

DATE DRILLED 8-19-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH  
FT.  
59.5

DESCRIPTION

CORE BIT ELEV.  
% SIZE 710.1

REMARKS

59.5	MODERATELY HARD GRAYISH TAN SCHIST	100		705.1	59.5'-64.5' FRACTURED AND BROKEN (PIECES 1"-6" IN LENGTH) 59.5'-60.3' NUMEROUS CLOSED JOINTS DIPPING 80°
		100		700.1	60.3' OPEN FRACTURE 61.5'-62.2' OPEN STAINED JOINT DIPPING 80°
		97	BX	695.1	64.5'-69.6' FRACTURED AND BROKEN (PIECES 1"-10" IN LENGTH) 65.4'-66.6' OPEN FRACTURE
		100		690.1	67.9'-68.2' INTER- SECTING OPEN JOINTS, BOTH DIPPING 50° 68.3'-68.5' OPEN JOINT DIPPING 50°
79.5	CORING TERMINATED				69.5'-74.5' FRACTURED AND BROKEN 70.2'-70.8' OPEN STAINED JOINT DIPPING 80° AND HIGHLY FRAC- TURED 71.6'-OPEN FRACTURE 72.7'-73.8' CLOSED JOINT DIPPING 80° 74.5'-78.2' SLIGHTLY FRACTURED AND BROKEN (PIECES 2"-8" IN LENGTH) 78.2'-78.9' HIGHLY FRACTURED

NO DRILLING WATER LOSS RECORDED

CORE BORING RECORD

PAGE 3 OF 3

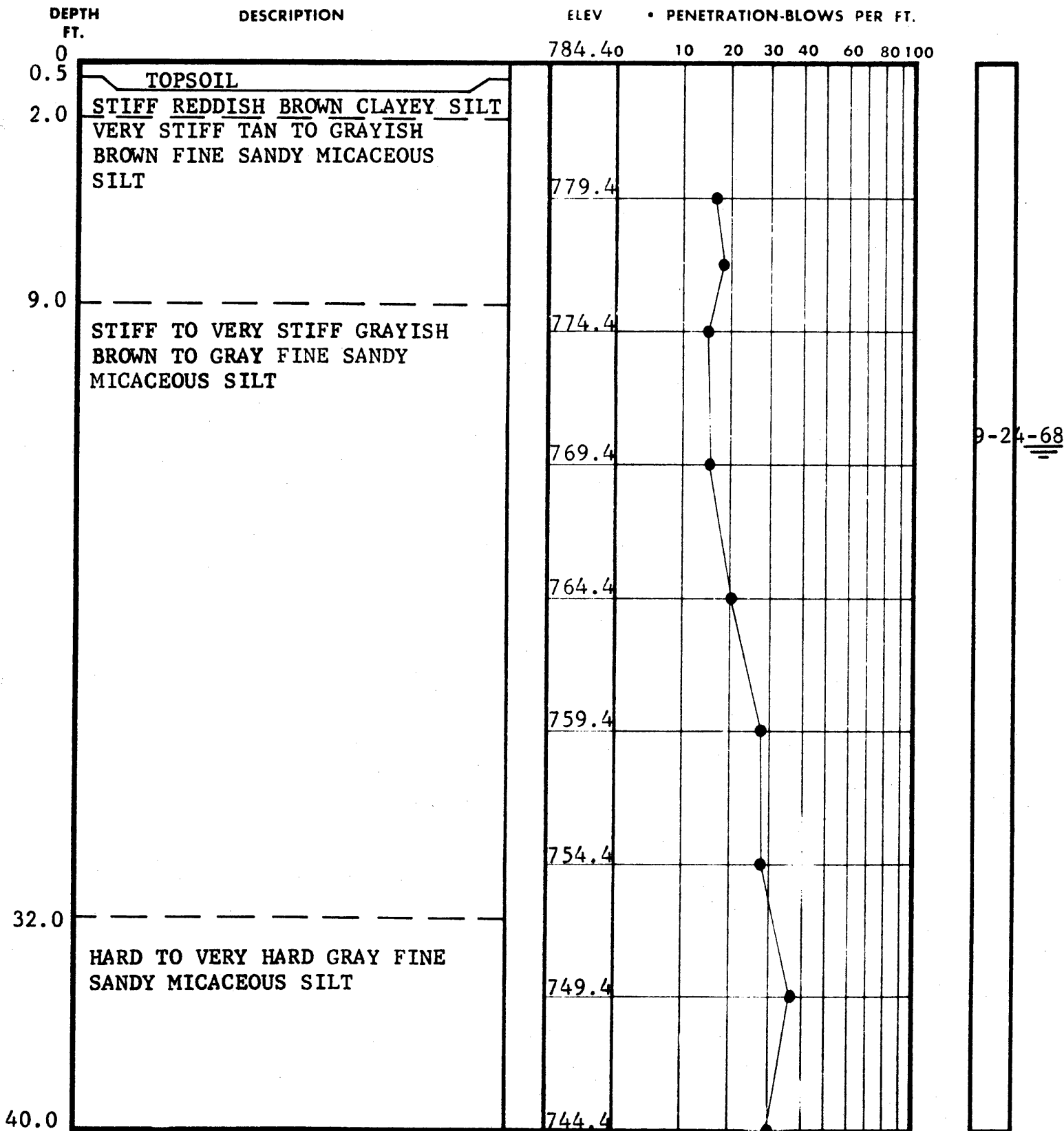
BORING NO. 129  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 3

BORING NO. B-131

DATE DRILLED 8-21-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

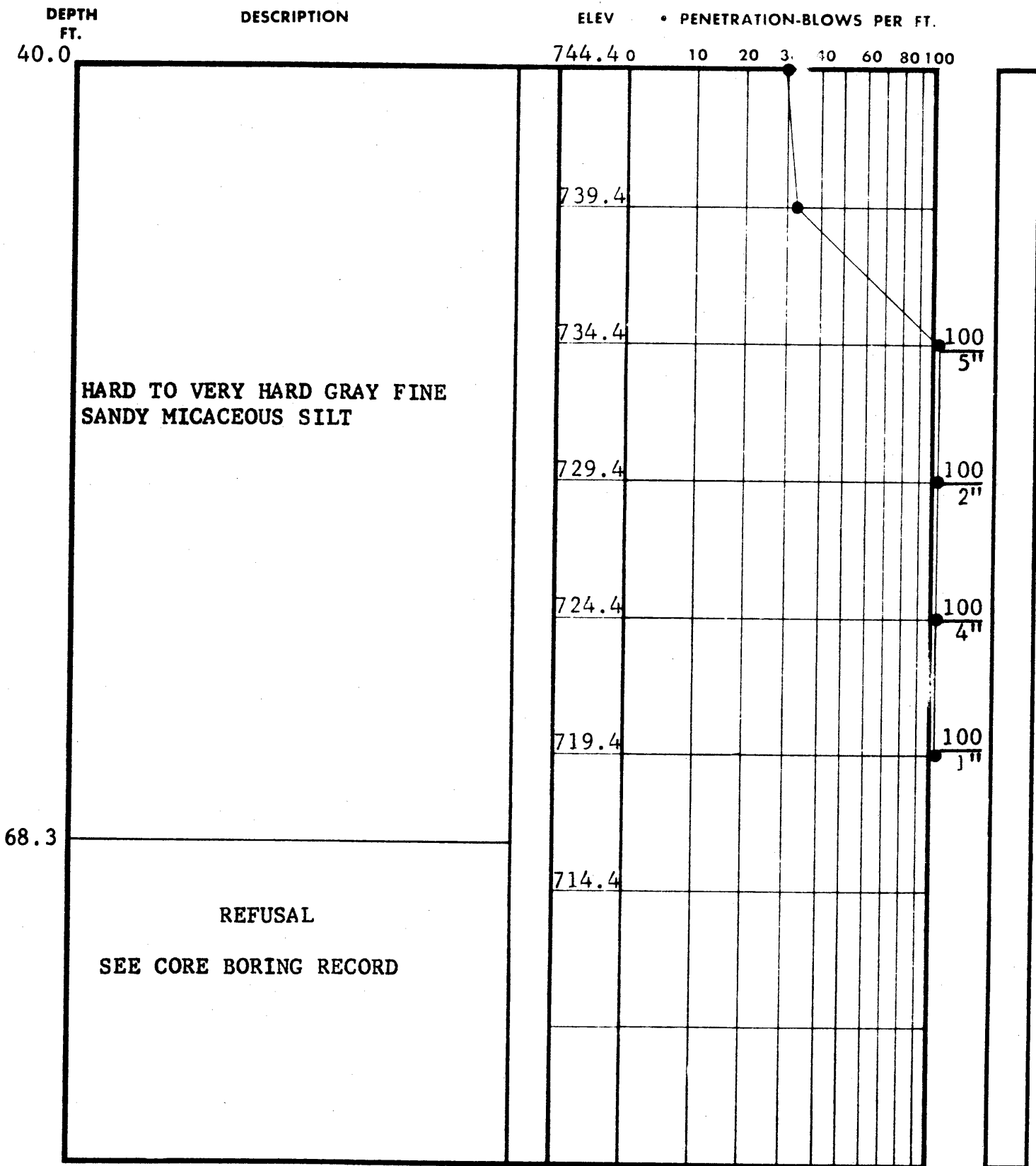
 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113  
 PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 OF 3

BORING NO. B-131  
 DATE DRILLED 8-21-68  
 JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT %	ELEV. SIZE	REMARKS
68.3	MODERATELY HARD GRAY SCHIST	98	716.1	68.3'-73.3'SLIGHTLY FRACTURED
			711.1	68.7'-68.8'TWO STAINED FRACTURES
	HARD GRAY SCHIST	98	706.1	69.6'CLOSED STAINED FRACTURE
78.3		93	701.1	72.2'-72.4' AND 73.0'-73.3'SOFT SEAM
		98	696.1	73.3'-78.3'BROKEN (PIECES 3"-6" IN LENGTH)
88.3	CORING TERMINATED			75.3'-75.7'CLOSED JOINT DIPPING 80°
				76.6'-76.7'SOFTER AND HIGHLY FRACTURED
				77.6'-78.0'CLOSED STAINED JOINT DIPPING 60°
				78.0'-78.3'HIGHLY FRACTURED
				78.7'-STAINED FRACTURE
				79.4'-80.0'TWO CLOSED JOINTS DIPPING 80° AND 50°
				80.0'-80.5'CLOSED JOINT DIPPING 80°
				80.7'-81.7'HIGHLY FRACTURED, STAINED VERTICAL JOINT
				81.7'-81.9'NUMEROUS JOINTS DIPPING 70°
				84.4'-85.1'STAINED OPEN JOINT DIPPING 75°

NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD

PAGE 3 OF 3

BORING NO. 131  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.



• PENETRATION-BLOWS PER FT.

0 789.10 10 20 30 40 60 80 100

VERY STIFF LIGHT REDDISH-BROWN  
FINE SANDY SILT

4.0

784.1

VERY STIFF GRAYISH-TAN TO GRAY  
FINE SANDY MICACEOUS SILT

779.1

774.1

769.1

24.0

764.1

HARD GRAYISH-BROWN AND GRAY  
FINE SANDY MICACEOUS SILT

759.1

754.1

38.0

HARD TO VERY HARD GRAY FINE  
SANDY MICACEOUS SILT

749.1

40.0

100/2

# TEST BORING RECORD

**BORING AND SAMPLING MEETS ASTM D-1586**  
**CORE DRILLING MEETS ASTM D-2113**

**PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.**

BORING NO. B-132

DATE DRILLED 8/26/68

JOB NO. 5862

### UNDISTURBED SAMPLE

**WATER TABLE, 24 HR.**

**WATER TABLE, 1 HR.**

PAGE 1 of 2

**[50] % ROCK CORE RECOVERY**

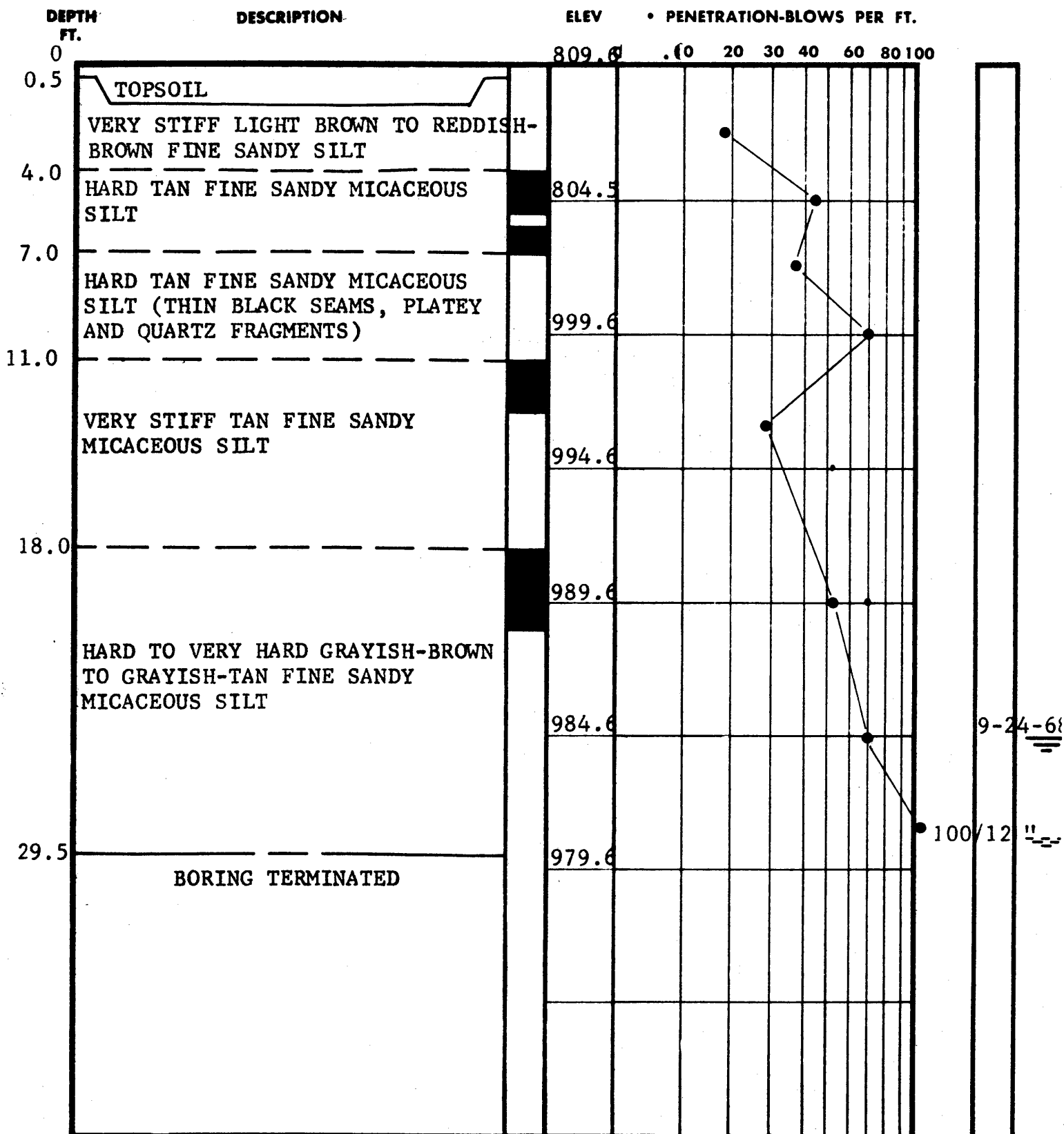
### LOSS OF DRILLING WATER

**LAW ENGINEERING TESTING CO.**









## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-133  
DATE DRILLED 8/26/68  
JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

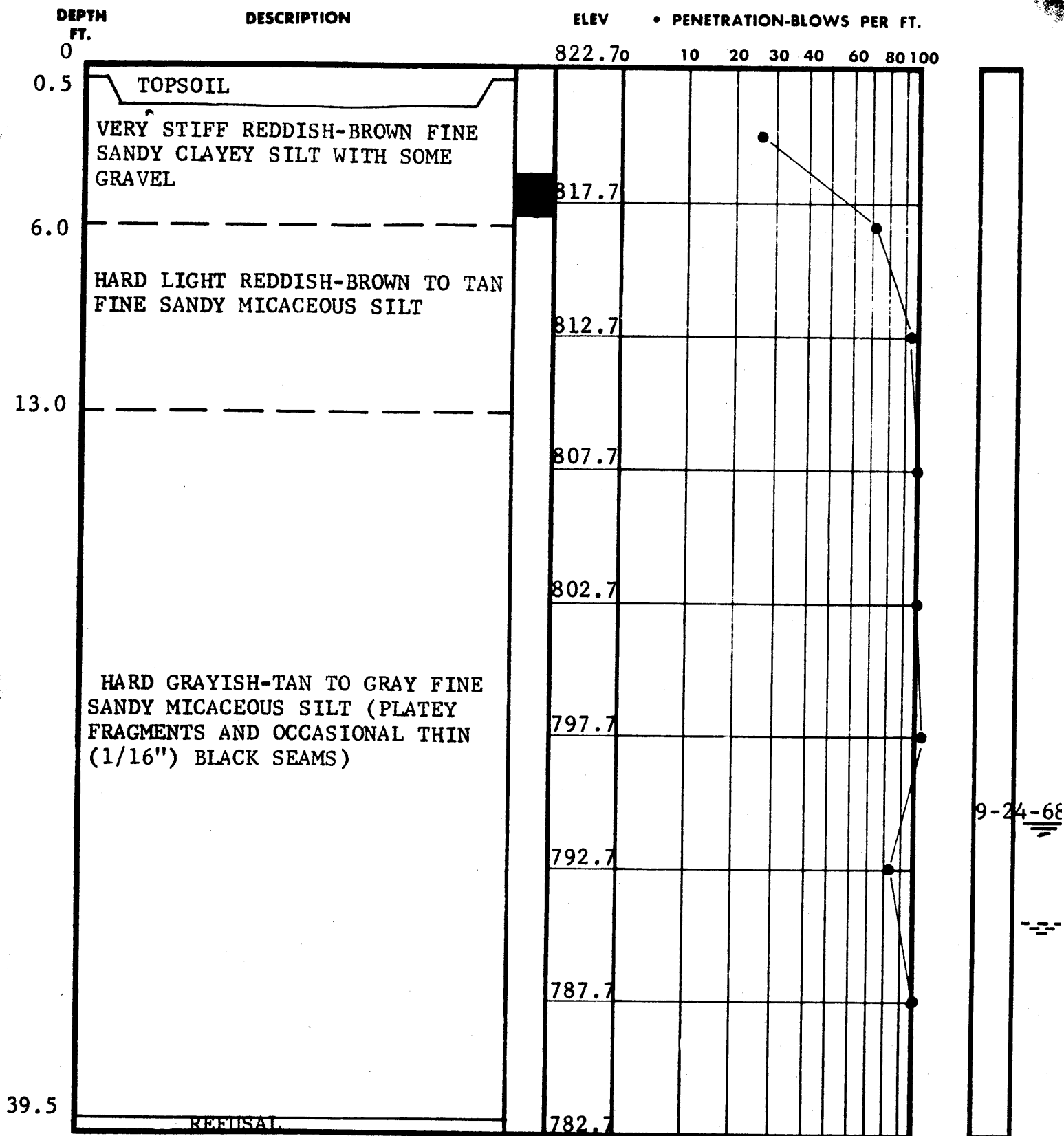
WATER TABLE, 1 HR.

% ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-134

DATE DRILLED 8/26/68

JOB NO. 5862

33

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

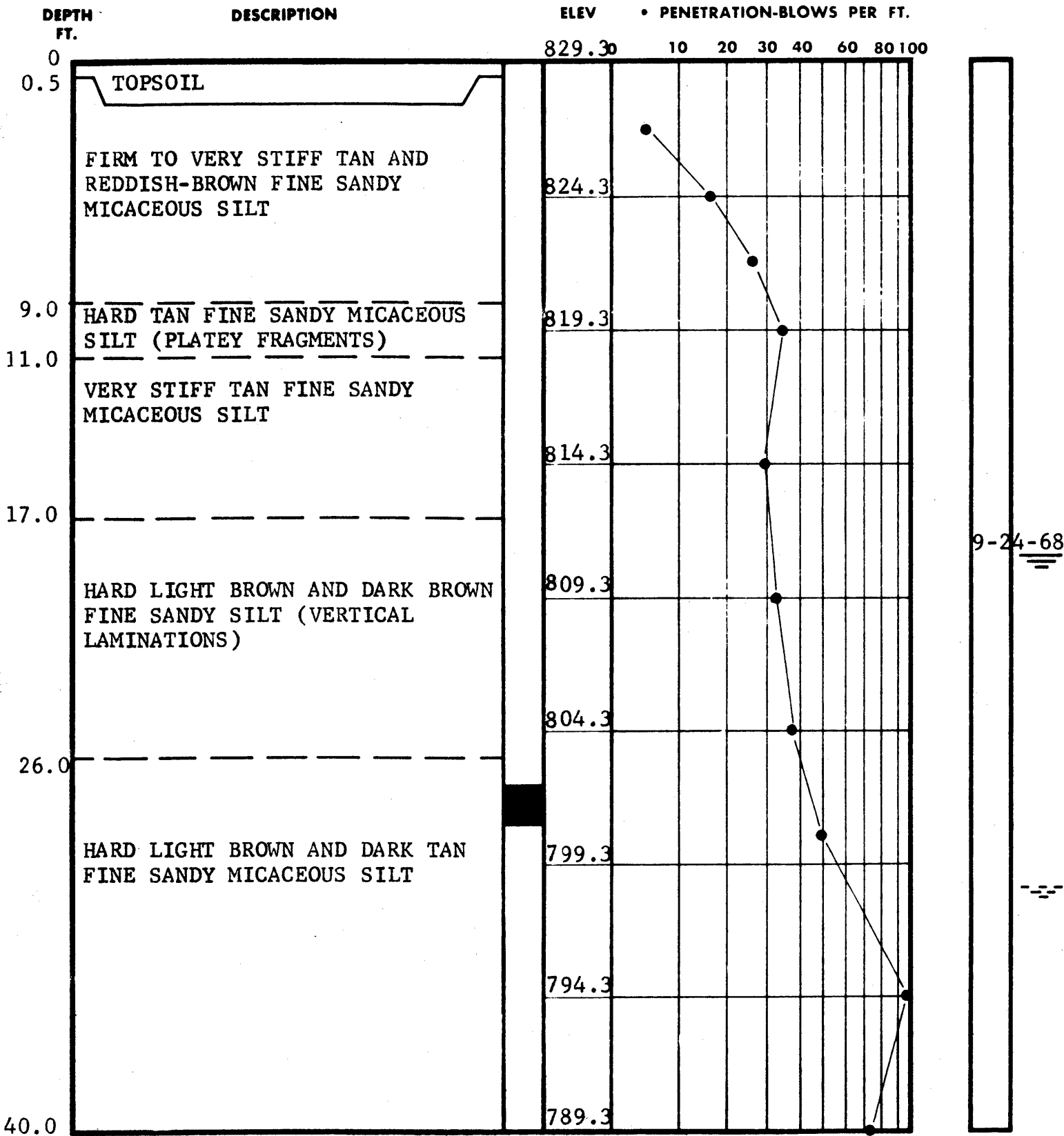
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.









## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113  
 PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

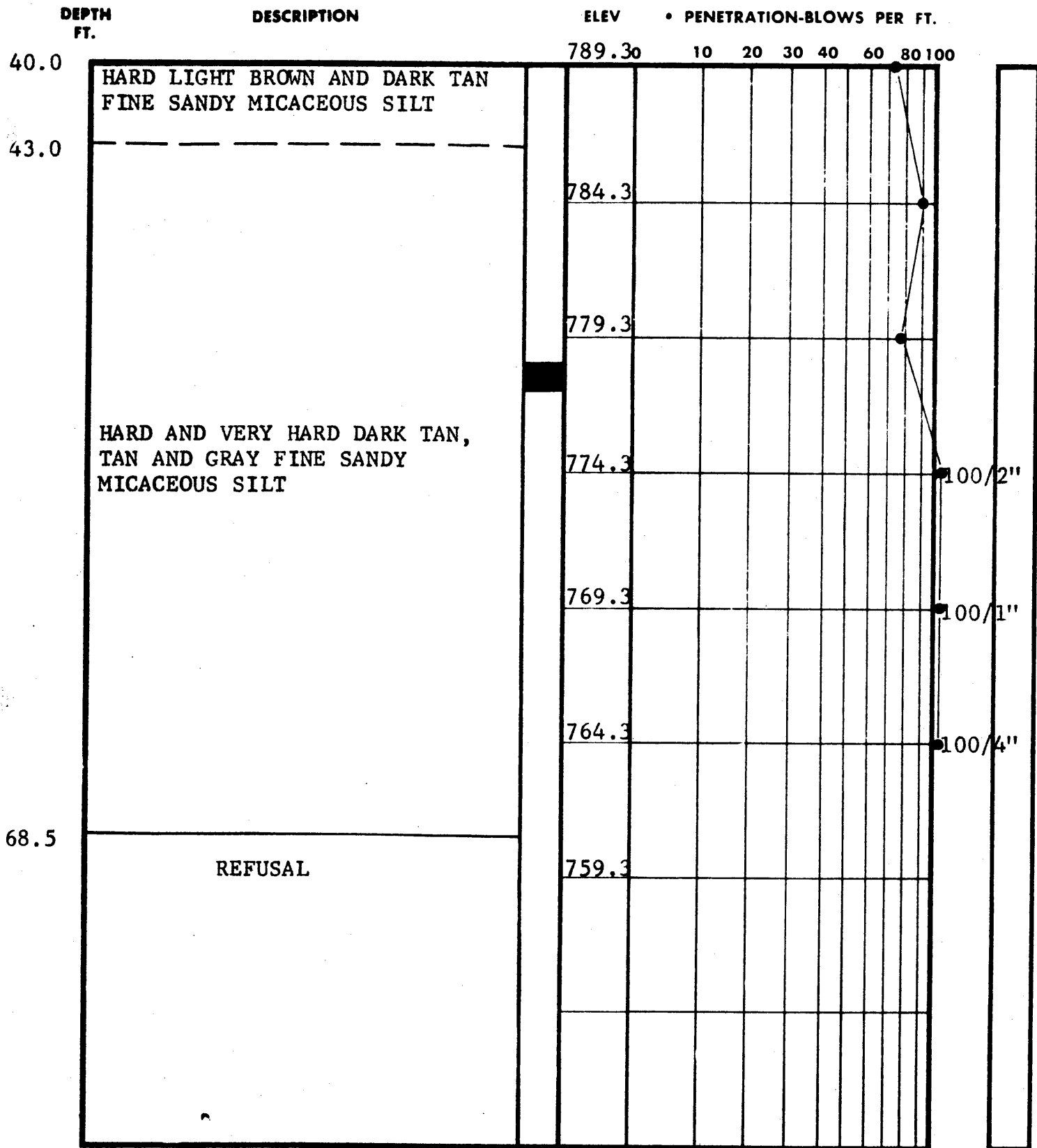
PAGE 1 of 2

BORING NO. B-135  
 DATE DRILLED 8/26/68  
 JOB NO. 5862

jj  UNDISTURBED SAMPLE  
 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
|50| % ROCK CORE RECOVERY  LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-135

DATE DRILLED 8/26/68

JOB NO. 5862

PAGE 2 of 2

kk  
jj



UNDISTURBED SAMPLE



WATER TABLE, 24 HR.



WATER TABLE, 1 HR.

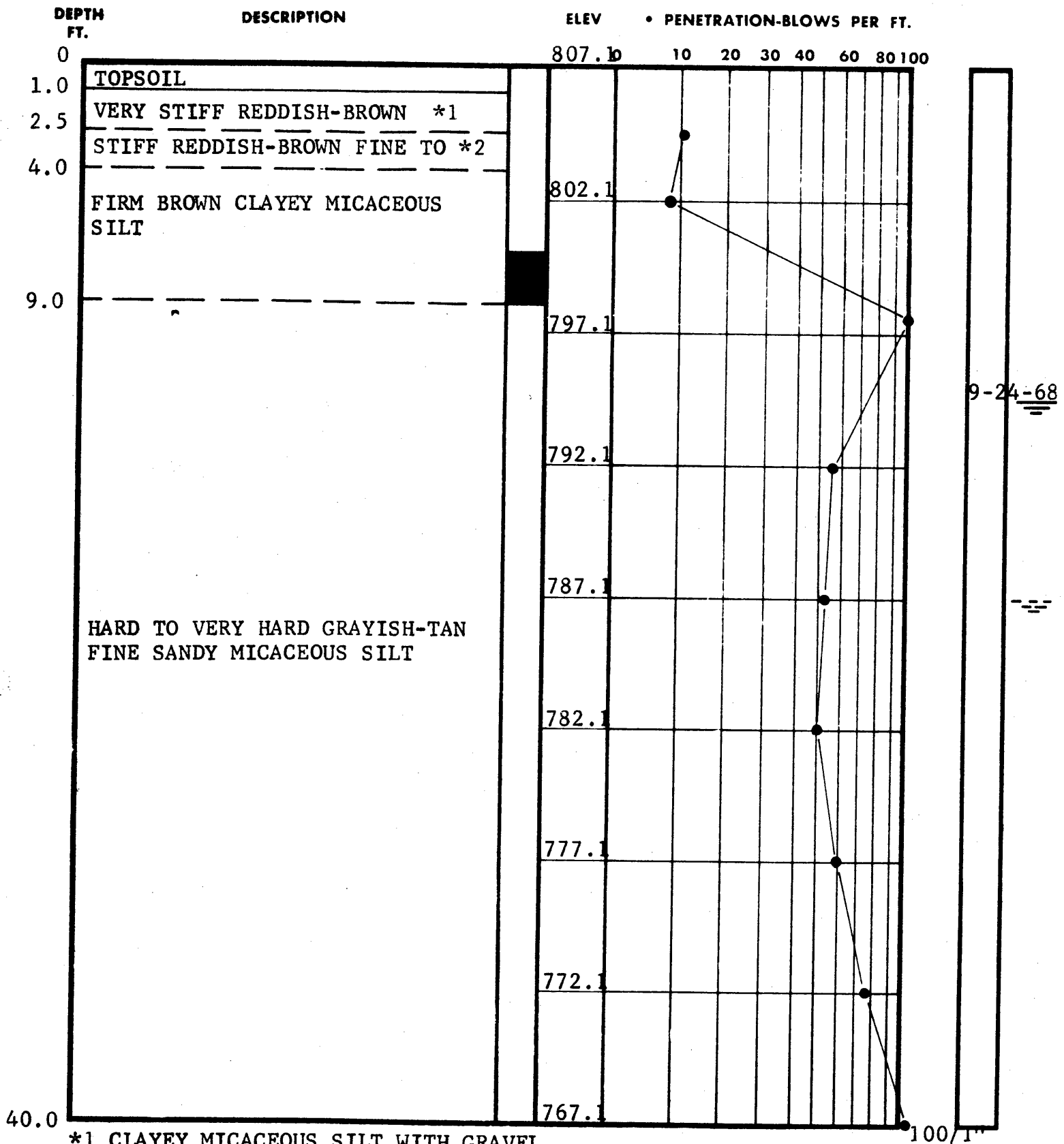
|50| % ROCK CORE RECOVERY



LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 CLAYEY MICACEOUS SILT WITH GRAVEL

\*2 MEDIUM SANDY SLIGHTLY CLAYEY MICACEOUS SILT **TEST BORING RECORD**

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 of 2

BORING NO. B-136

DATE DRILLED 8/27/68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT.									
40.0		767.10	10	20	30	40	60	80	100			
	HARD TO VERY HARD GRAYISH-TAN FINE SANDY MICACEOUS SILT											100/1"
		762.1										100/2"
		757.1										100/6"
52.5	REFUSAL	752.1										

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 of 2

BORING NO. B-136

DATE DRILLED 8/27/68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

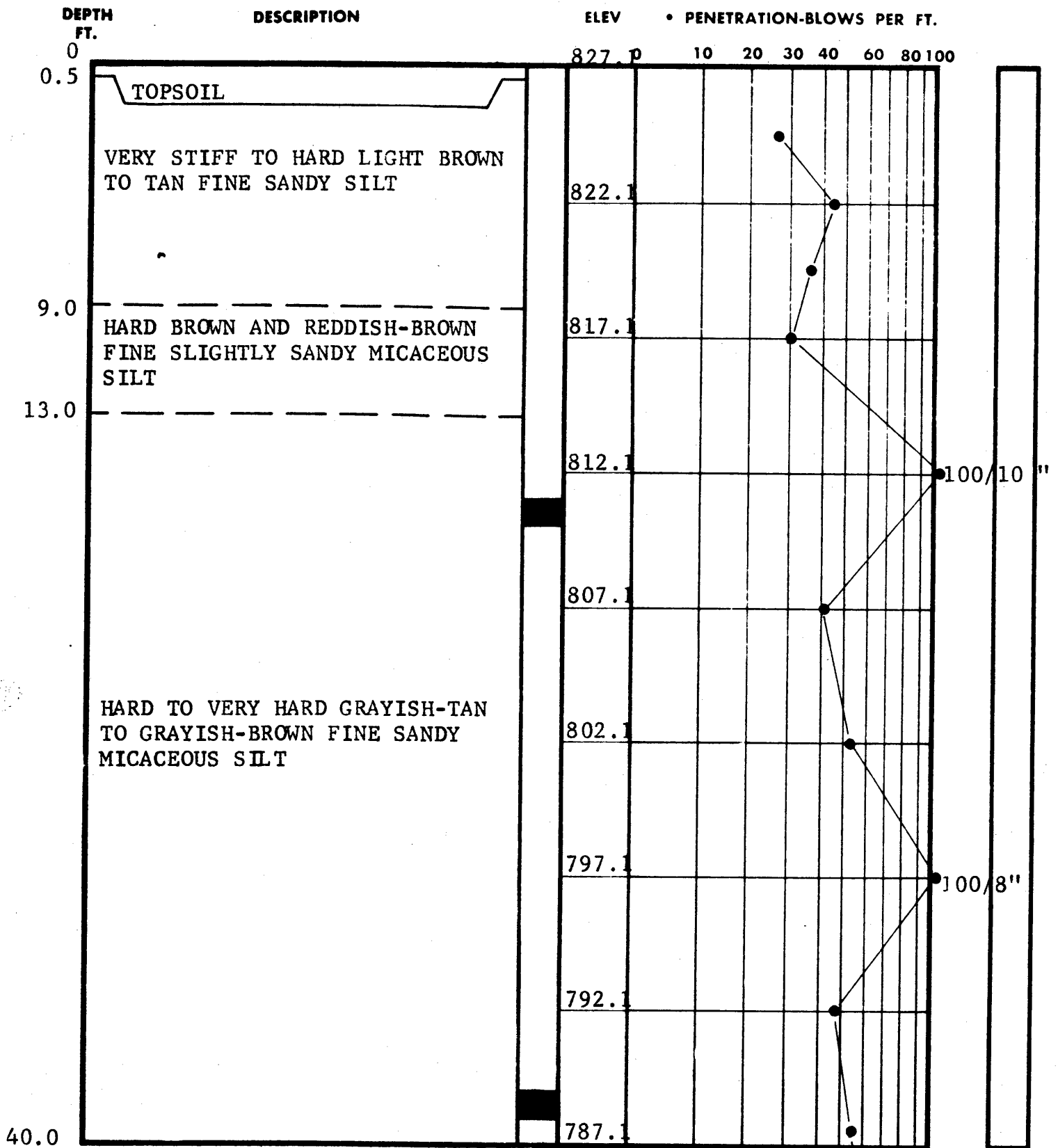
 WATER TABLE, 1 HR.

 50% ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

PAGE 1 of 2

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-137

DATE DRILLED 8/28/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

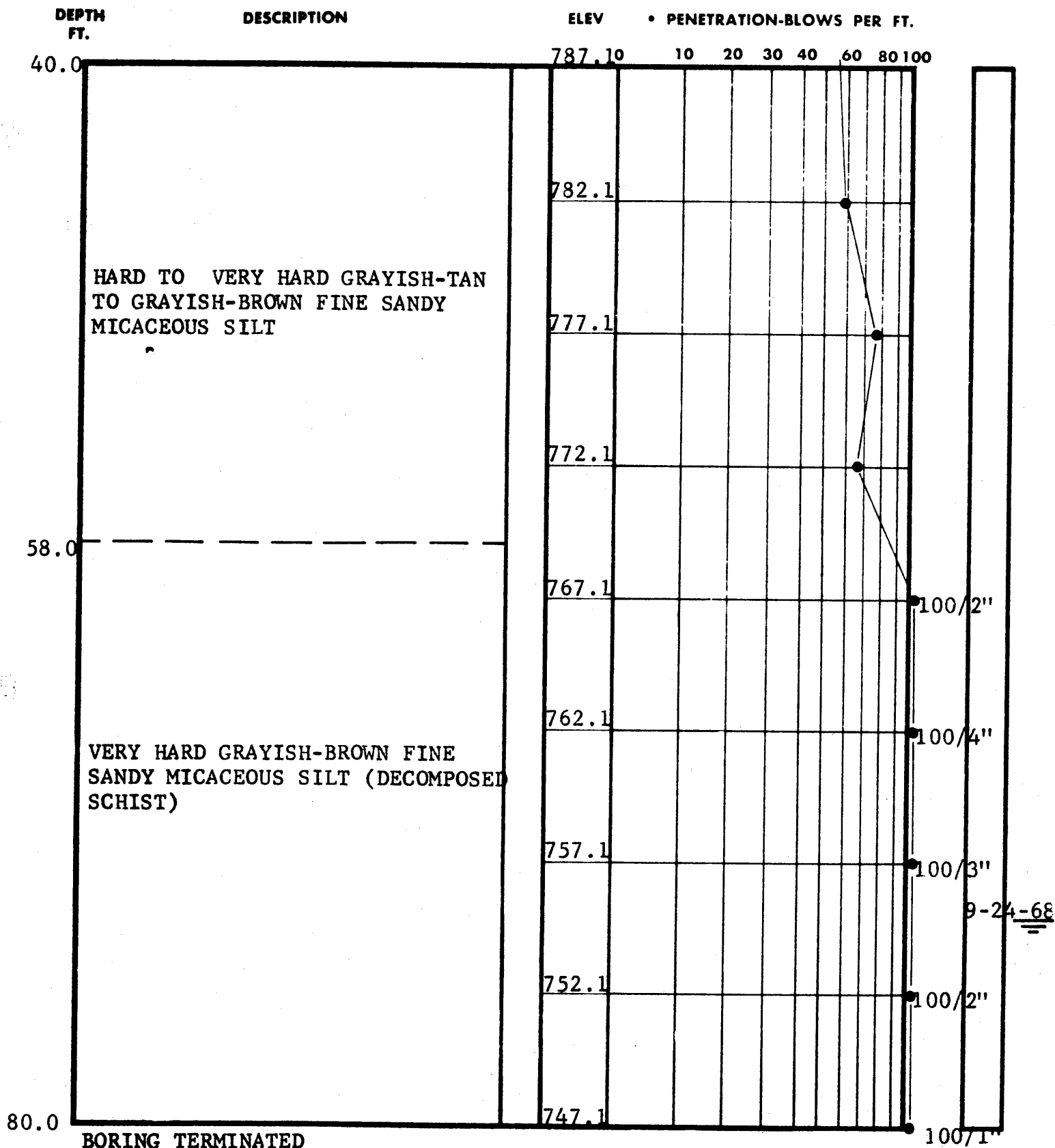
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 2 of 2

BORING NO. B-137

DATE DRILLED 8/28/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

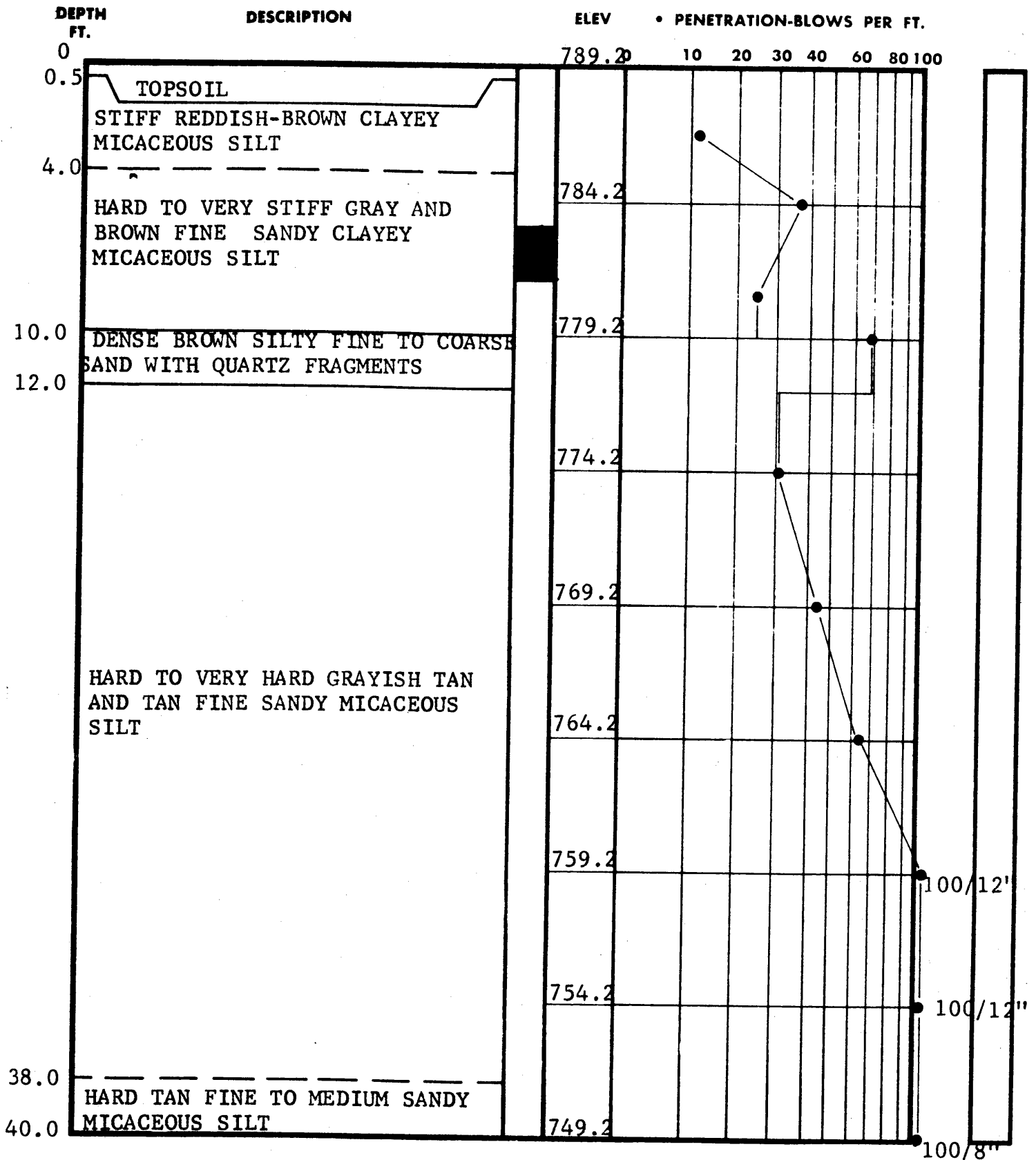
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-138

DATE DRILLED 8/28/68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

PAGE 1 of 2

jj | 50 | % ROCK CORE RECOVERY

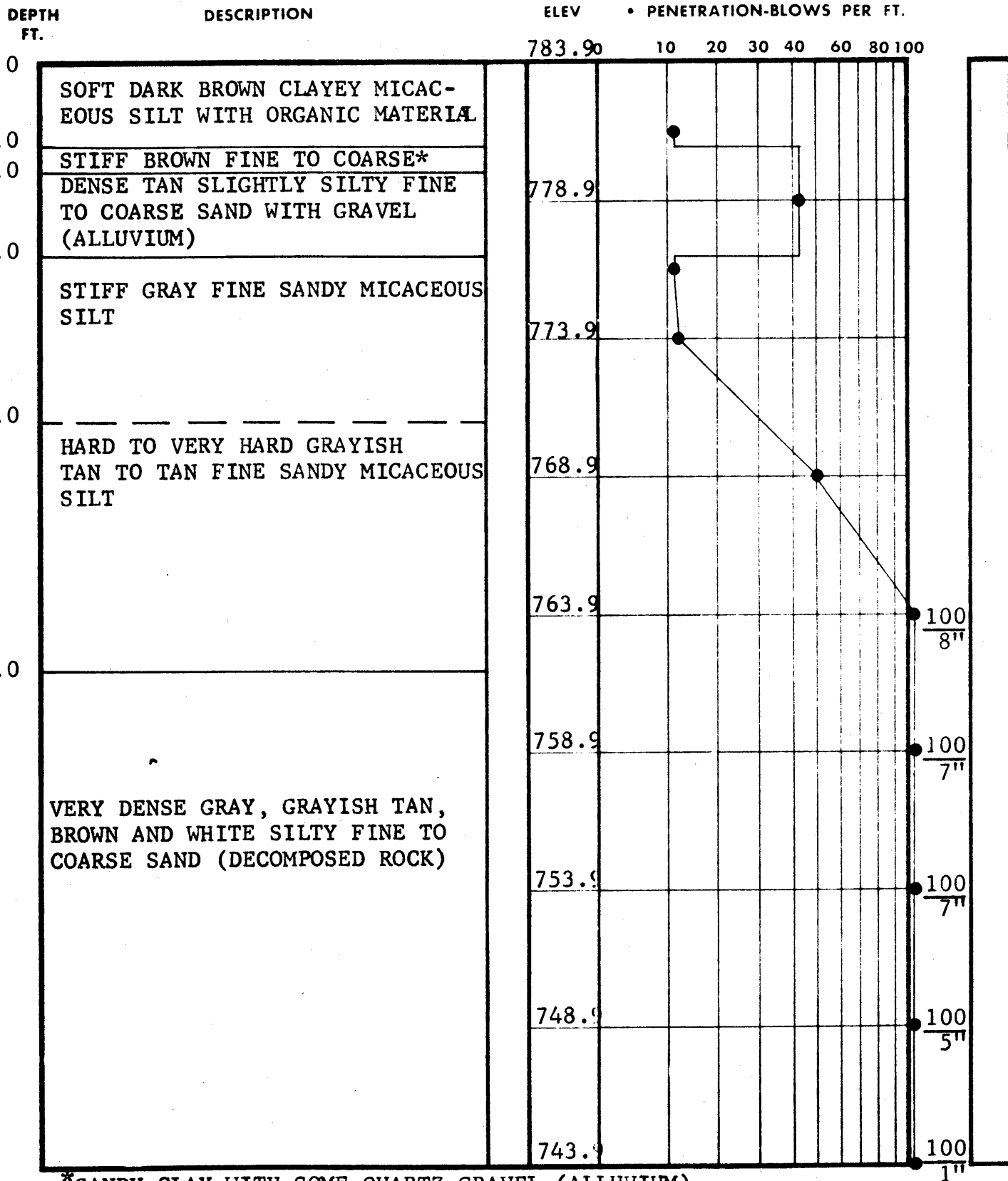
 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.









\*SANDY CLAY WITH SOME QUARTZ GRAVEL (ALLUVIUM)

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

[50] % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

PAGE 1 OF 3

BORING NO. B-139

DATE DRILLED 8-28-68

JOB NO. 5862

LAW ENGINEERING TESTING CO.



• PENETRATION-BLOWS PER FT.

40.0

743.90

10

20

30

40

6

84

100

00

71

100

 $2'$ 

100

61

738.9

733.0

728.0

VERY DENSE GRAY, GRAYISH TAN,  
BROWN AND WHITE SILTY FINE  
TO COARSE SAND (DECOMPOSED ROCK)  
(NO SPOON SAMPLES RECOVERED AT  
40' AND 45')

REFUSAL  
SEE CORE BORING RECORD

## TEST BORING RECORD

**BORING AND SAMPLING MEETS ASTM D-1586**  
**CORE DRILLING MEETS ASTM D-2113**

**PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.**

PAGE 2 OF 3

BORING NO. B-139

DATE DRILLED 8-28-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

**WATER TABLE, 24 HR.**

**WATER TABLE, 1 HR.**

**|50| % ROCK CORE RECOVERY**

### LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV. 729.4	REMARKS
54.5	MODERATELY HARD TAN GRAY GNEISS	25	724.4	54.5'-60.8' FRACTURED (PIECES 1"-2" IN LENGTH)
60.8	HARD GRAY GNEISS	95	719.4	60.8'-84.5' SOUND AND CONTINUOUS
68.2	HARD GRAYISH WHITE *1	100	714.4	
69.2	HARD GRAY GNEISS	95	709.4	
	HARD GRAY GNEISS	87	704.4	74.5'-74.7' -CLOSED VERTICAL JOINT
		100	699.4	84.0'-84.5' BROKEN
84.5	CORING TERMINATED			

\*1 PEGMATITE  
NO DRILLING WATER LOSS RECORDED

# CORE BORING RECORD

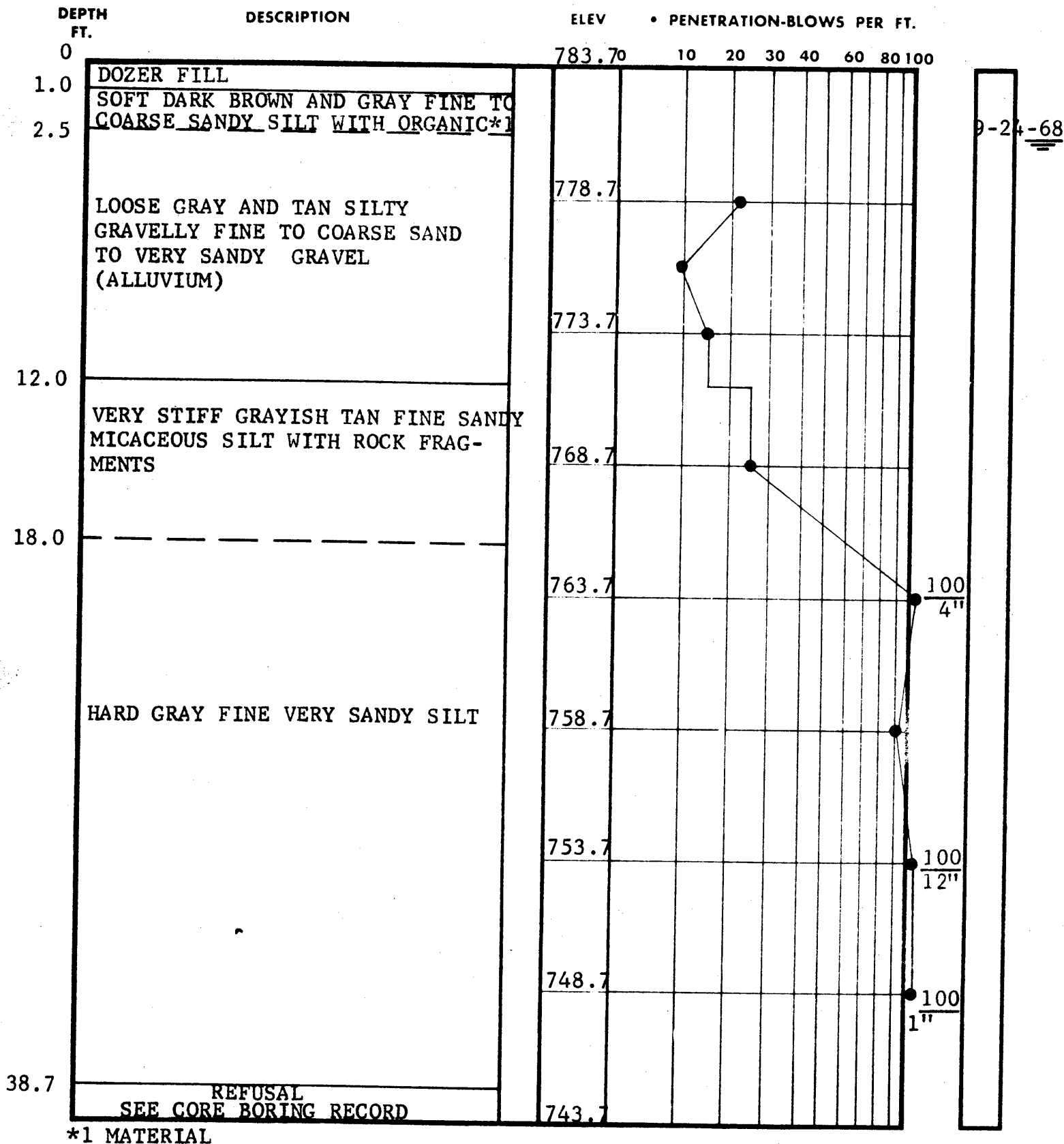
PAGE 3 OF 3

BORING NO. B-139  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.





\*1 MATERIAL

## TEST BORING RECORD





BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 2

BORING NO. B-140

DATE DRILLED 8/29/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE  
 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
|50| % ROCK CORE RECOVERY  LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
38.7			745.0	
	MODERATELY HARD GRAY GNEISS	37		38.7'-43.7' FRACTURED AND BROKEN (PIECES 1"-2" IN LENGTH)
			740.0	
		97		43.7'-46.1' BROKEN (PIECES 6"-12" IN LENGTH)
			735.0	46.1'-48.7' FRACTURED (PIECES 1"-10" IN LENGTH)
48.7		93		50.5'-51.0' TWO OPEN STAINED FRACTURES AND ONE CLOSED
	HARD GRAY GNEISS	BX	730.0	VERTICAL JOINT
		100		53.7'-58.7' SLIGHTLY FRACTURED (PIECES 6"-10" IN LENGTH)
			725.0	54.5'-55.1' NUMEROUS FRACTURES
		74		58.7'-61.8' SLIGHTLY BROKEN (PIECES 6"- 10" IN LENGTH)
63.1		87	AX	
	CORING TERMINATED		720.0	61.8'-63.1' BROKEN (PIECES 1"-3" IN LENGTH)

NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD

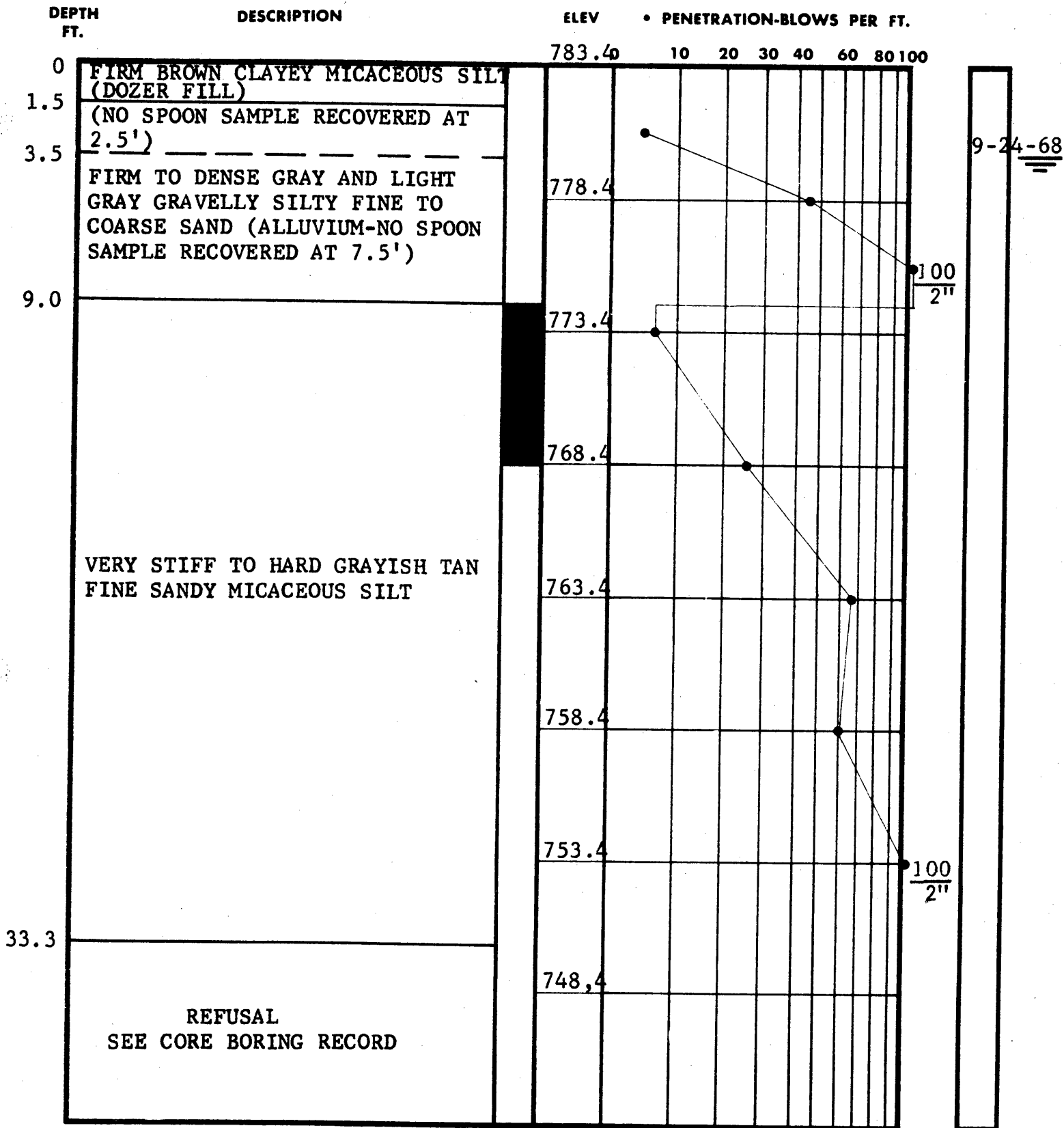
PAGE 2 OF 2

BORING NO. 140  
JOB NO. 5862

WATER TABLE

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 2

BORING NO. B-141

DATE DRILLED 9/4/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

 50% ROCK CORE RECOVERY

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV.	REMARKS
33.2			750.1	
	VERY SOFT GRAYISH BROWN GNEISS	37		
			745.1	
		8		
			740.1	
43.4	SOFT GRAYISH TAN GNEISS			43.4'-44.7' FRACTURED (PIECES 1"-3" IN LENGTH)
44.7		30		44.7'-71.5' GENERALLY SOUND AND CONTINUOUS
	MODERATELY HARD GRAY GNEISS	BX	735.1	48.2'-48.3' STAINED VERTICAL JOINT
		68		50.0'-50.2' STAINED JOINT DIPPING 50°
			730.1	53.2'-54.0' FRACTURED (PIECES 1"-2" IN LENGTH)
53.9	SOFT GREENISH GRAY SCHIST	91		53.4'-54.3' THREE NEARLY VERTICAL CLOSED JOINTS
54.0			725.1	61.6'-62.1' THREE NEARLY VERTICAL CLOSED JOINTS
	HARD GRAY GNEISS	78		62.1'-62.7' FRACTURED, SEVERAL JOINTS DIPPING 75°
		93	720.1	62.7'-63.1' TWO CLOSED JOINTS DIPPING 75°
		AX		63.1'-63.2' OPEN JOINT DIPPING 75°
67.6	HARD WHITE QUARTZ		715.1	63.2'-63.8' TWO CLOSED JOINTS DIPPING 75°
68.5	HARD GRAY GNEISS	88		63.8'-64.0' CLOSED JOINT DIPPING 80°
71.5	CORING TERMINATED		710.1	

NO DRILLING WATER LOSS RECORDED

Page 2 of 2

## CORE BORING RECORD

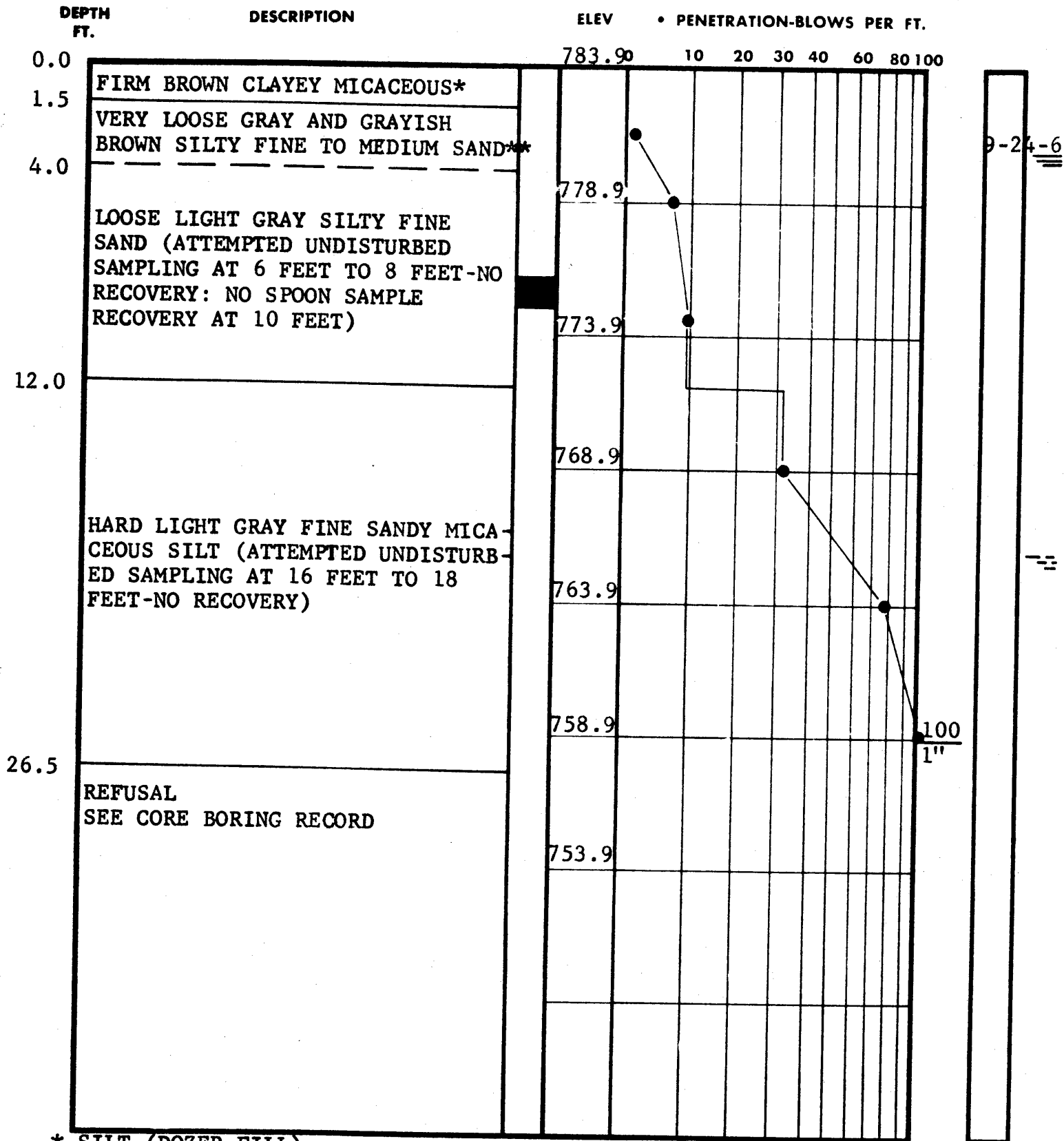
BORING NO. 141  
JOB NO. 5862

jj

WATER TABLE

LAW ENGINEERING TESTING CO.





\* SILT (DOZER FILL)  
\*\* WITH ORGANIC MATERIAL

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

abc  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

◀ LOSS OF DRILLING WATER

BORING NO. B-142

DATE DRILLED 9-5-68

JOB NO. 5862

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	CORE BIT % SIZE	ELEV. 757.4	REMARKS
26.5	SOFT GRAY GNEISS	74		26.5'-26.8' QUARTZ SEAM
29.8	MODERATELY HARD GRAY GNEISS	100	752.4	27.0'-27.7' OPEN STAINED JOINT DIPPING 70° INTERSECTED BY NEARLY VERTICAL STAINED JOINT
36.8			747.4	28.5'-29.8' TWO STAINED JOINTS, VER- TICAL AND DIPPING 50°
37.0	SOFT GRAY GNEISS	91		31.7'-31.9' OPEN STAINED JOINT DIPPING 60°
39.8	MODERATELY HARD GRAY GNEISS			33.1'-34.1' FOUR STAINED FRACTURES
			BX 742.4	34.9'-36.4' CLOSED STAINED VERTICAL JOINT
		100		35.2'-36.0' BROKEN (PIECES 1"-4" IN LENGTH)
	HARD GRAY GNEISS	80	737.4	38.0'-39.8' BROKEN (PIECES 6" IN LENGTH)
				39.0'-39.2' CLOSED VERTICAL JOINT
			732.4	40.8'-41.2' TWO STAINED FRACTURES
		100		43.1' STAINED FRACTURE
				44.8'-48.1' HARD AND CONTINUOUS
54.3	CORING TERMINATED		727.4	48.1'-48.3' FRACTURED 49.8'-50.6' BROKEN 50.6'-54.3' BROKEN (PIECES 2" TO 6" IN LENGTH)

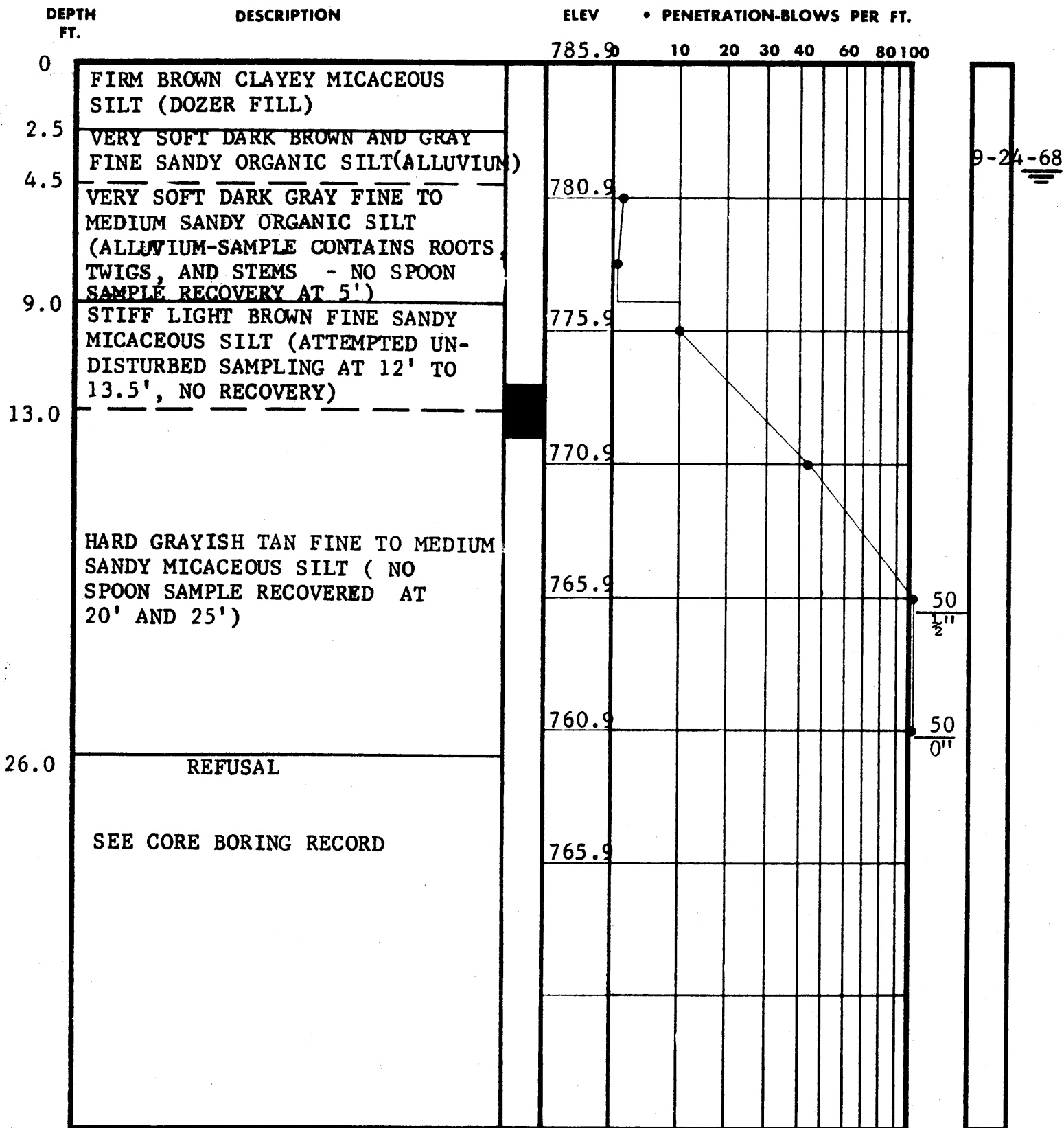
NO DRILLING WATER LOSS RECORDED

## CORE BORING RECORD

BORING NO. 142  
JOB NO. 5862

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586

CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

PAGE 1 OF 2

BORING NO. B-143

DATE DRILLED 9/10/68

JOB NO. 5862

jj

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

[50] % ROCK CORE RECOVERY

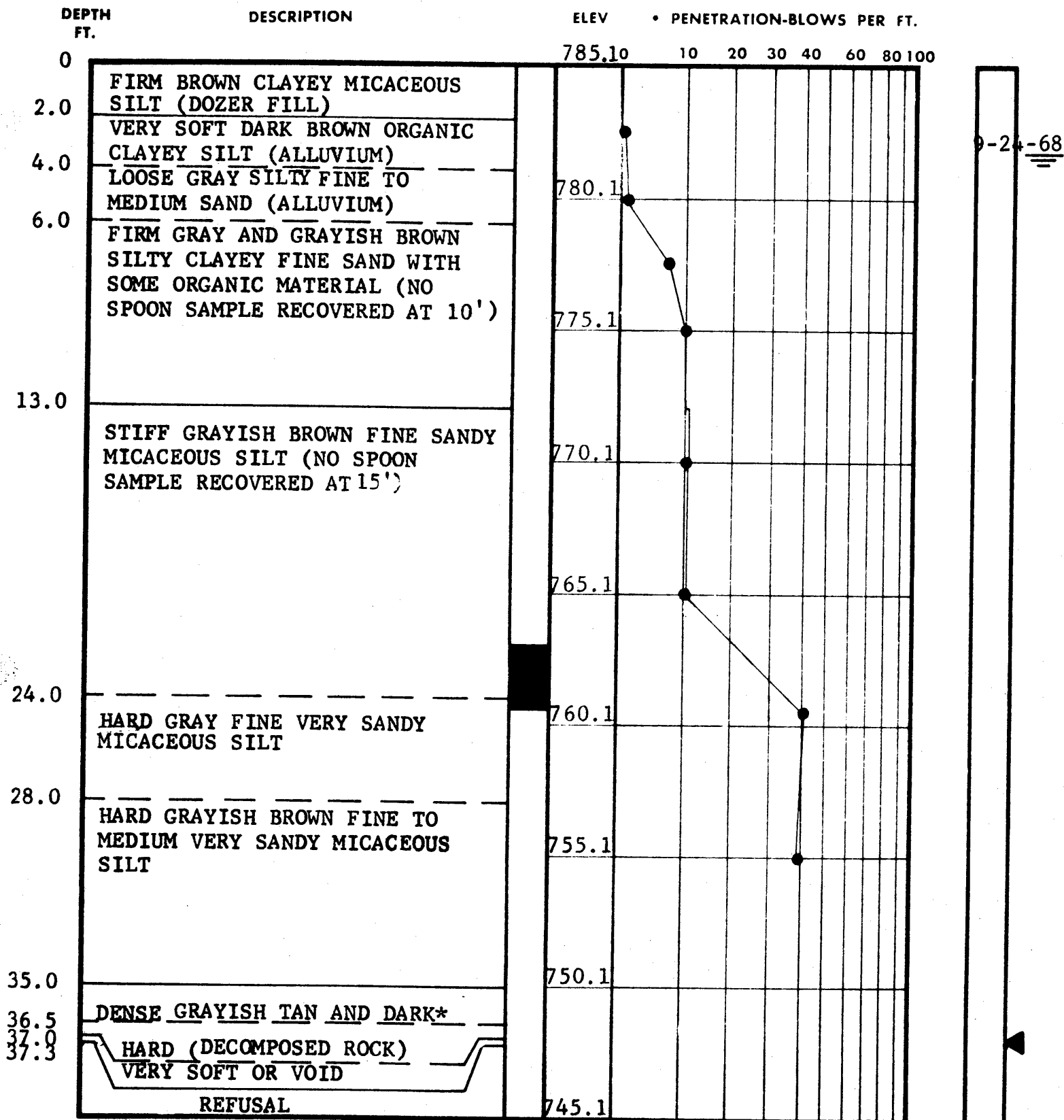
LOSS OF DRILLING WATER

I A W ENGINEERING TESTING CO









SEE CORE BORING RECORD

\* BROWN SILTY FINE TO COARSE MICACEOUS SAND (DECOMPOSED ROCK)

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-145

DATE DRILLED 9-10-68

JOB NO. 5862

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 50% ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.











DEPTH  
FT.

DESCRIPTION

CORE BIT ELEV.  
% SIZE 766.2

REMARKS

25.0

SOFT GRAY GNEISS

72 NX

25.0 - 30.0 SOME OPEN  
FRACTURES

28.6

VERY SOFT GRAY GNEISS

761.2

31.5 OPEN FRACTURE

30.0

MODERATELY HARD GRAY GNEISS

32.4 - 33.3 THREE

OPEN FRACTURES

34.4 OPEN FRACTURE

32.8

100 NX

HARD GRAY GNEISS

35.0

756.2

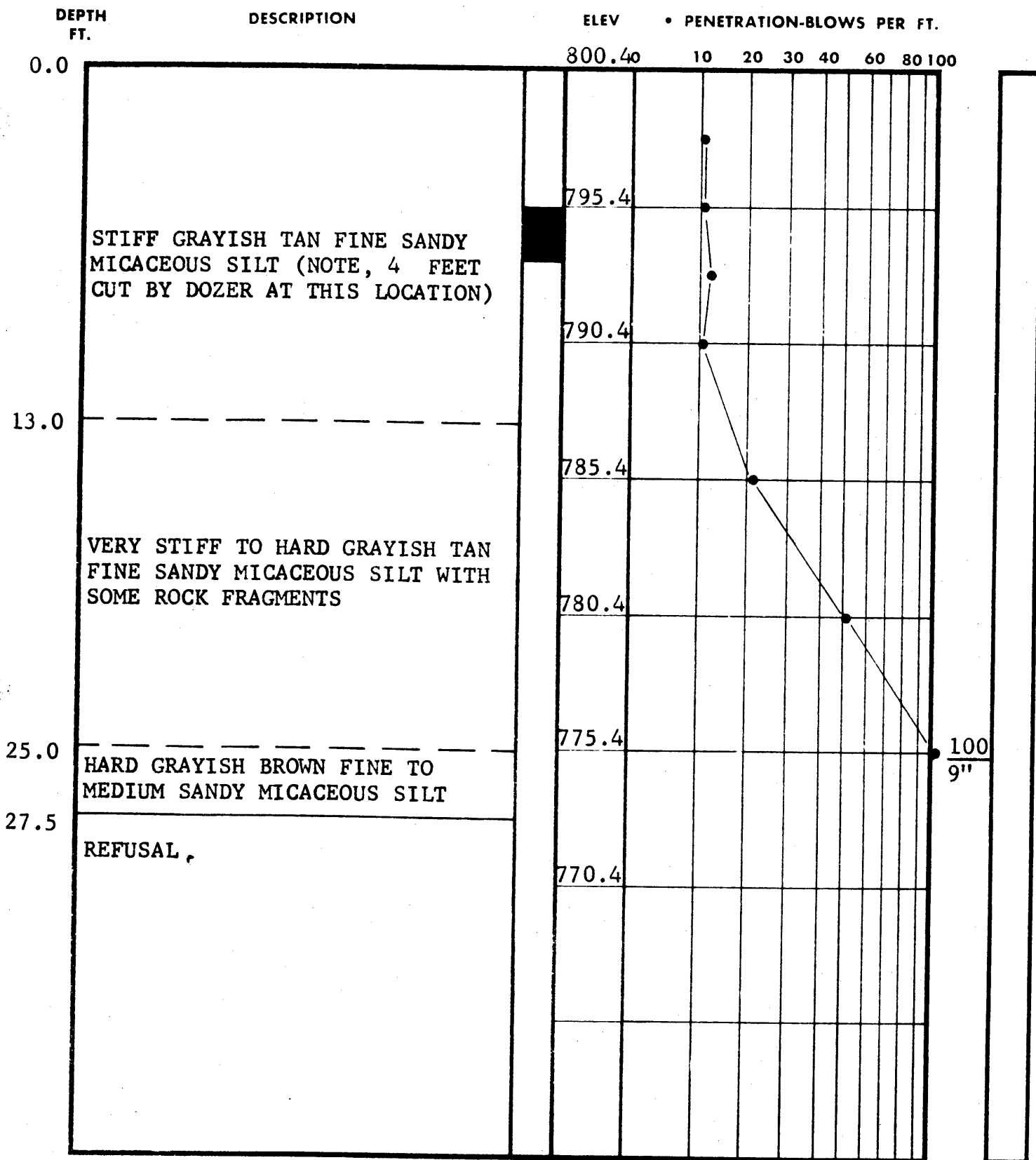
CORING TERMINATED

## CORE BORING RECORD

BORING NO. B-146

JOB NO. 5862





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-147  
DATE DRILLED 9-26-68  
JOB NO. 5862

abc  UNDISTURBED SAMPLE

[50] % ROCK CORE RECOVERY

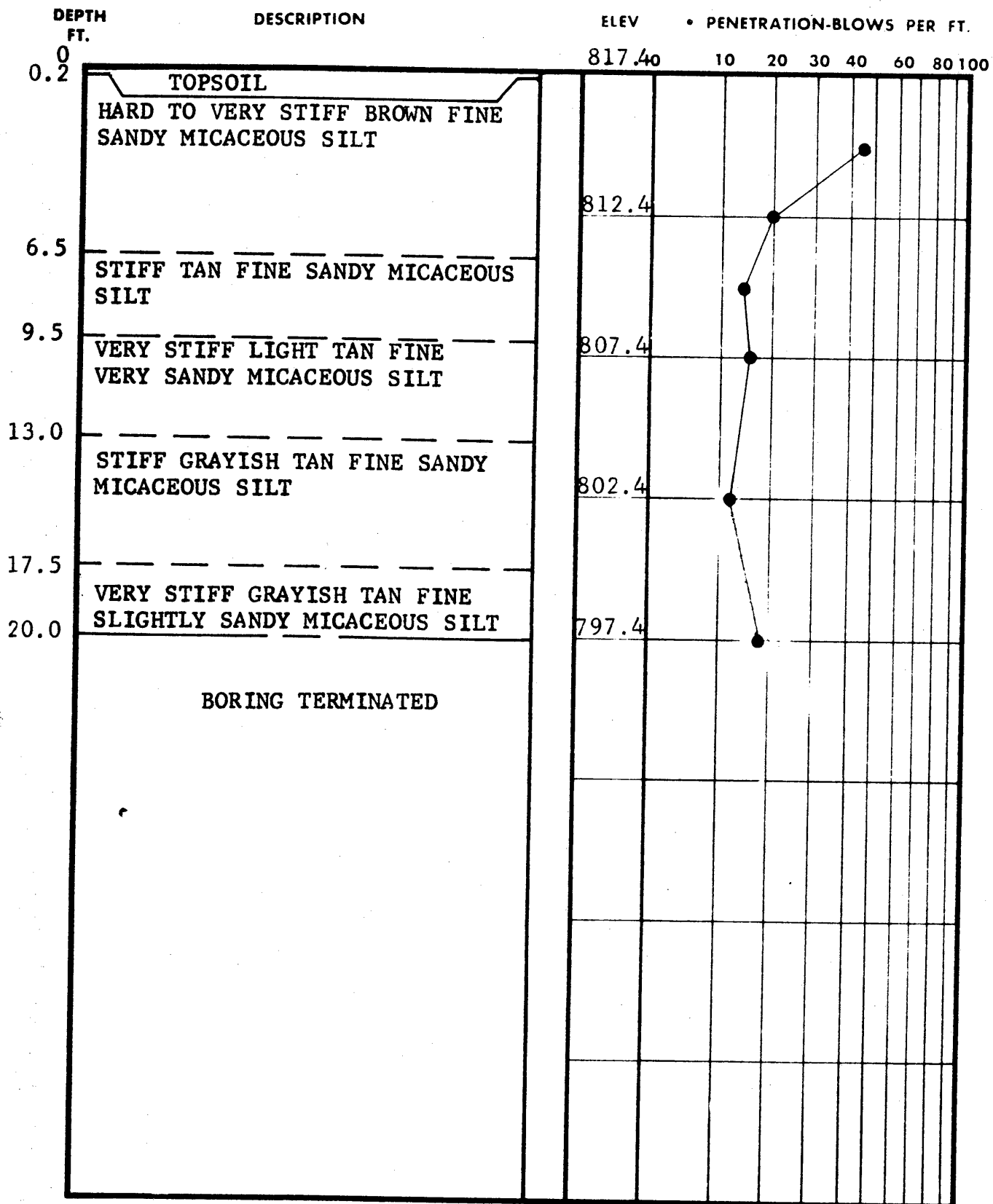
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-148

DATE DRILLED 9-16-68

JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

50% ROCK CORE RECOVERY

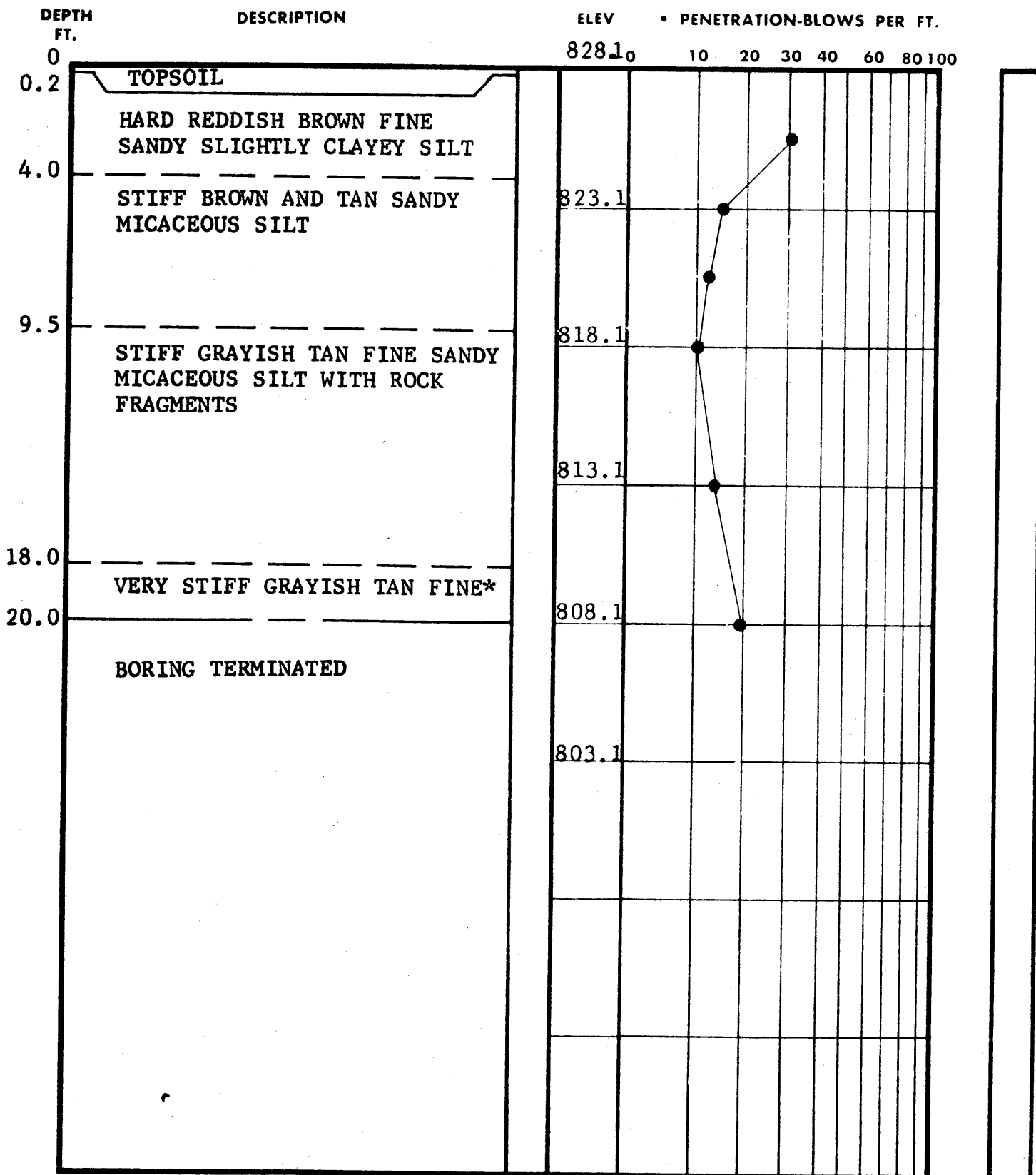
LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.









NO GROUND WATER ENCOUNTERED  
\*SANDY TO VERY SANDY MICACEOUS SILT

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-150

DATE DRILLED 9-16-68

JOB NO. 5862

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

|30| % ROCK CORE RECOVERY

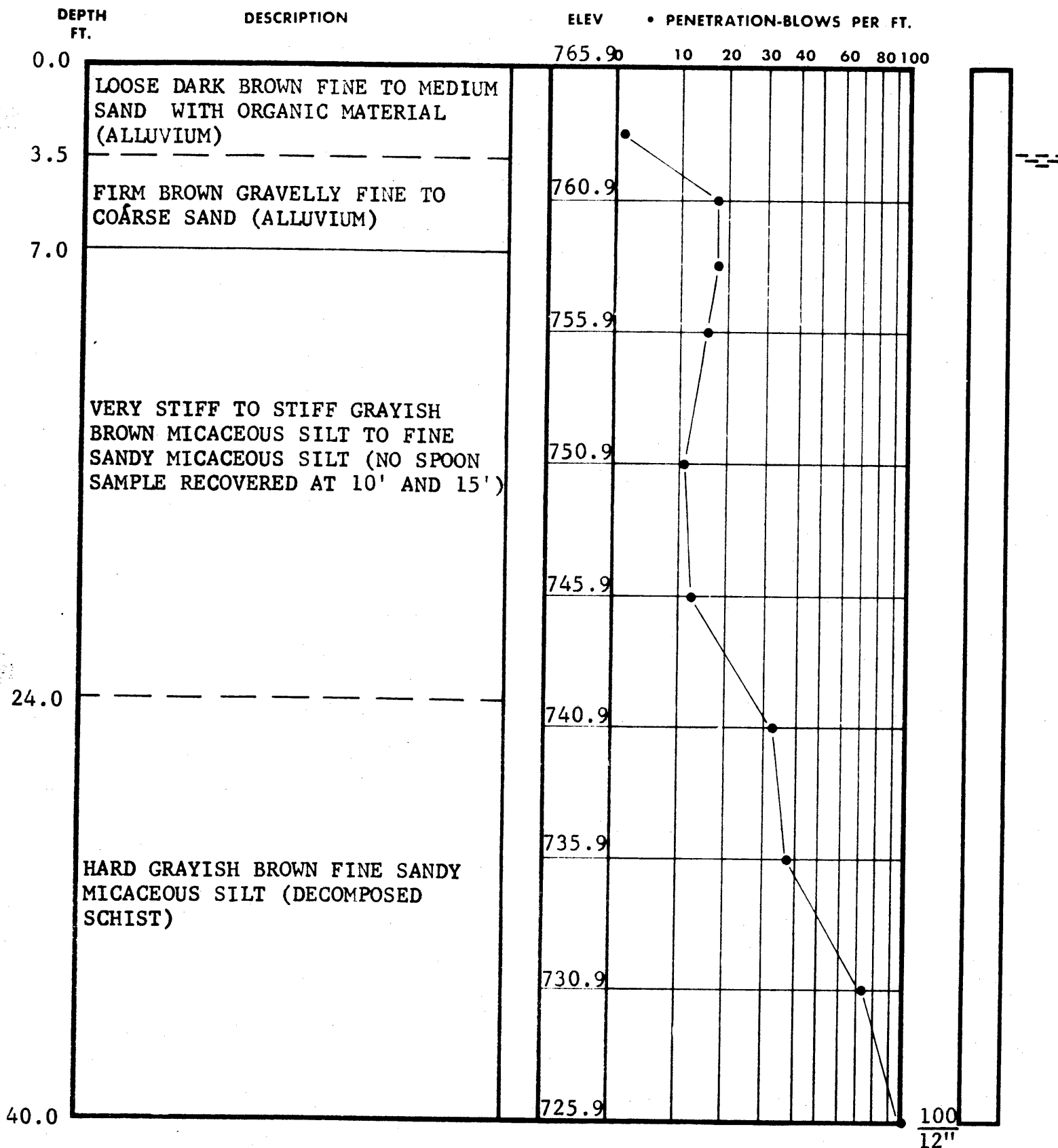
LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.









## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 2

BORING NO. B-152

DATE DRILLED 9-17-68


JOB NO. 5862

abc  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

[50] % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT.									
40.0	HARD GRAYISH BROWN FINE SANDY MICACEOUS SILT (DECOMPOSED SCHIST)	725.90	10	20	30	40	60	80	100	100	12"	
46.5		720.9									100	6"
	REFUSAL	715.9										

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 2 of 2

BORING NO. B-152  
DATE DRILLED 9-17-68  
JOB NO. 5862

abc  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

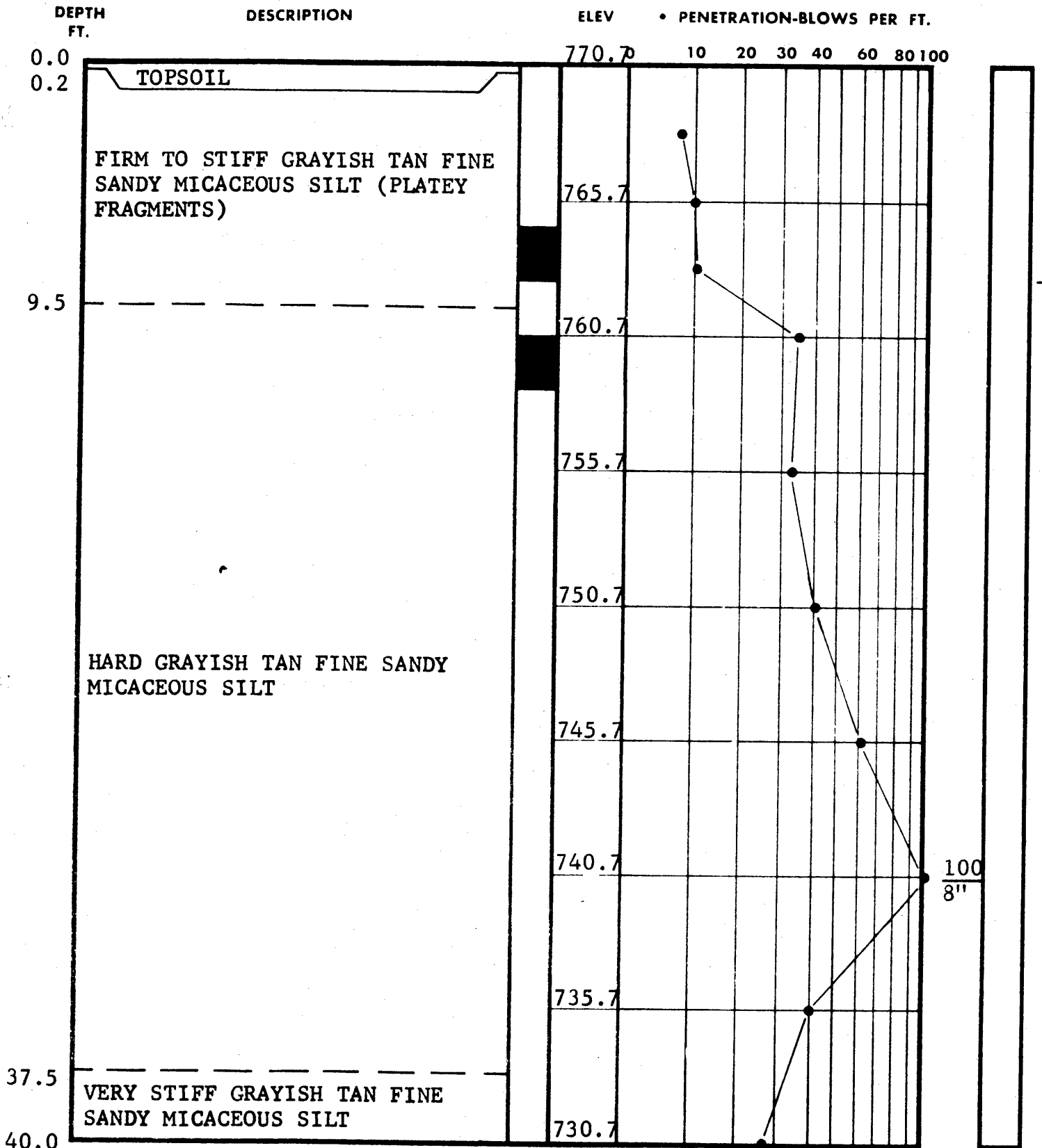
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 2

BORING NO. B-153

DATE DRILLED 9-17-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

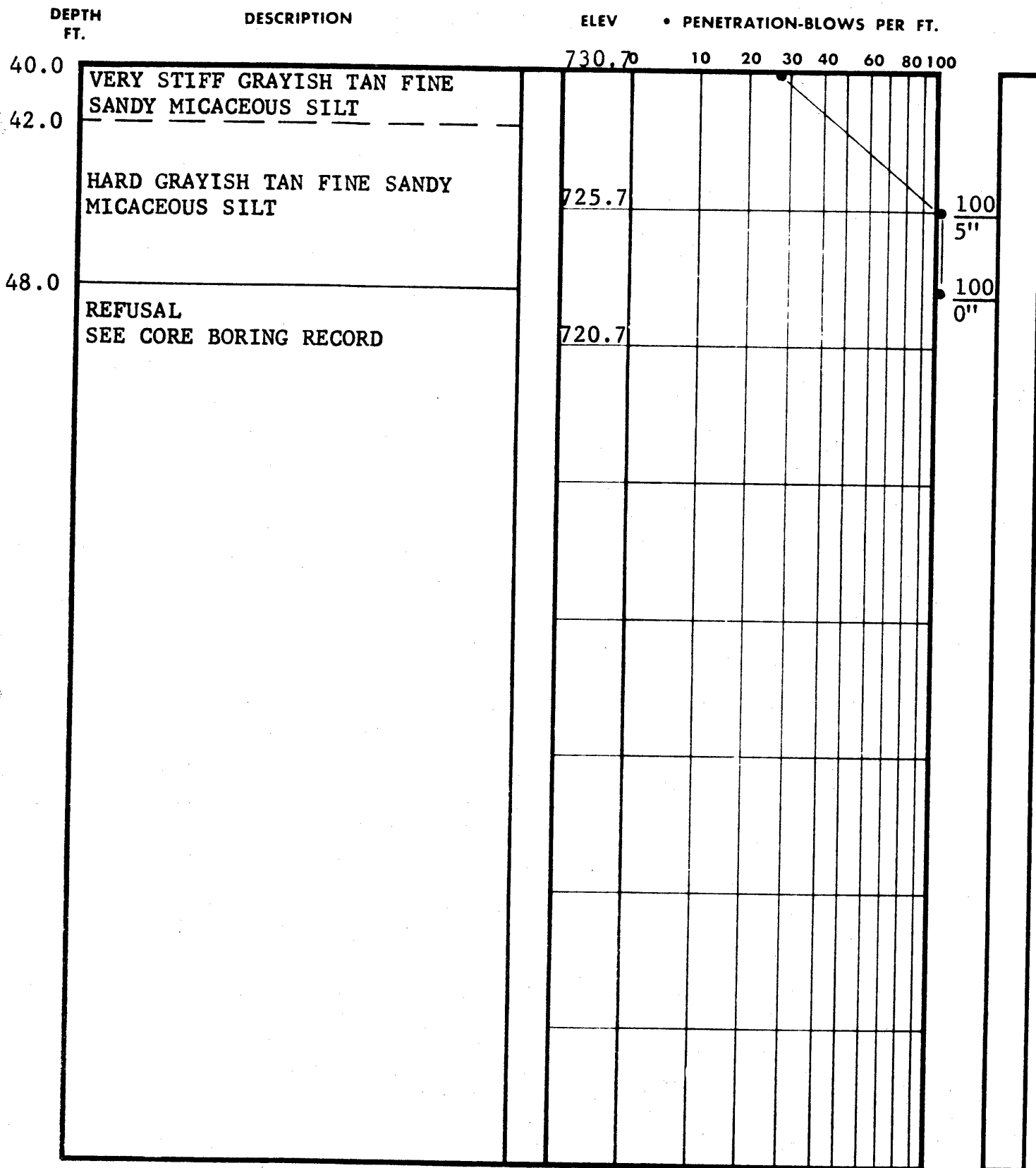
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO





# TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113  
 PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-153

DATE DRILLED 9-17-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

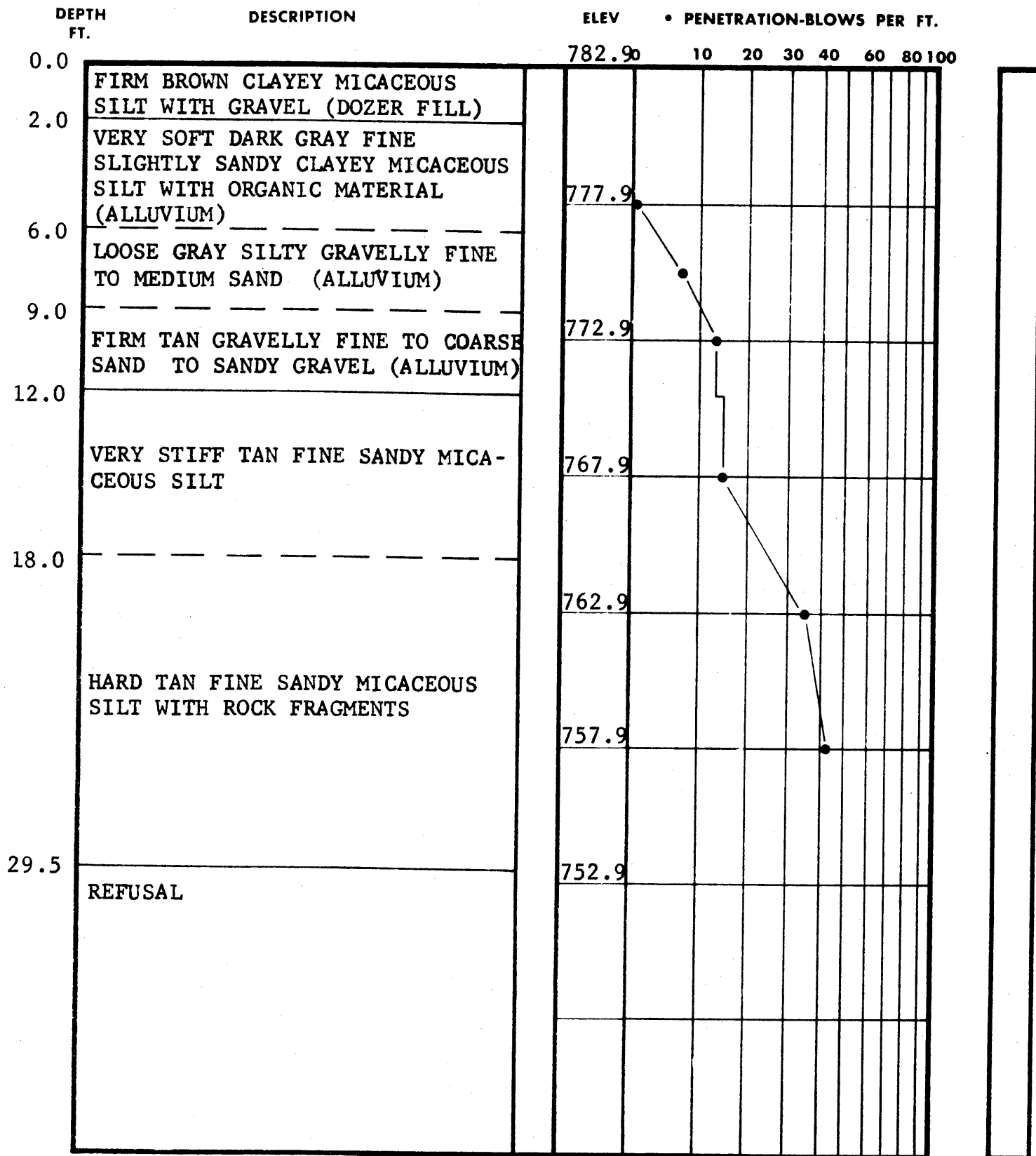
 50% ROCK CORE RECOVERY

 LOSS OF DRILLING WATER









## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-154

DATE DRILLED 9-23-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR

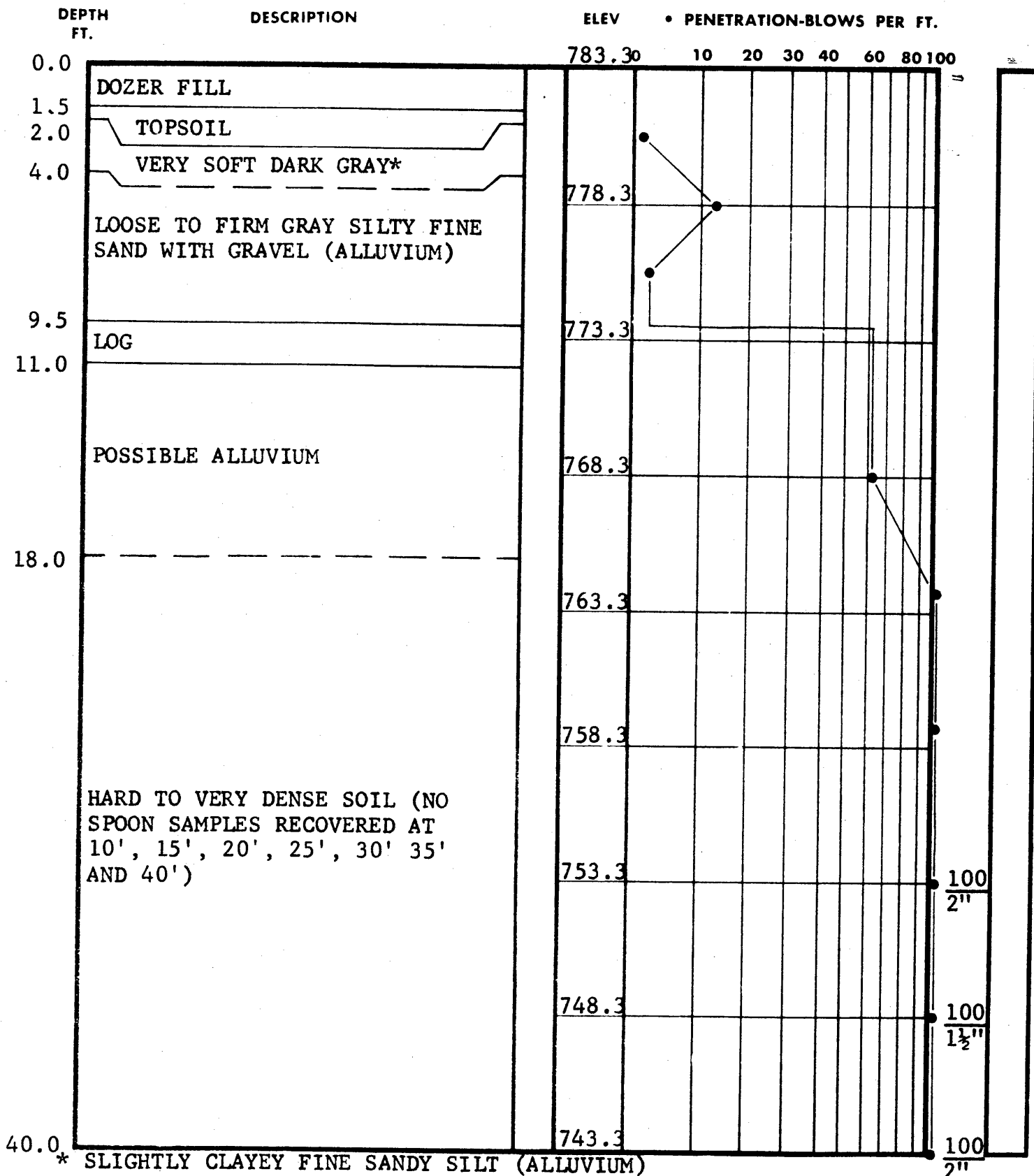
 WATER TABLE, 1 HR.

| 50 | % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 3

BORING NO. B-155

DATE DRILLED 9-23-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



• **PENETRATION-BLOWS PER FT.**

 $\overline{2''}$ 

738.3

733.3

**LAW ENGINEERING TESTING CO.**

50 % ROCK CORE RECOVERY



DEPTH  
FT.  
46.0

DESCRIPTION

CORE BIT ELEV.  
% SIZE 737.3

REMARKS

56.0

MODERATELY HARD GRAY GNEISS	44	BX	732.3	46.0' - 51.0' OPEN VERTICAL JOINT, 1.2' IN LENGTH
	90	BX	727.3	51.1' - 51.3' INTERSECTING STAINED JOINTS, VERTICAL AND DIPPING 40°
CORING TERMINATED				51.0' - 56.0' BROKEN AND SLIGHTLY FRACTURED (PIECES 11" - 1" IN LENGTH)

CORE BORING RECORD

Page 3 of 3

BORING NO. B-155  
JOB NO. 5862

abc.

WATER TABLE

LAW ENGINEERING TESTING CO.



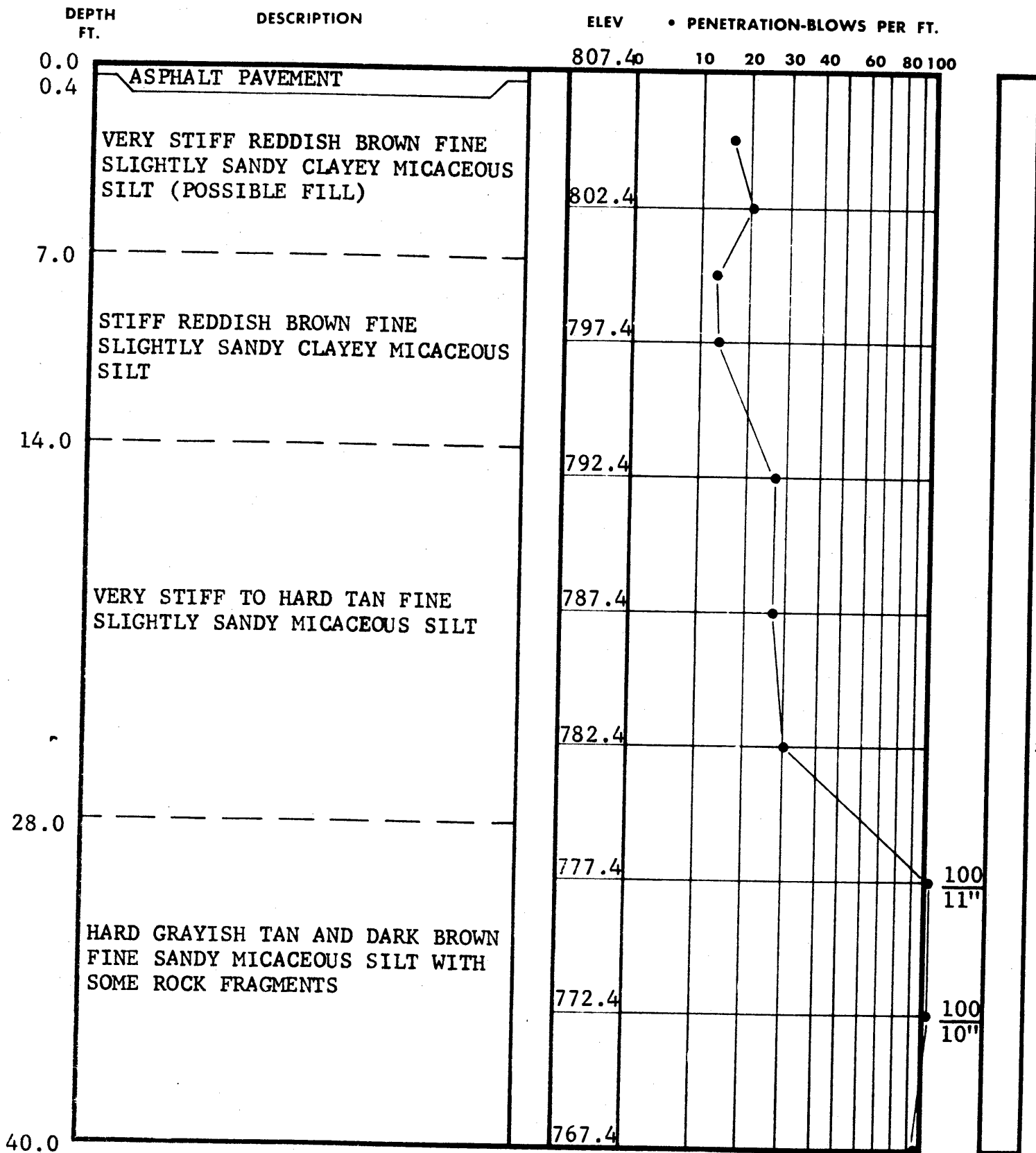
• **PENETRATION-BLOWS PER FT.**

NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

**LAW ENGINEERING TESTING CO.**





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 2

BORING NO. B-157

DATE DRILLED 9-27-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



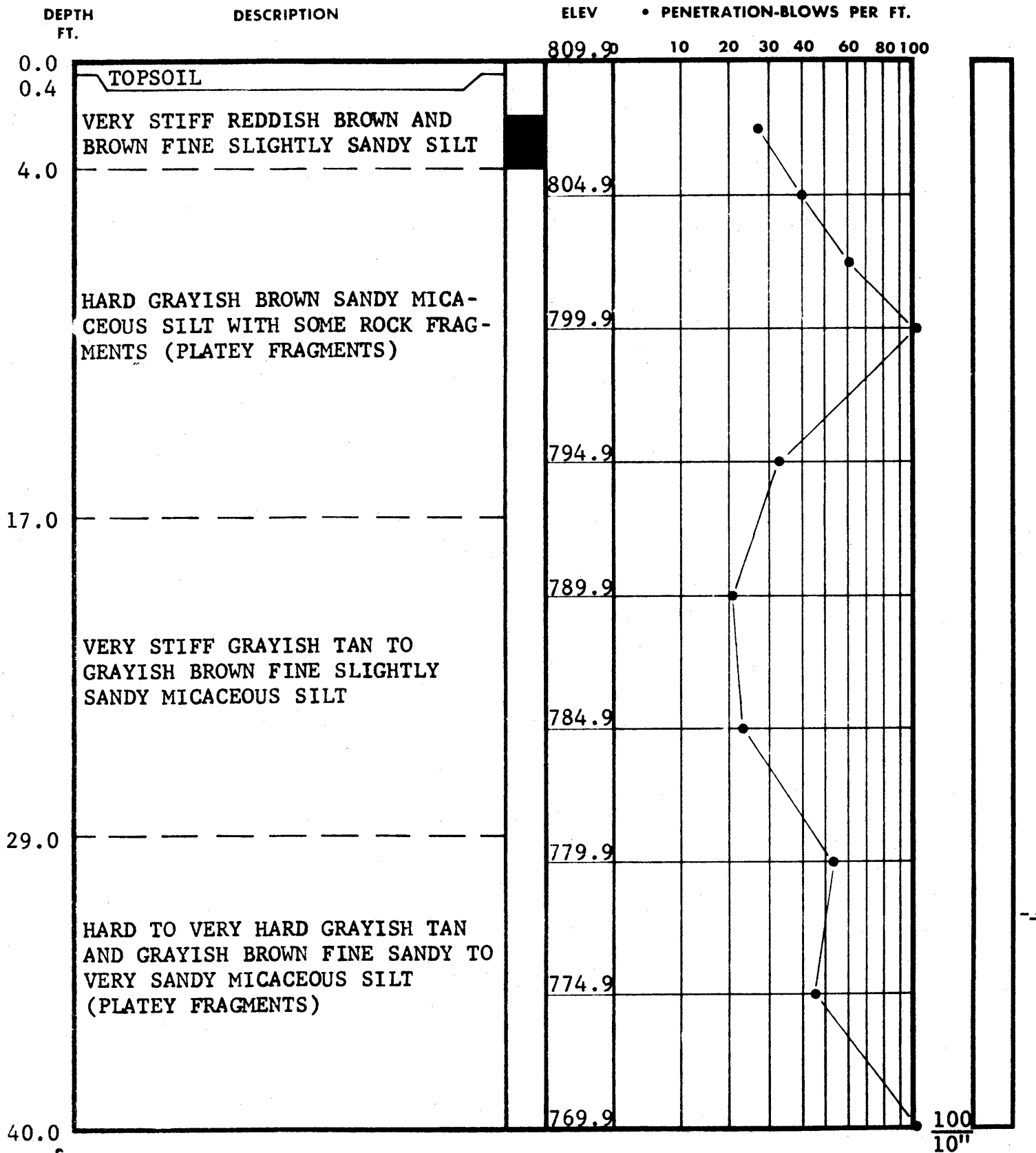
ELEV • PENETRATION-BLOWS PER FT.

**BORING TERMINATED**

762.4

**LAW ENGINEERING TESTING CO.**





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 1 of 2

BORING NO. B-158  
DATE DRILLED 9-27-68  
JOB NO. 5862

abc  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

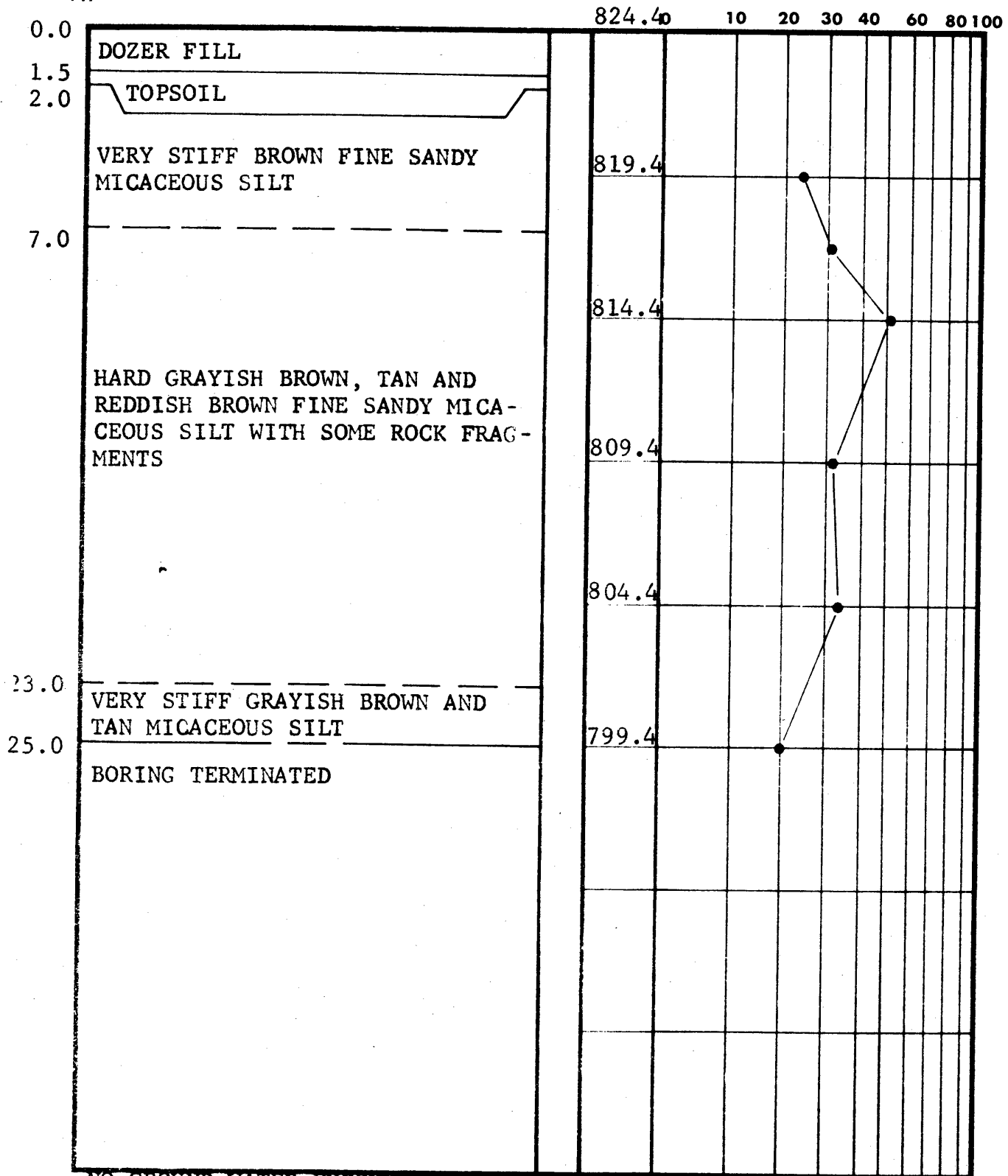
◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-159

DATE DRILLED 9-26-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

WATER TABLE, 24 HR.



WATER TABLE, 1 HR.

[50] °. ROCK CORE RECOVERY

### LOSS OF DRILLING WATER

**LAW ENGINEERING TESTING CO.**



831.00      10      20      30      40      60      80      100

0.0  
0.5

TOPSOIL

VERY STIFF TO HARD GRAYISH  
BROWN, REDDISH BROWN AND  
GRAYISH TAN FINE SANDY MICACEOUS  
SILT WITH OCCASIONAL BLACK SEAMS

12.5

VERY STIFF AND STIFF FINE  
SLIGHTLY SANDY TO SANDY MICA-  
CEOUS SILT

25.0

BORING TERMINATED

826.0

821.0

816.0

811.0

806.0

NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-160

DATE DRILLED 9-26-68

JOB NO. 5862

abc  UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 MB.

50 % ROCK CORE RECOVERY

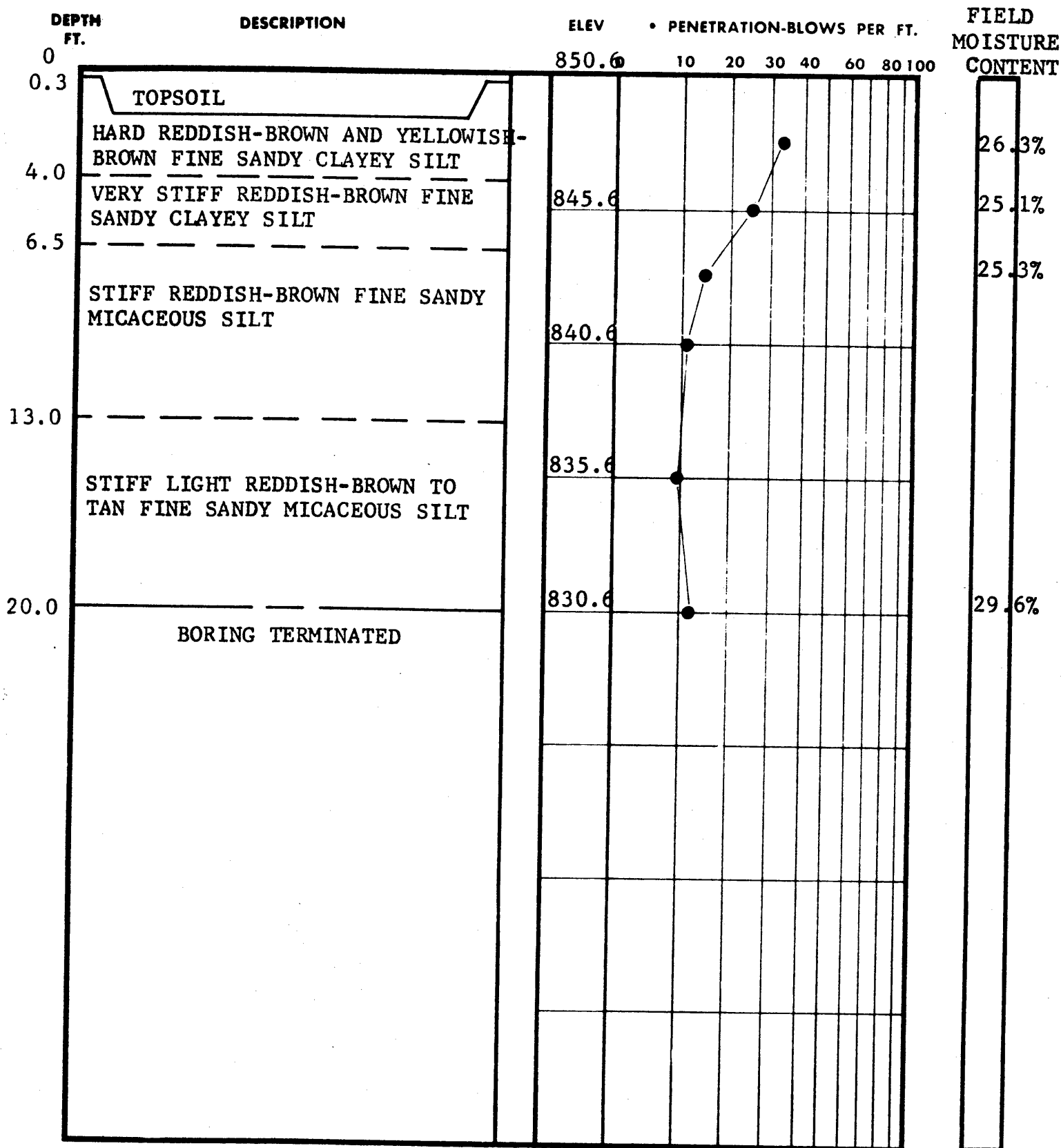
LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



**LAW ENGINEERING TESTING CO.**





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-201

DATE DRILLED 7/23/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

[30] % ROCK CORE RECOVERY

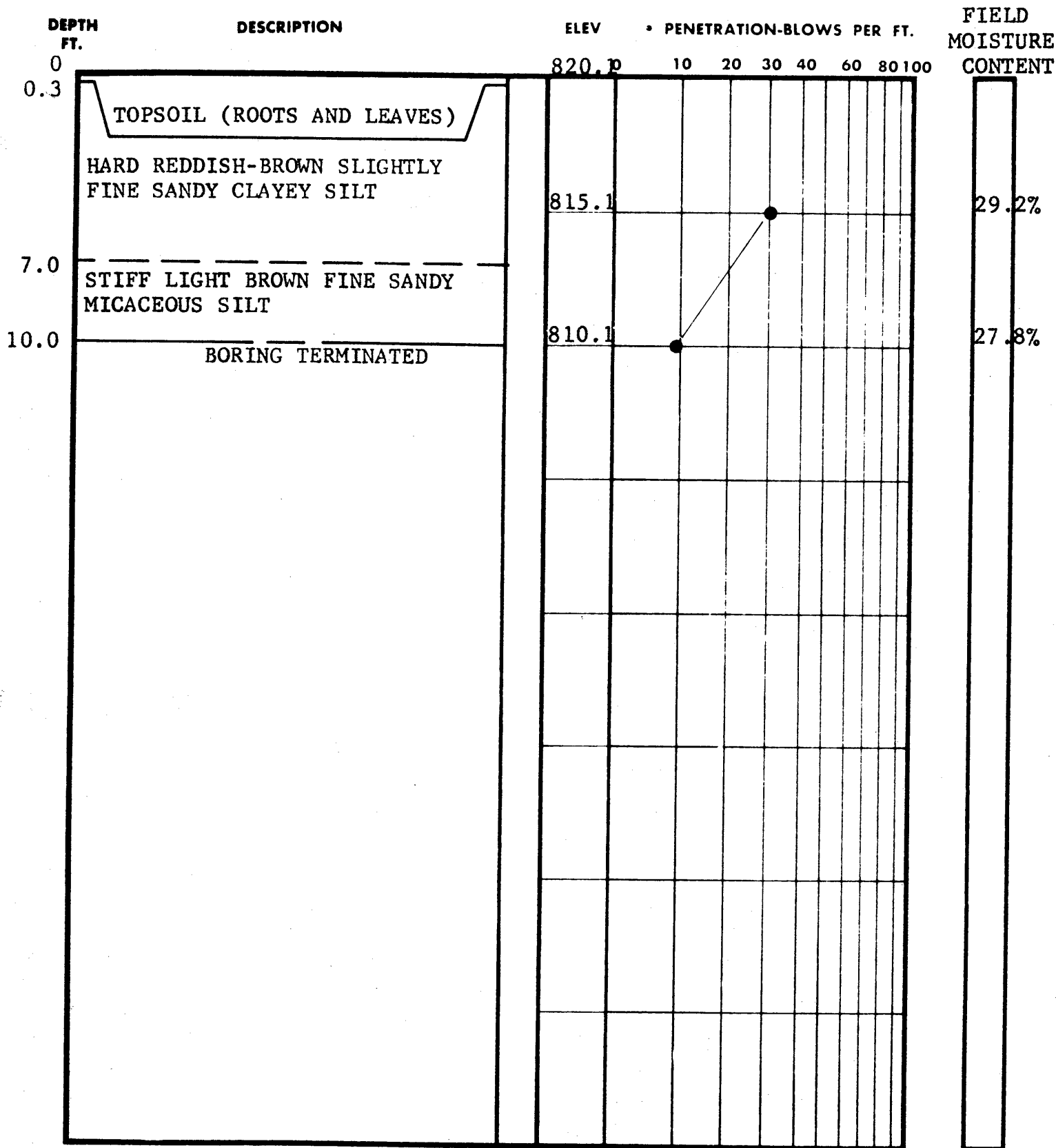
 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.









NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-203

DATE DRILLED 7/3/68

JOB NO. 5862

jj



UNDISTURBED SAMPLE



WATER TABLE, 24 HR.



WATER TABLE, 1 HR.

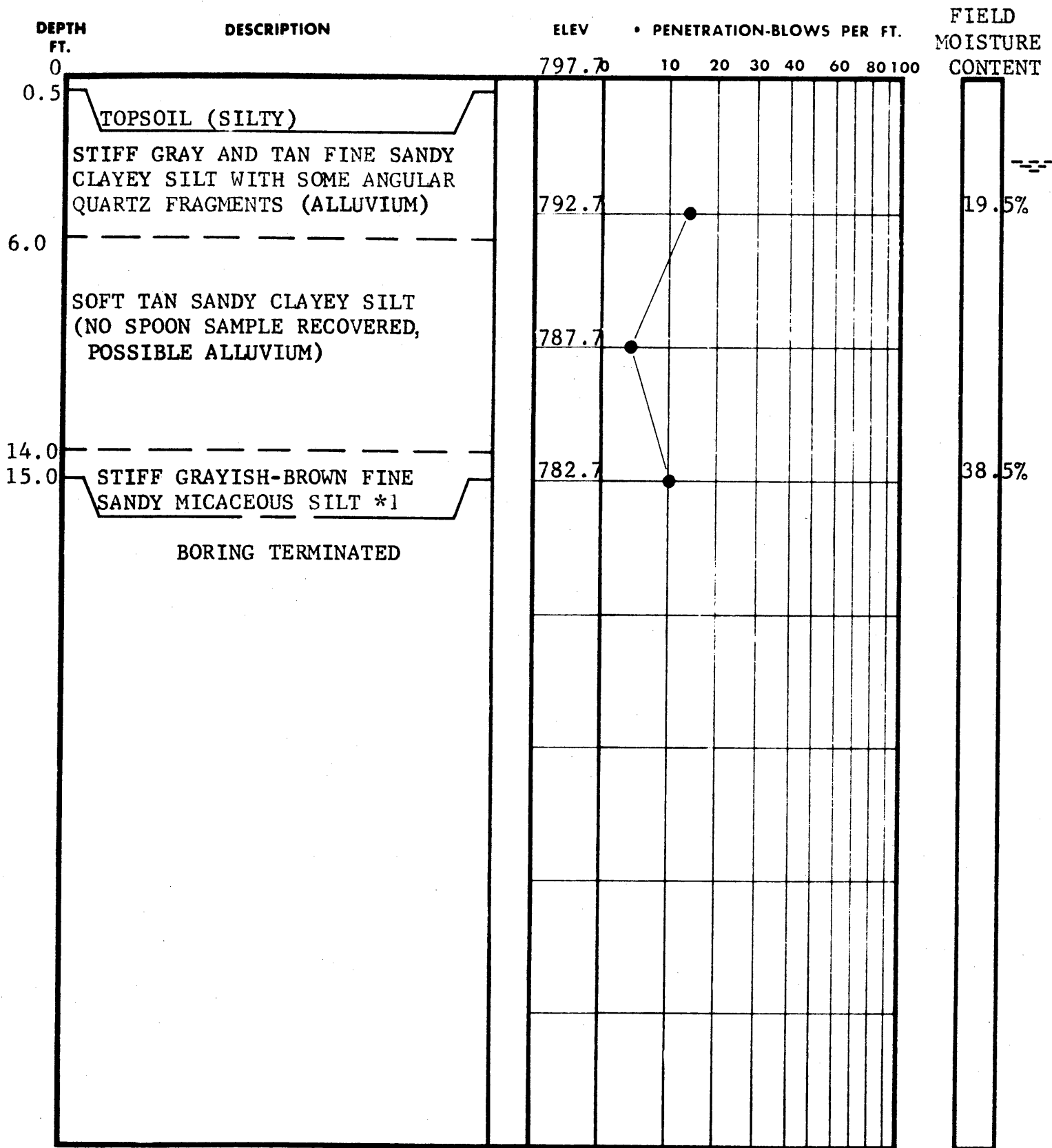
[50] % ROCK CORE RECOVERY



LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





\*1 (PLATEY FRAGMENTS)

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-204

DATE DRILLED 7/31/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

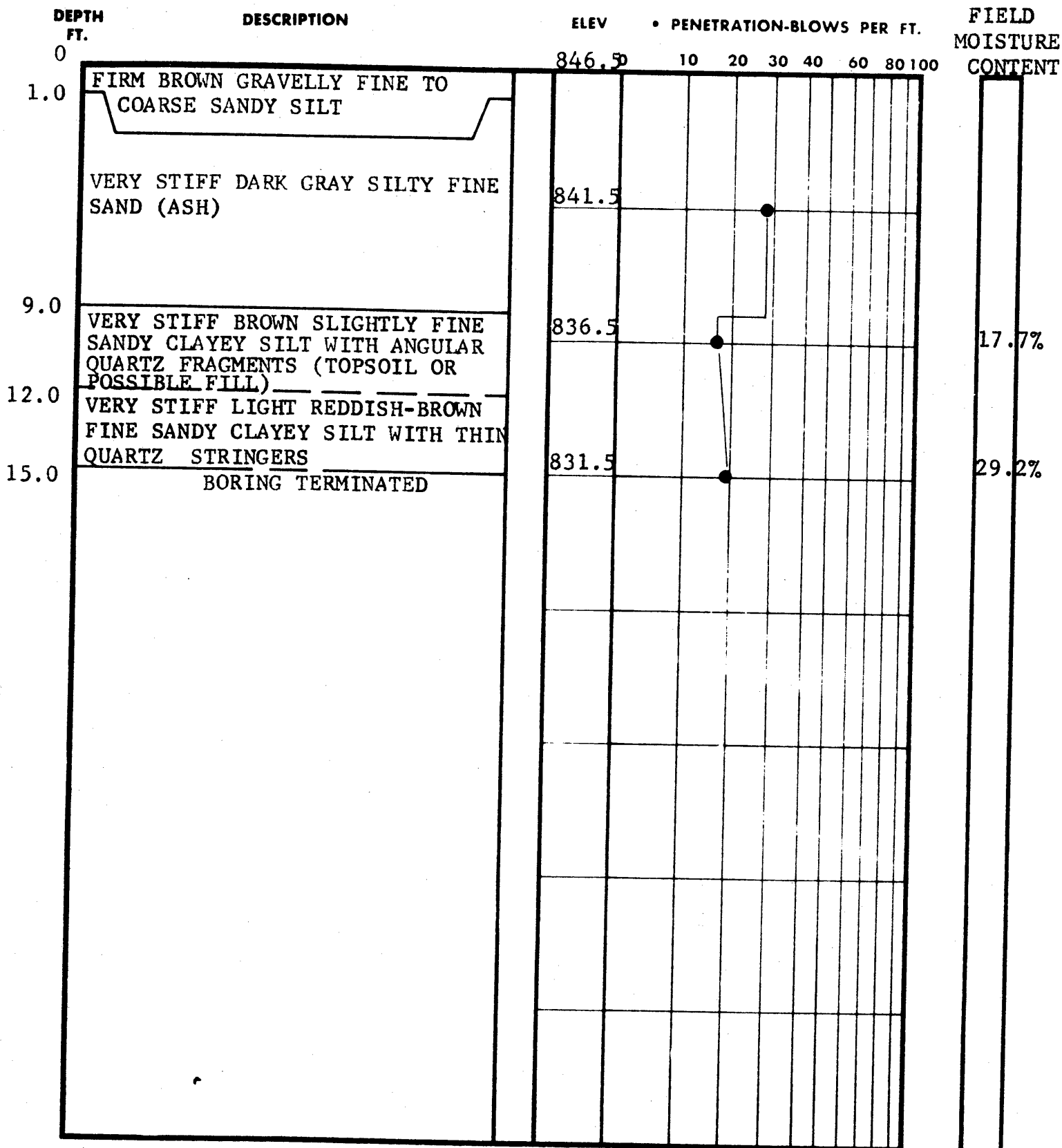
 WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-205

DATE DRILLED 7/31/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

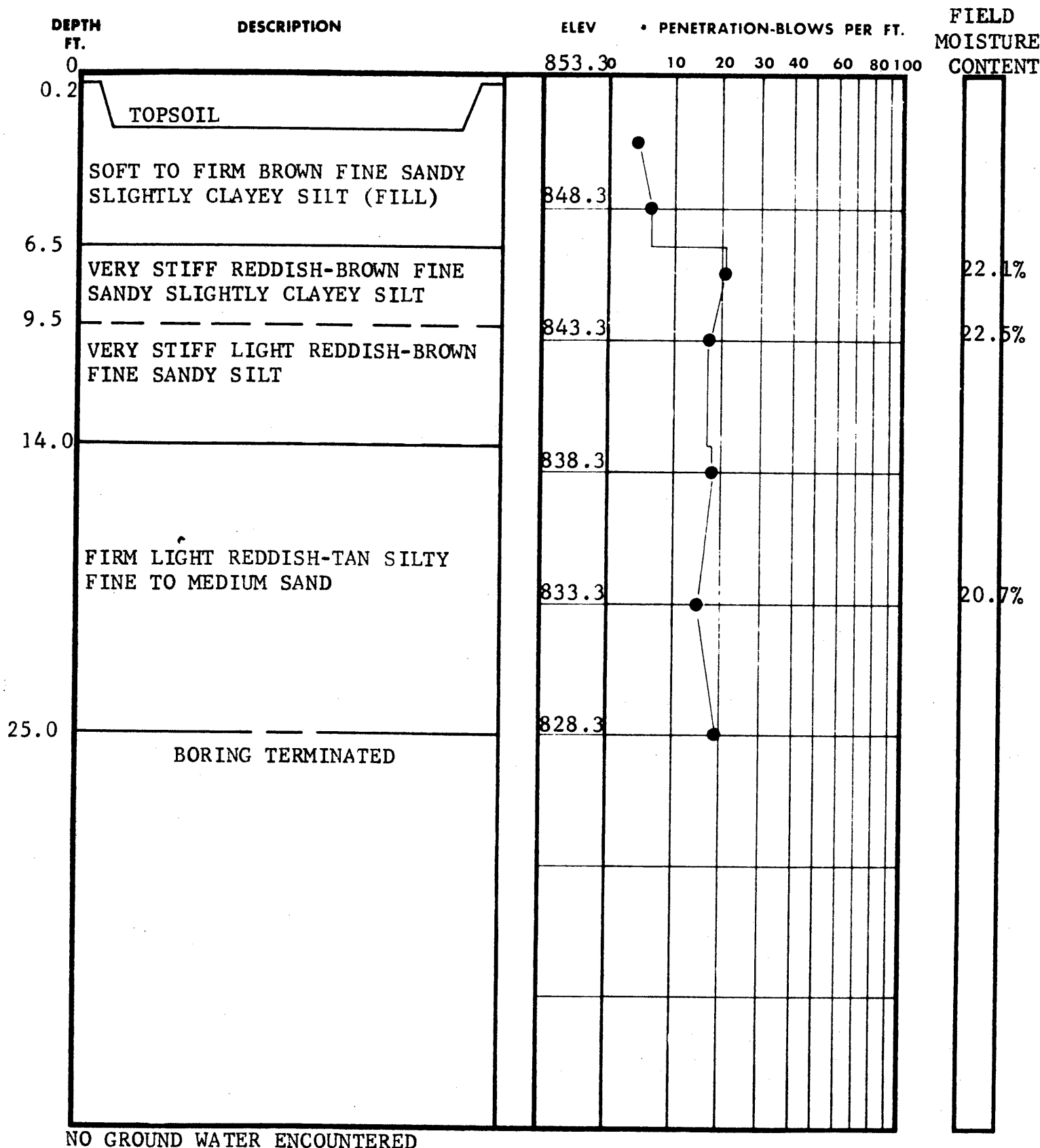
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-206  
DATE DRILLED 7/22/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

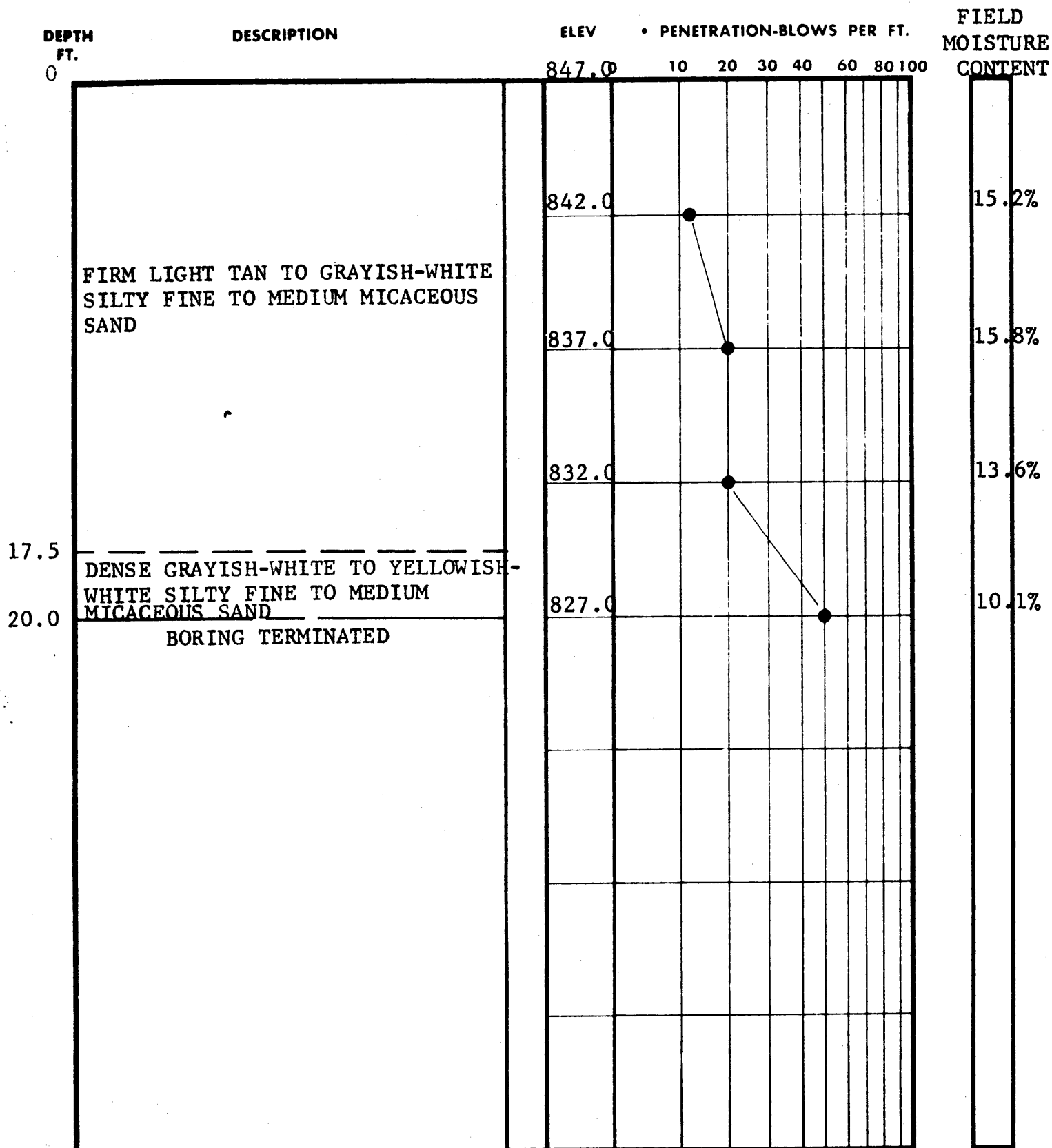
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-207

DATE DRILLED 7/24/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 50% ROCK CORE RECOVERY

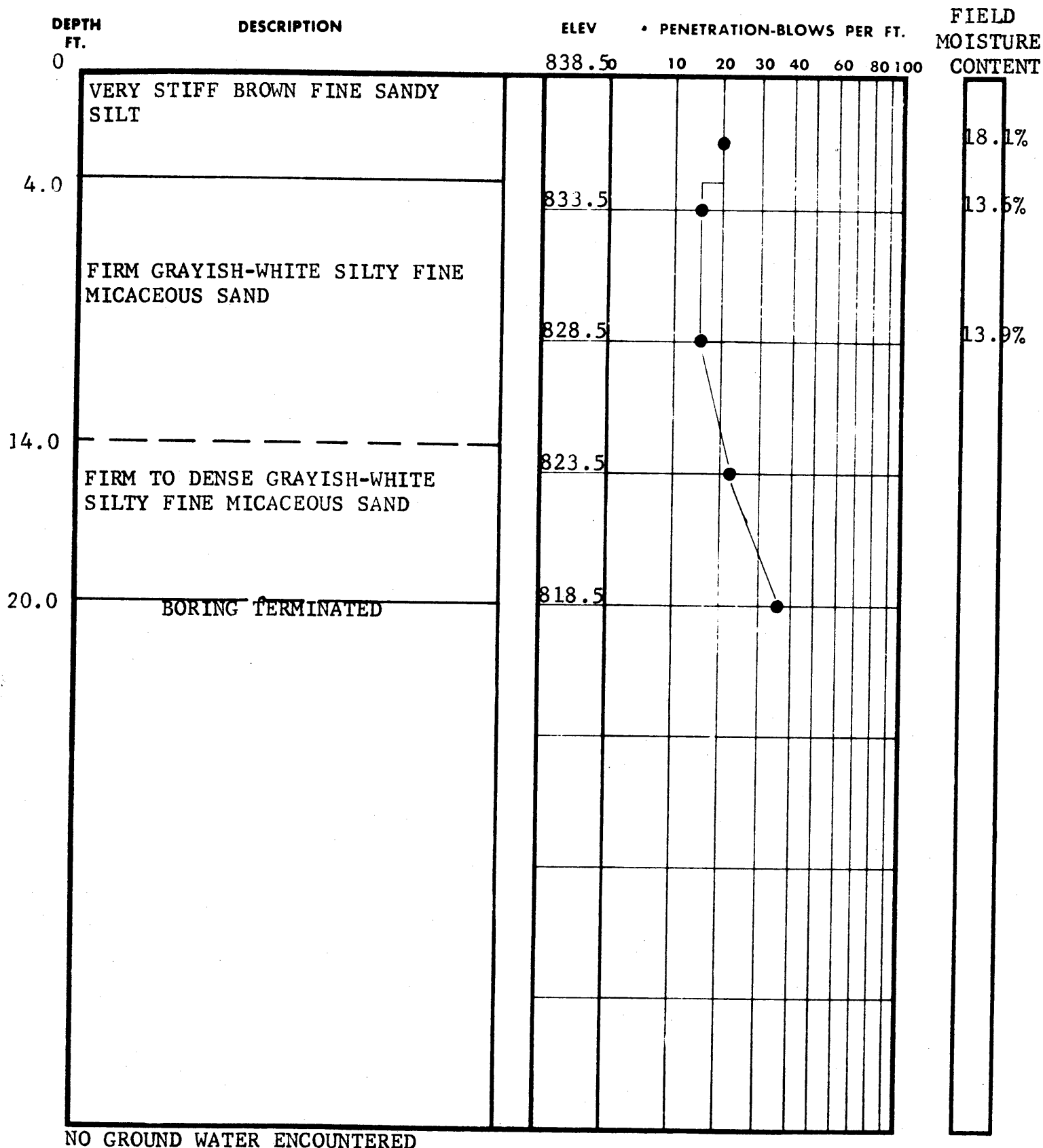
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-208

DATE DRILLED 7/24/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

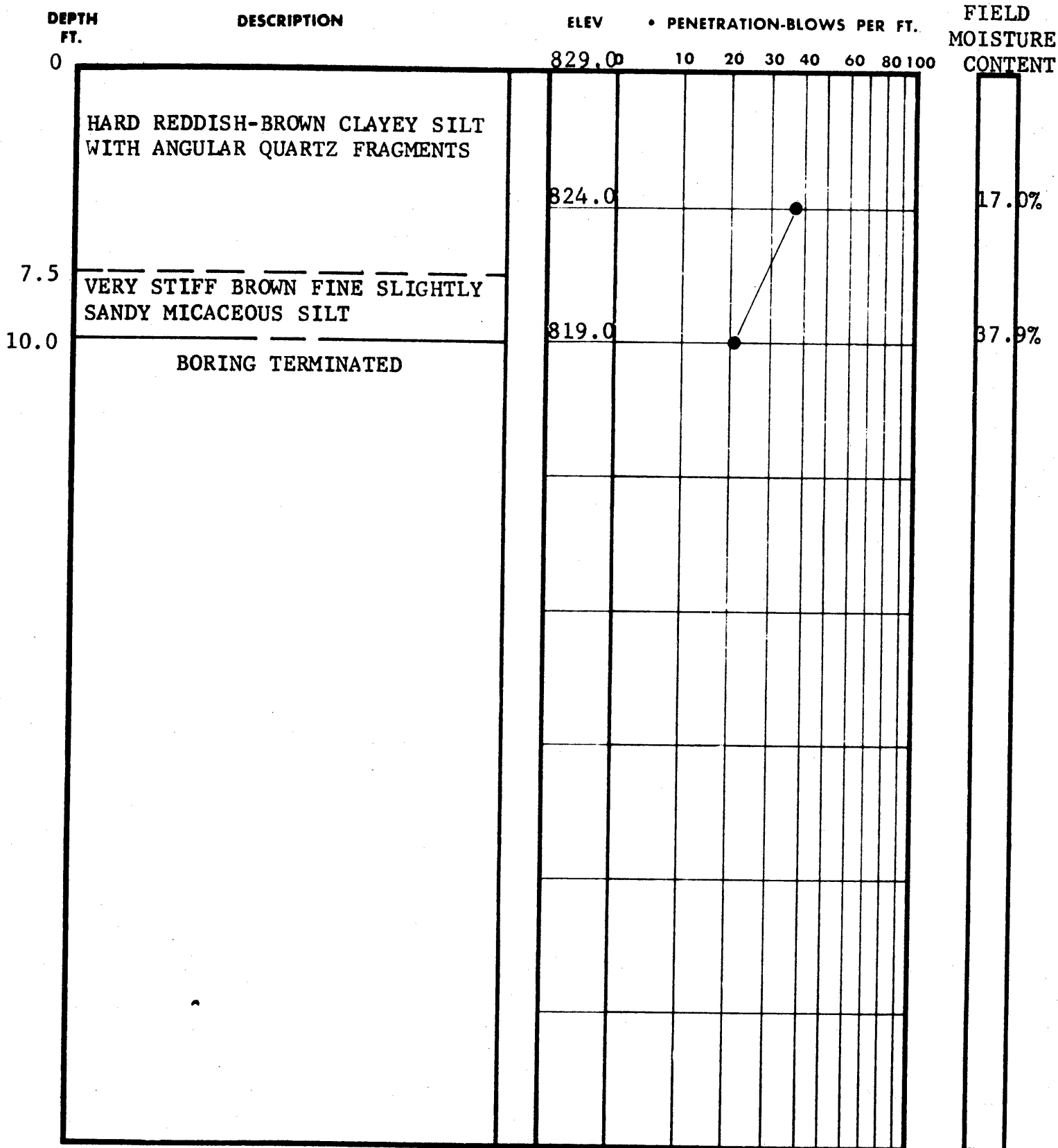
LAW ENGINEERING TESTING CO.



NO GROUND WATER ENCOUNTERED

**LAW ENGINEERING TESTING CO.**





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-210

DATE DRILLED 7/31/68

JOB NO. 5862

11  UNDISTURBED SAMPLE

50  % ROCK CORE RECOVERY

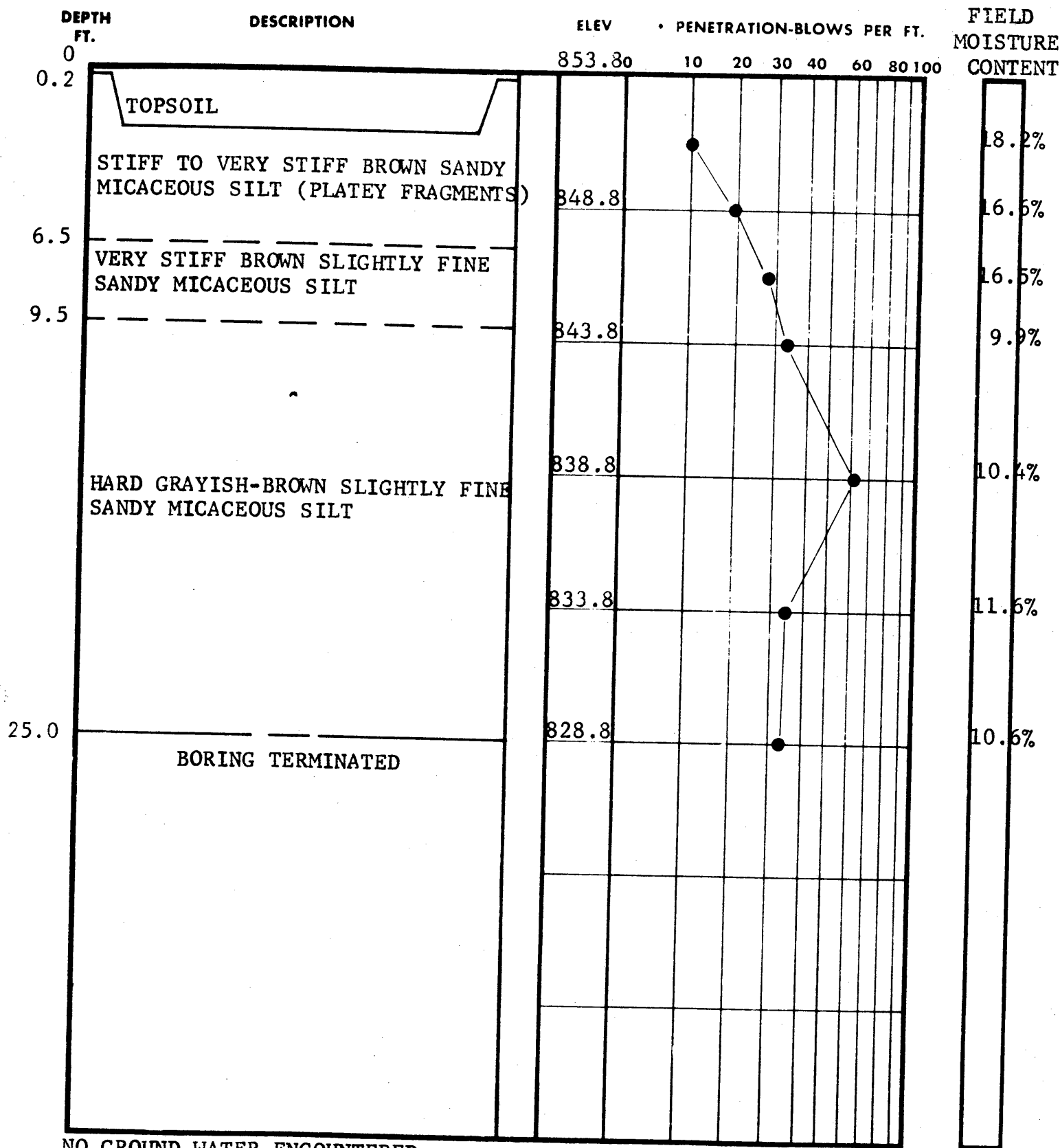
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-211

DATE DRILLED 7/22/68

JOB NO. 5862

jj



UNDISTURBED SAMPLE



WATER TABLE, 24 HR.



WATER TABLE, 1 HR.

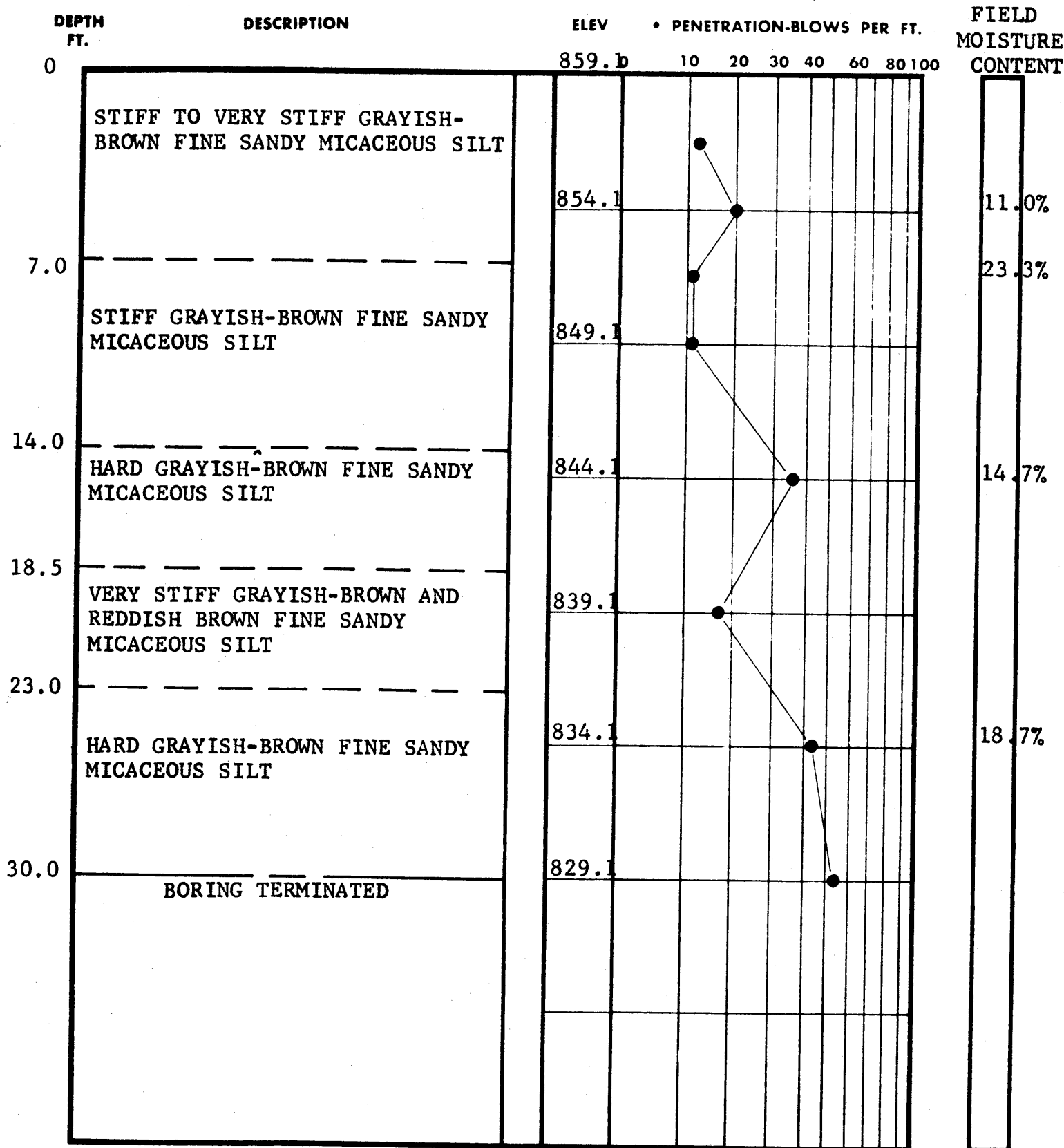
[50] % ROCK CORE RECOVERY



LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-212  
DATE DRILLED 7/23/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

| 50 | % ROCK CORE RECOVERY

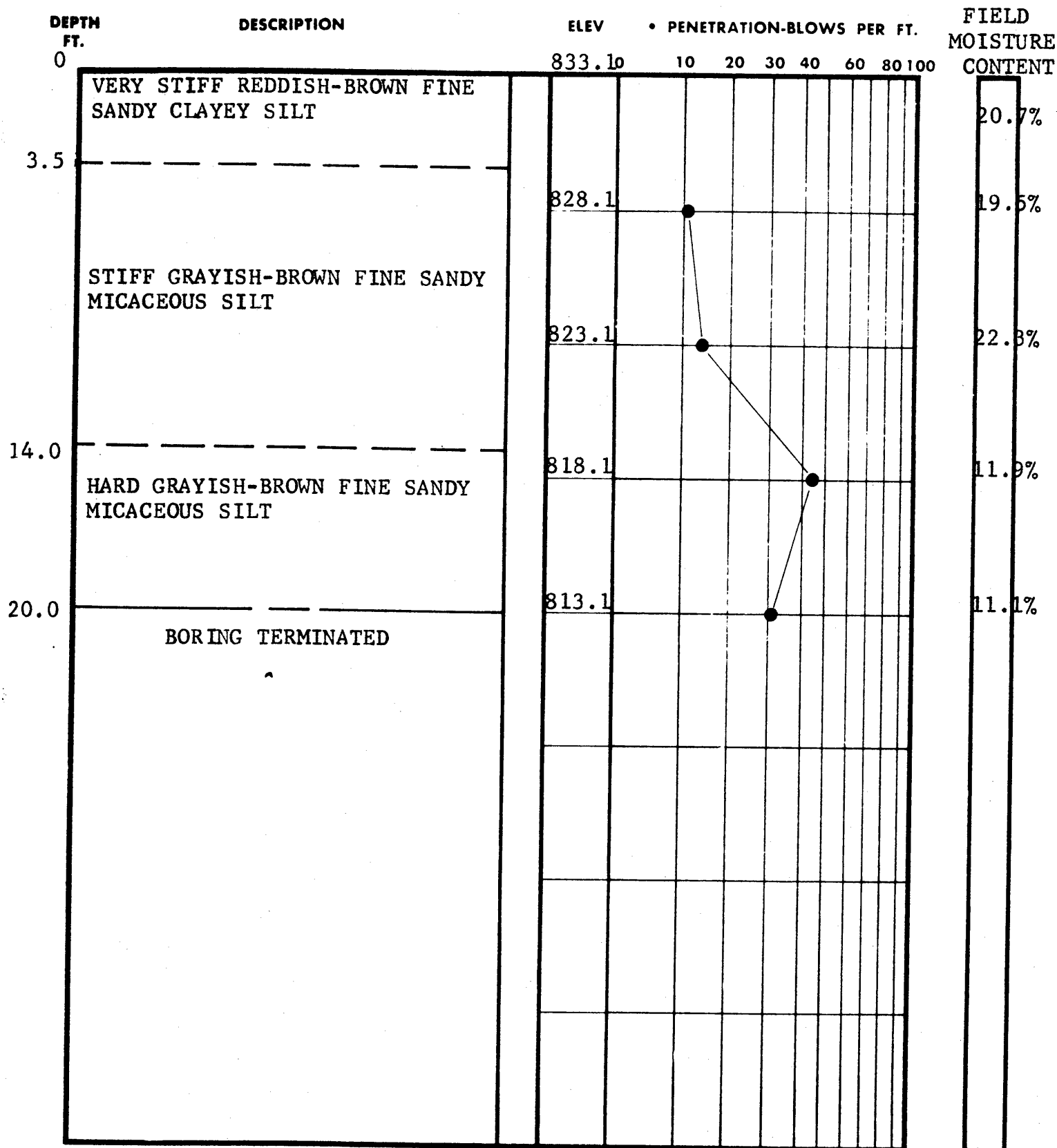
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-213

DATE DRILLED 7/22/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

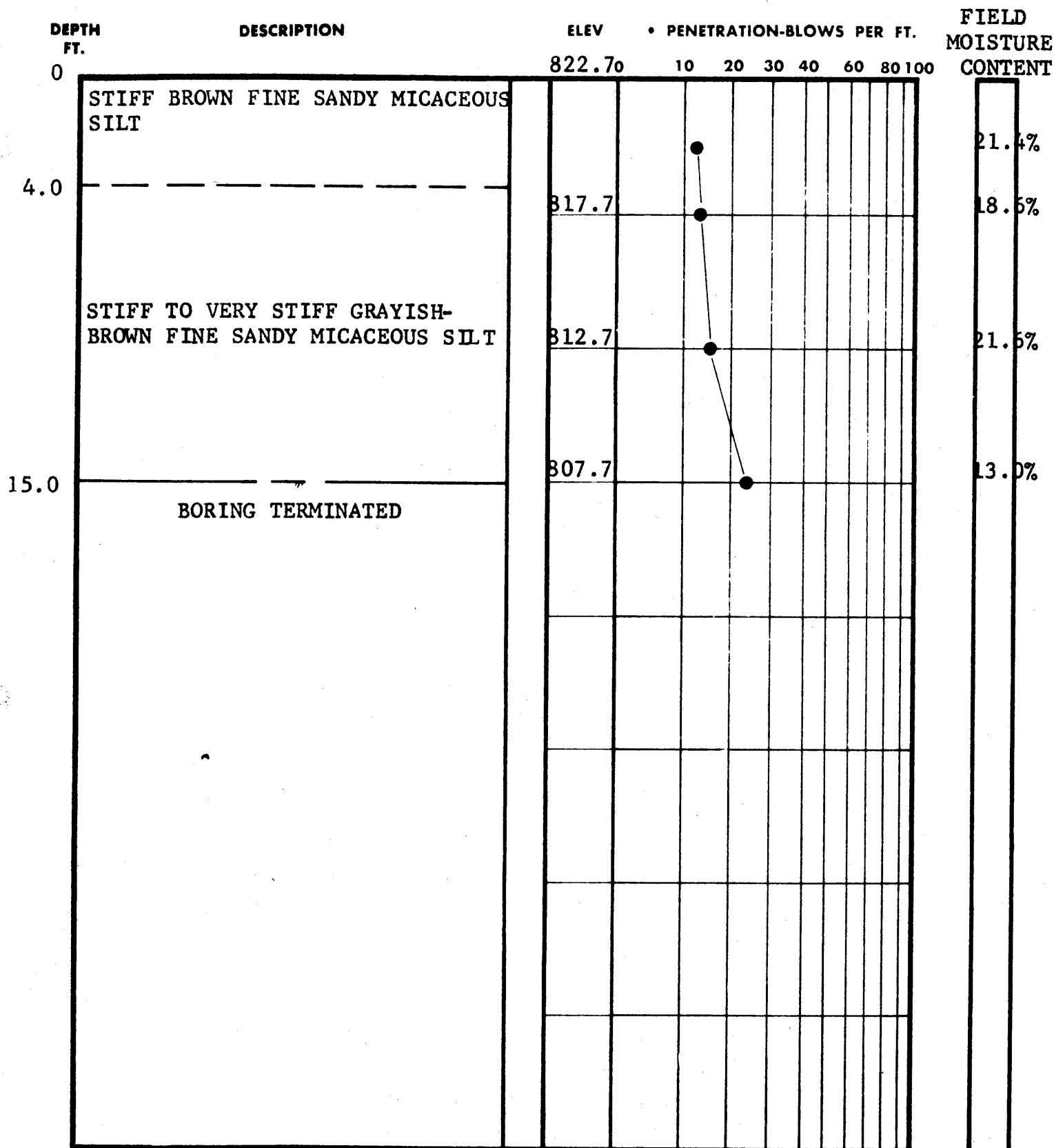
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-214

DATE DRILLED 7/24/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

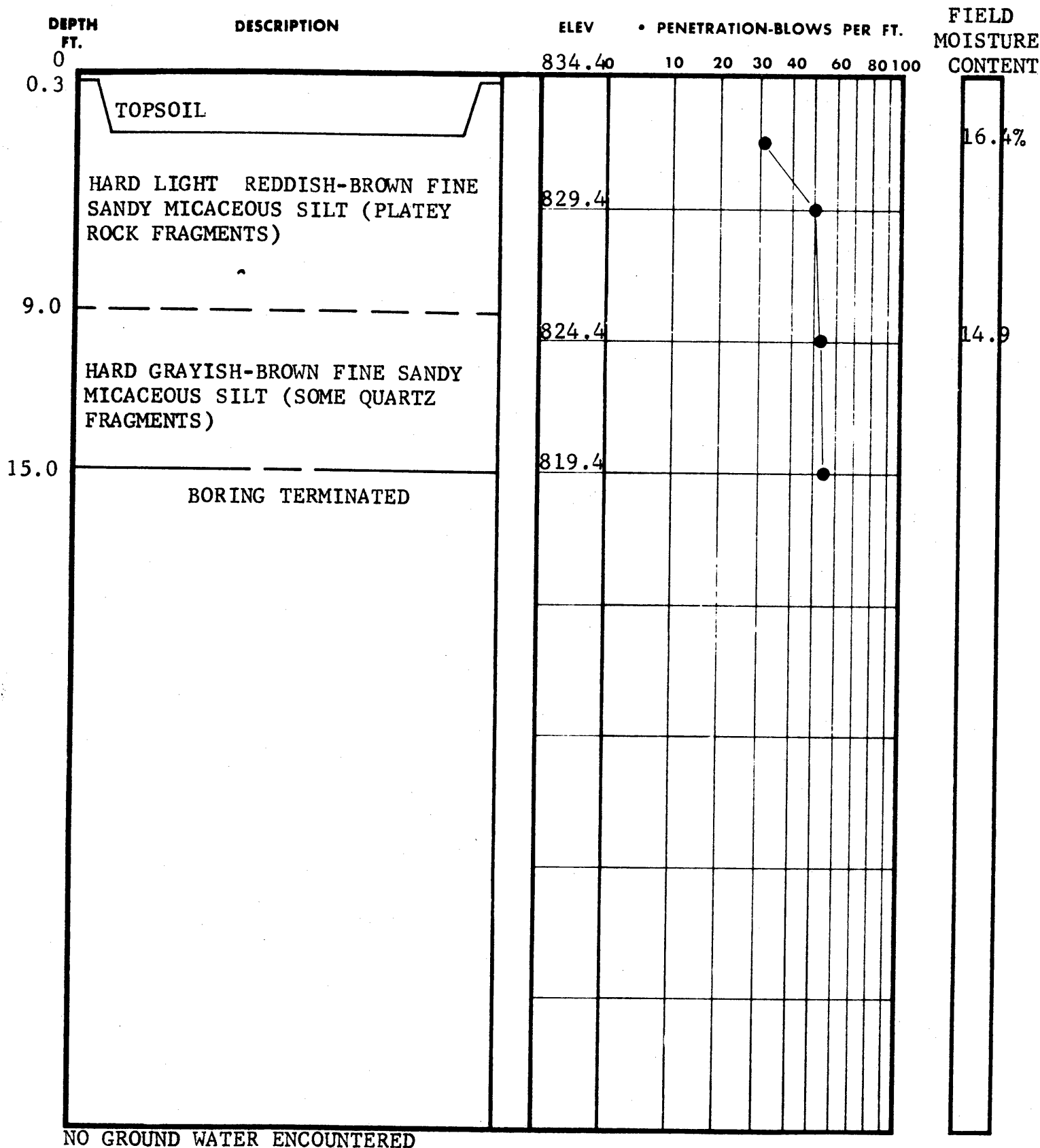
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-215

DATE DRILLED 7/25/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

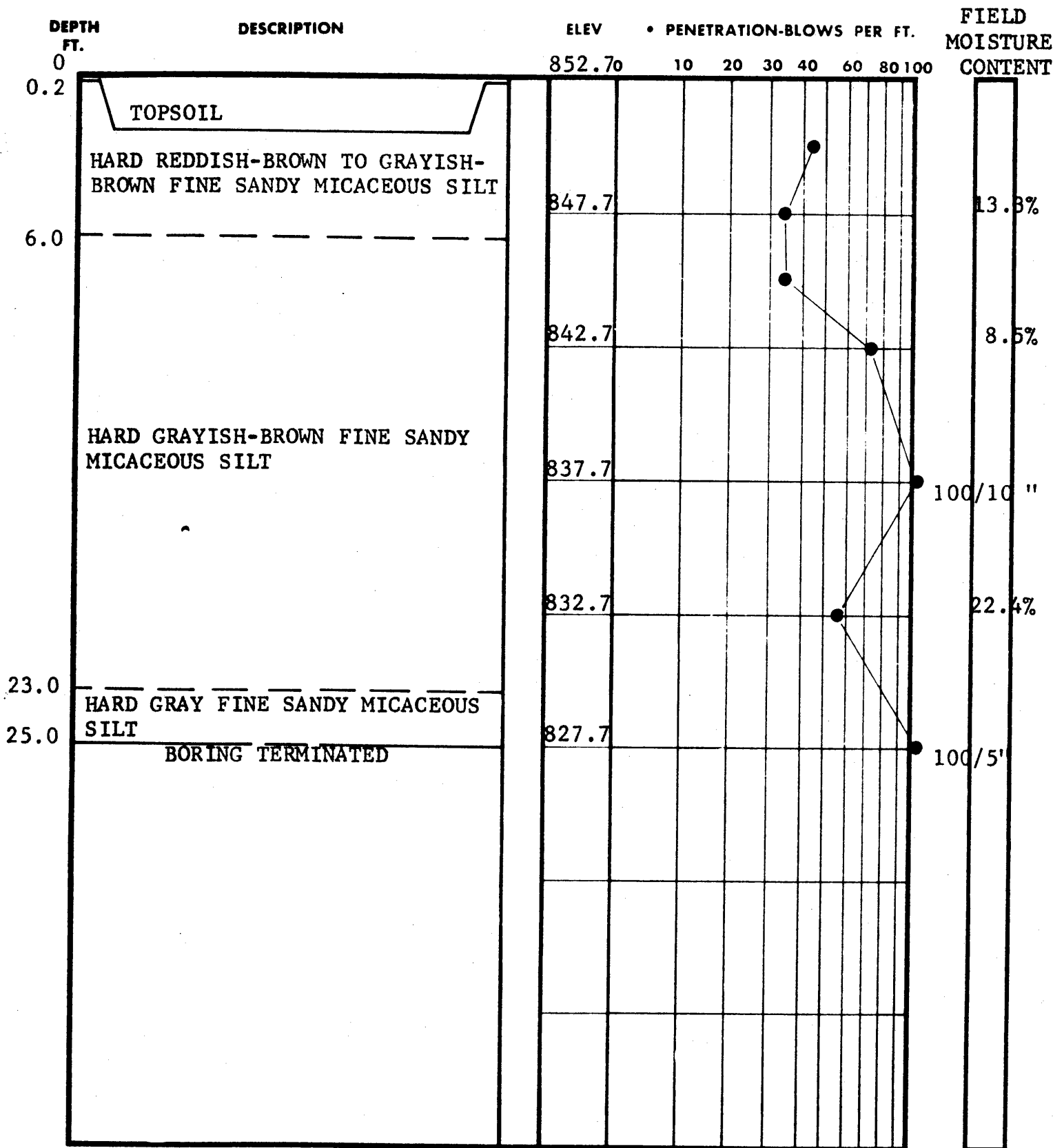
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-216  
DATE DRILLED 7/22/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 % ROCK CORE RECOVERY

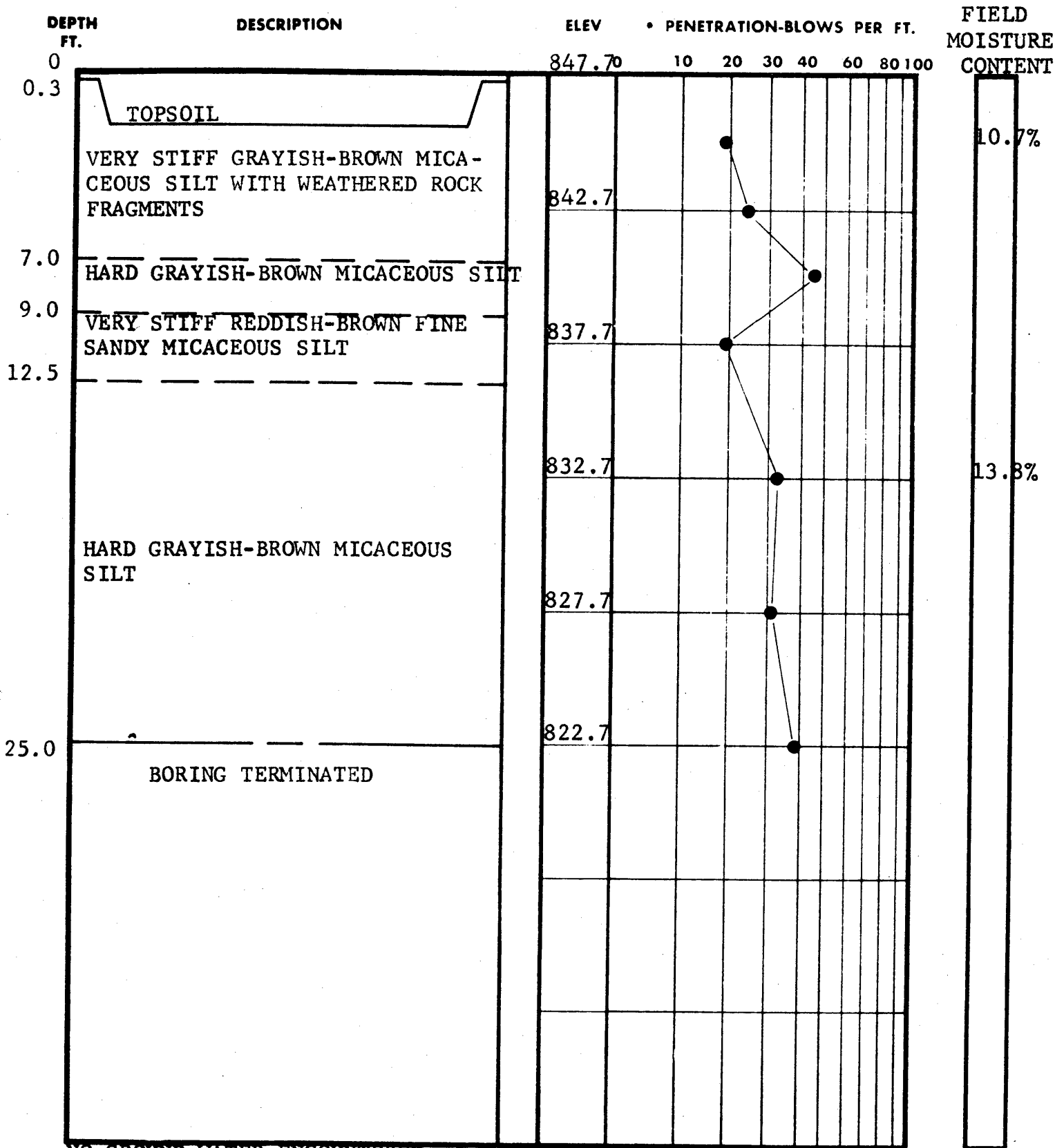
 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-217  
DATE DRILLED 7/23/68  
JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

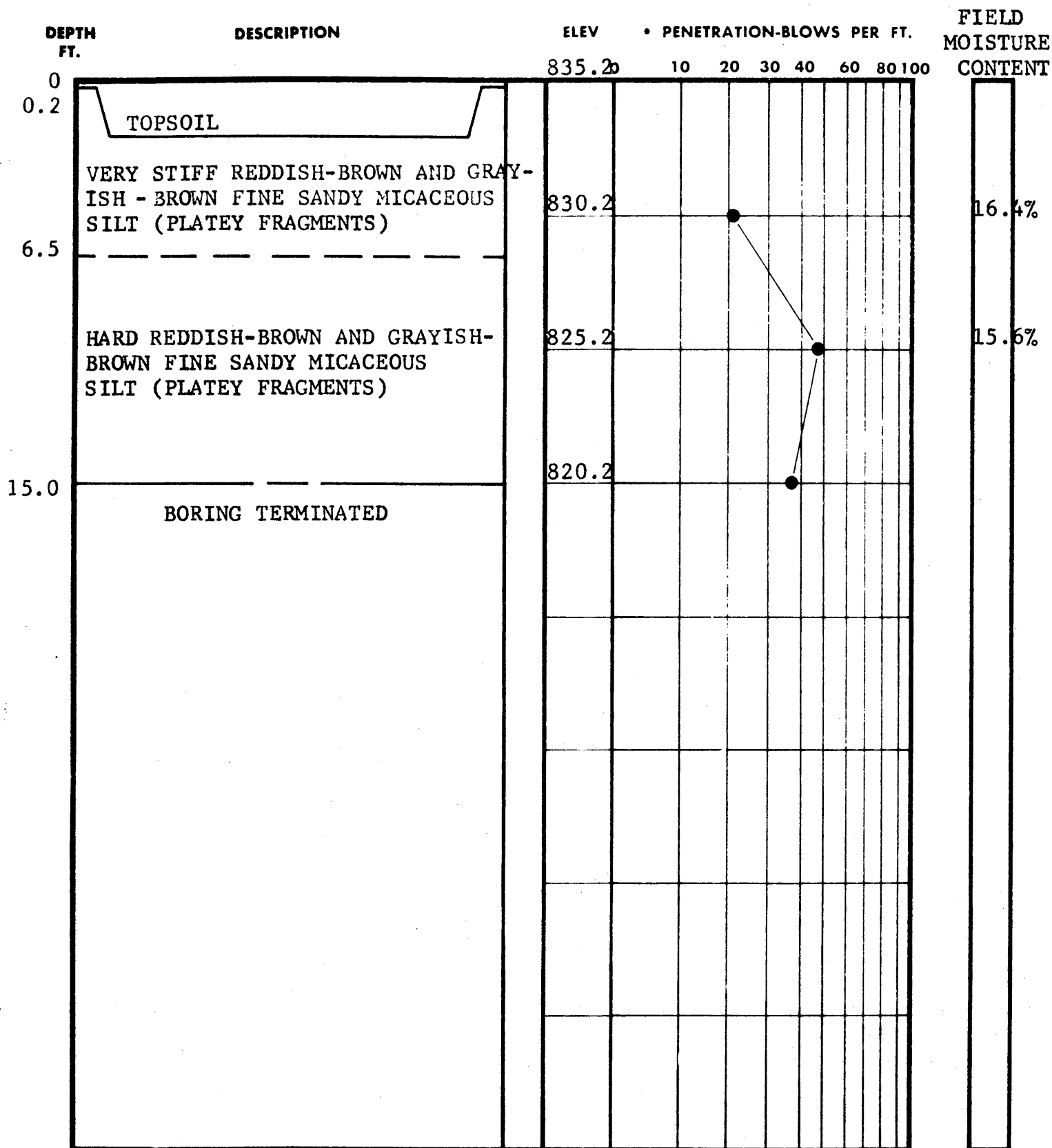
 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.














NO GROUND WATER ENCOUNTERED

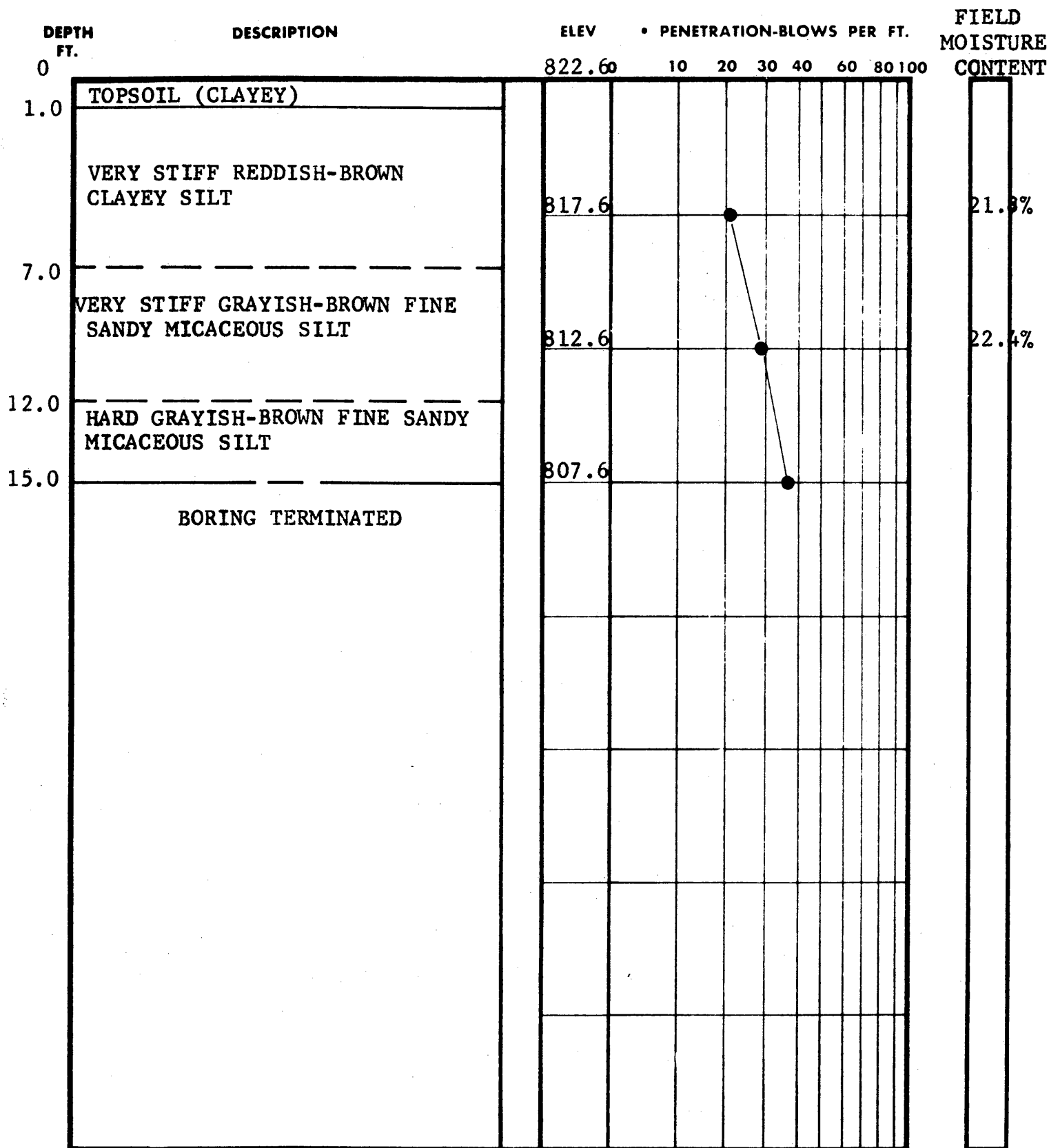
TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-219  
DATE DRILLED 7/24/68  
JOB NO. 5862

jj  UNDISTURBED SAMPLE  
 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.  
 30% ROCK CORE RECOVERY  
 LOSS OF DRILLING WATER





NO GROUND WATER ENCOUNTERED

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-220

DATE DRILLED 7/30/68

JOB NO. 5862

jj

 UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

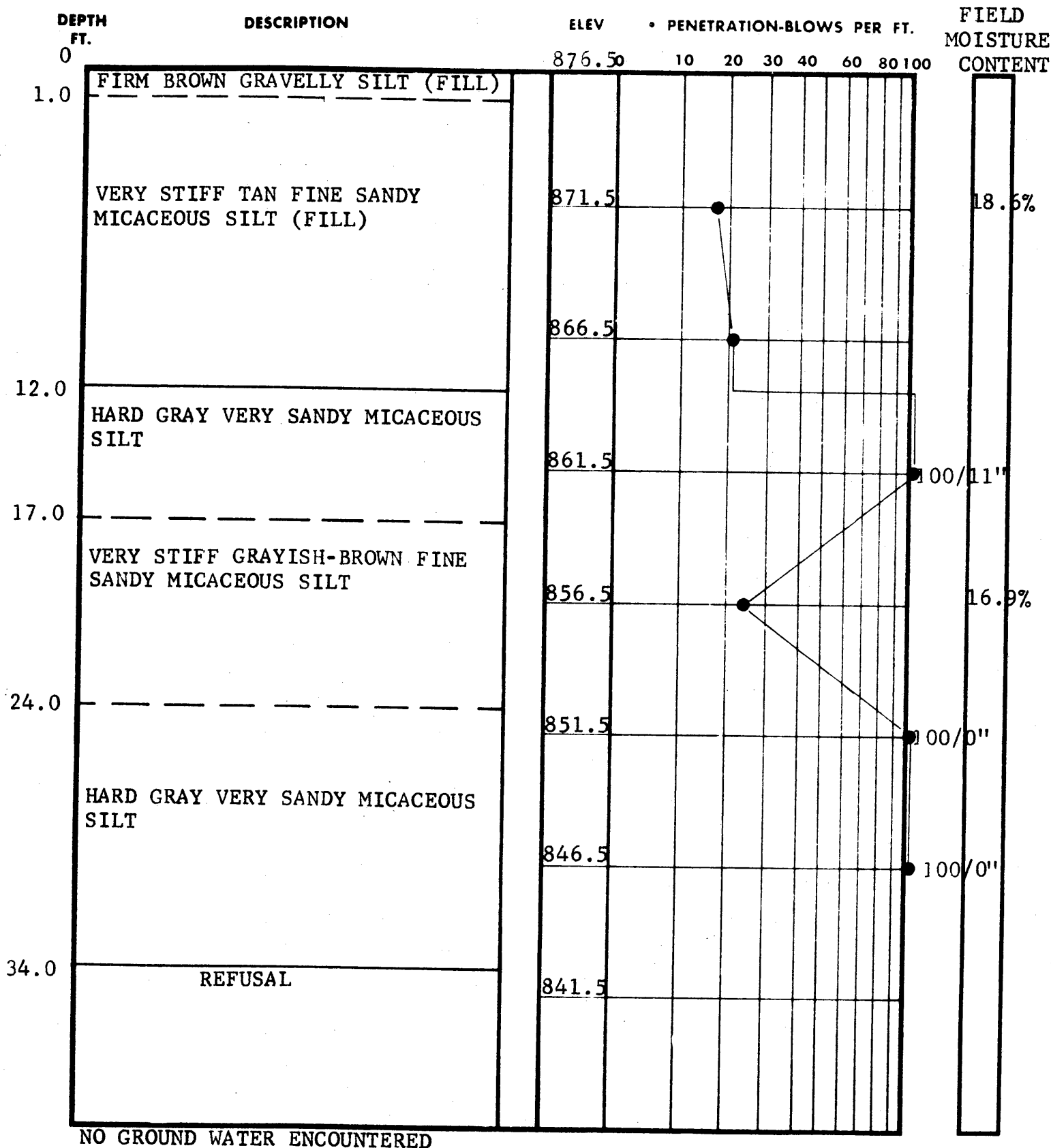
 WATER TABLE, 1 HR.

 % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-221  
DATE DRILLED 8/1/68  
JOB NO. 5862

jj

UNDISTURBED SAMPLE

[50] % ROCK CORE RECOVERY

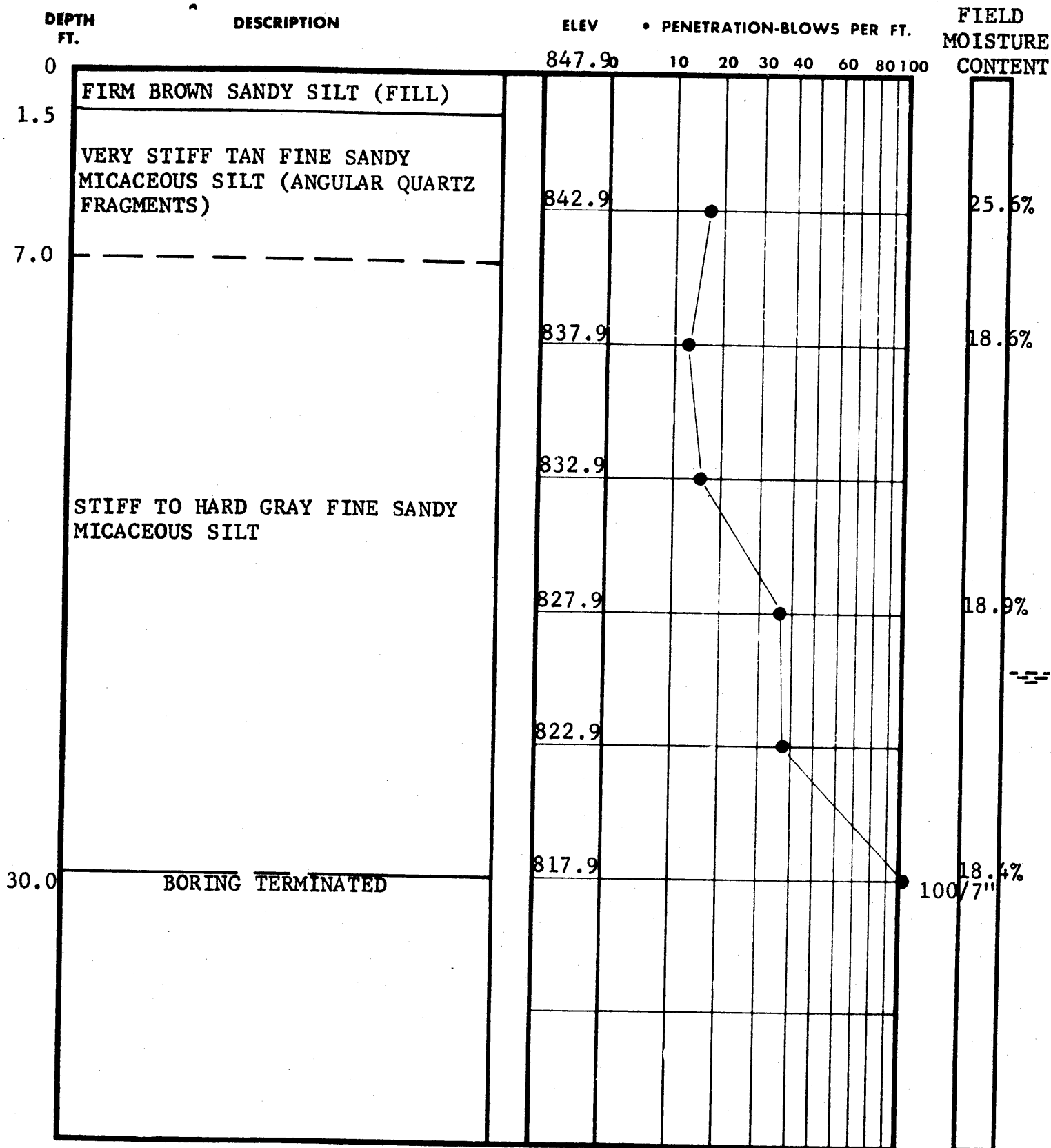
WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-222

DATE DRILLED 8/1/68

JOB NO. 5862

jj



UNDISTURBED SAMPLE



WATER TABLE, 24 HR.



WATER TABLE, 1 HR.

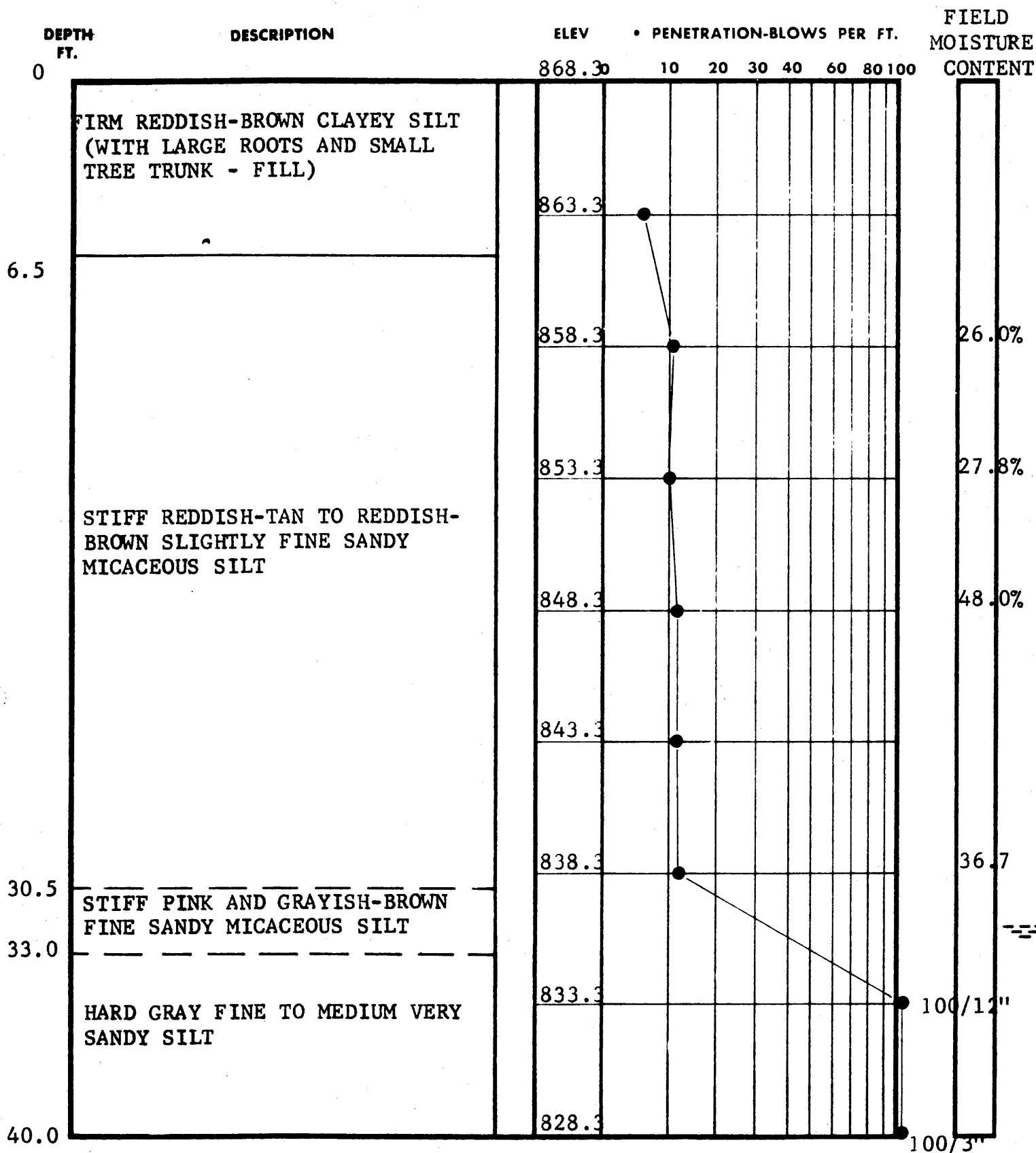
[50] % ROCK CORE RECOVERY



LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.





## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-223

DATE DRILLED 7/31/68

JOB NO. 5862

jj  UNDISTURBED SAMPLE

 WATER TABLE, 24 HR.

 WATER TABLE, 1 HR.

PAGE 1 of 2

[50] % ROCK CORE RECOVERY

 LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.



• PENETRATION-BLOWS PER FT.

10 20 30 40 60 80 100

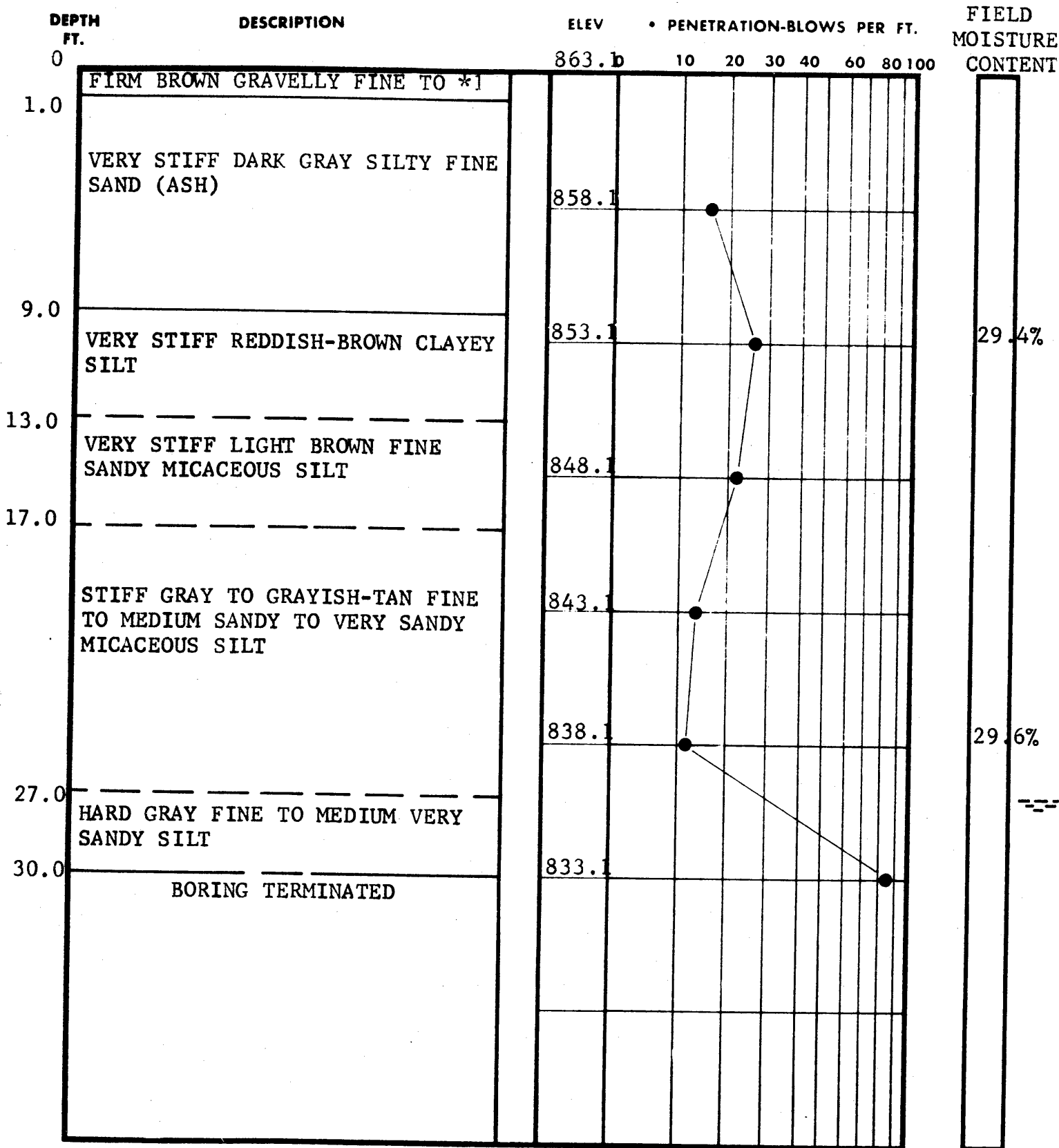
100√3"

BORING TERMINATED

823.3

◀ **LOSS OF DRILLING WATER**





\*1 COARSE SANDY SILT (FILL)

## TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113  
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. B-224  
DATE DRILLED 7/31/68  
JOB NO. 5862

jj  UNDISTURBED SAMPLE

[50] % ROCK CORE RECOVERY

 WATER TABLE, 24 HR.  
 WATER TABLE, 1 HR.

 LOSS OF DRILLING WATER



## Piezometer Log

Southern Company

DATE INSTALLED: <b>8-23-05</b>		DATE DEVELOPED: <b>8-23-05</b>		WELL NO.: <b>10 C</b>	
EWO #		PROJECT: <b>McDonough</b>		LOCATION: <b>Ash Pond</b>	
PREPARED BY: <b>B. Filipovich</b>		REFERENCE POINT FOR MEASUREMENTS: <b>Ground Level</b>			

	Depth ft.	Elevation
ELEV. TOP OF SURFACE CASING →		
ELEV. TOP OF RISER CASING →	<b>+35.5'</b>	
GROUND SURFACE →	<b>0.0</b>	
CONCRETE		
SURFACE CASING DIA: <b>4x4"x5'</b> TYPE: <b>Steel</b>		
BOTTOM OF SURFACE CASING →	<b>2'</b>	
BACKFILL MATERIAL TYPE: <b>5/8" Bentonite Chips</b>		
RISER CASING DIA: <b>2"</b> TYPE: <b>DSI 480</b>		
TOP OF SEAL		
1/4" ANNULAR SEAL TYPE: <b>Bentonite Pellets</b>	<b>71.5'</b>	
TOP OF FILTER PACK →	<b>73.8'</b>	
FILTER PACK TYPE: <b>#2 Sand</b>		
TOP OF SCREEN →	<b>89.4'</b>	
DIA: <b>2"</b> SCREEN: TYPE: <b>DSI</b> OPENINGS - WIDTH: <b>.010</b> TYPE: <b>Slotted</b>		
BOTTOM OF SCREEN →	<b>99.4'</b>	
BOTTOM OF SUMP →	<b>99.7'</b>	
BOTTOM OF HOLE →	<b>99.7'</b>	

∇ - DEPTH TO GROUNDWATER (from reference)  
 DATE - **8-25-05**  
 DEPTH - **56.15'**  
 REMARKS:  
**10A**  
**water table**  
**63.56'**

NOTE:  
 Depths below ground surface are positive.

HOLE DIA: **7 5/8" IN.**

Remarks:



## Piezometer Log

Southern Company

DATE INSTALLED: 8-23-05		DATE DEVELOPED: 8-23-05		WELL NO.: 8-B	
EWO #		PROJECT: McDonough Wells		LOCATION: Ash Pond	
PREPARED BY: B. Filipovich		REFERENCE POINT FOR MEASUREMENTS: Ground Level			

	Depth ft.	Elevation
ELEV. TOP OF SURFACE CASING		
ELEV. TOP OF RISER CASING	37.5'	
GROUND SURFACE	0.0	
CONCRETE		
SURFACE CASING DIA: TYPE:		
BOTTOM OF SURFACE CASING	2'	
BACKFILL MATERIAL TYPE: Bentonite Chips		
RISER CASING DIA: 2" PVC TYPE: DSI		
TOP OF SEAL		
ANNULAR SEAL TYPE: 1/4" Bentonite Pellets	14.1'	
TOP OF FILTER PACK	16.8'	
FILTER PACK TYPE: #2 Sand		
TOP OF SCREEN	19.7'	
SCREEN DIA: 2" SCREEN: TYPE: DSI OPENINGS - WIDTH: .010 TYPE: Slotted		
BOTTOM OF SCREEN	24.7'	
BOTTOM OF SUMP	25'	
BOTTOM OF HOLE	25'	

Σ - DEPTH TO GROUNDWATER (from reference)

DATE - 8-25-05

DEPTH - 5.06'


REMARKS:

NOTE: Depths below ground surface are positive.

HOLE DIA: 2 5/8" IN.

Remarks:



Field Test Boring Record  
Geotechnical Field ServicesSouthern Company Services 

PROJECT		Plant Mc Donah		EWO #		LEAD DRILLER		B.F.		DATE		8-22-05							
LOCATION								Atlanta GA		BORING #				P-10-C					
DEPTH				DESCRIPTION		SAMPLE					N		CORE REQ.						
FROM	TO					NO	DEPTH	1st 6"	2nd 6"	3rd 6"									
0.0	7.5			Field Material Crush & Run															
				Top Soil															
7.5	3'			Reddish Brown Micaceous															
				Sandy Silt															
3'				Dark Brown Black Micaceous															
	6.5			Sandy Silt															
6.5	12			Brown Micaceous Silt															
12	15			Brown & Red Silt															
15				Red Micaceous Silt															
				Residual Soils Approx															
				52'															
	60			Saprolite / W Rocks Lenses		1	61.5	9	9	11	20								
				Damp Approx 70'		2	66.5	4	7	11	18								
				Red & Brown Micaceous Silt with Rock		3	71.5	5	10	11	21								
				Red		4	76.5	2	3	5	8								
						5	81.5	3	2	5	7								
						6	86.5	12	13	18	31								
						7	91.5	14	23	27	50								
						8	96.5	9	20	24	44								
FROM		TO		4.25		FROM		TO		REMARKS				CME 550					
SS				AUGER		7.5		100'											
WASH				TRI-CONE															
CASING				CORE															
BIT																			
GWATOB						GW 24 HRS.						ELEVATION:							
DRILLED BY						B.F.						LOGGED BY				M. K. Hughes			

800961











01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
 X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\INT\PLANT MCD AP3&4 BORINGS.GPJ

# RECORD OF BOREHOLE CPT-28-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
 PROJECT NO.: 1539180 / 1538098  
 LOCATION: Dry Stack #1

DRILLING START: October 26, 2015 13:20  
 DRILLING END: October 26, 2015 13:39  
 COORDINATES: N: 1,393,999 E: 2,203,453

SHEET: 1 of 1  
 GS ELEV.: 858.0  
 TOC ELEV.: na  
 DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	
0		0.0		858.0						
5	3-1/4" HSA	2.0	FILL, (SP), SAND and GRAVEL, gravel fine grained, angular, sand fine to coarse grained, some non plastic fines; gray; non-cohesive, loose, moist, gravel road base / fill	856.0	SP					
10			ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, some sand fine grained; dark gray with black, homogeneous; non-cohesive, very loose, dry to moist, mostly fine-size particles / fly ash		CL-ML		DO S-1	1-3-2 (5)	13 18	5
10.5		10.5		847.5			DO S-2	0-1-1 (2)	18 18	2
			Bottom of borehole at 10.5 ft. Backfilled with auger cuttings.							
15										
20										
25										
30										
35										
40										
45										
50										
55										

DRILLING CO.: Premier Drilling  
 DRILLER: Scott Towe  
 DRILL RIG: CME 550

LOGGED: Randy Pettyjohn  
 CHECKED: GLH





01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\INT\PLANT MCD AP3&4 BORINGS.GPJ

# RECORD OF BOREHOLE CPT-32-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
PROJECT NO.: 1539180 / 1538098  
LOCATION: Dry Stack #1

DRILLING START: October 27, 2015 08:30  
DRILLING END: October 27, 2015 08:50  
COORDINATES: N: 1,393,697 E: 2,203,600

SHEET: 1 of 1  
GS ELEV.: 858.0  
TOC ELEV.: na  
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft		NOTES WATER LEVELS	ADDITIONAL LAB TESTING	
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	WATER CONTENT (%)			
										W <sub>p</sub>			W <sub>i</sub>
0		0.0		858.0									
	3-1/4" HSA	0.5	FILL, (SP), SAND, sand fine to medium grained, some non plastic fines; dark gray-brown with black, trace coal refuse; non-cohesive, loose, moist	857.5	SP		DO S-1	3-3-5-5 (8)	24 24	8			
					SM								
5		4.5	FILL, (SM), SILTY SAND, sand fine to medium grained, non plastic fines, trace gravel fine grained, angular; light gray-brown, homogeneous; cohesive, firm, moist	853.5			DO S-2	5-4-13-26 (17)	24 24	17			
					CL-ML		AS Bulk-1 DO S-3	1-1-2-1 (3)	60 15 24	3			
10		10.0	ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine grained; very dark gray with black, homogeneous; non-cohesive, very loose, dry to moist, mostly fine-size particles / fly ash	848.0									
			Bottom of borehole at 10.0 ft. Backfilled with auger cuttings.										
15													
20													
25													
30													
35													
40													
45													
50													
55													

DRILLING CO.: Premier Drilling  
DRILLER: Scott Towe  
DRILL RIG: CME 550

LOGGED: P. Callahan / R. Pettyjohn  
CHECKED: GLH



CPT-32-AP4 (boring)



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\INT\PLANT MCD AP3&4 BORINGS.GPJ

# RECORD OF BOREHOLE CPT-33-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
PROJECT NO.: 1539180 / 1538098  
LOCATION: Dry Stack #1

DRILLING START: October 27, 2015 09:00  
DRILLING END: October 27, 2015 09:20  
COORDINATES: N: 1,393,675 E: 2,203,570

SHEET: 1 of 1  
GS ELEV.: 856.0  
TOC ELEV.: na  
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	
0		0.0		856.0						
		0.5	FILL, (SP), SAND, sand fine to medium	855.5	SP		DO	3-2-3-4	20	
		2.0	grained, some non plastic fines, trace gravel	854.0	SM		S-1	(5)	24	
			fine grained, angular; dark gray, trace coal							
			refuse; non-cohesive, very loose, moist							
5		5.0	FILL, (SM), SILTY SAND, sand fine to	851.0	SM		DO	2-4-5-10	18	
			medium grained, non plastic fines, trace				S-2	(9)	24	
			gravel fine grained, angular; dark							
			gray-brown, homogeneous; non-cohesive,							
			loose, moist							
			FILL, (SM), SILTY SAND, sand fine to		CL-ML		AS			
			medium grained, non plastic to medium				Bulk-1			
			plasticity fines, trace gravel fine grained,				DO	1-2-2-1	60	
10		10.0	angular; light brown, homogeneous;	846.0			S-3	(4)	12	
			cohesive, firm to stiff, moist						24	
			ASH, (CL-ML), silty CLAY, poorly graded,							
			non plastic fines, sand fine grained; gray,							
			homogeneous; non-cohesive, very loose,							
			dry to moist, mostly fine-size particles / fly							
			ash							
15			Bottom of borehole at 10.0 ft.							
			Backfilled with auger cuttings.							
20										
25										
30										
35										
40										
45										
50										
55										

DRILLING CO.: Premier Drilling  
DRILLER: Scott Towe  
DRILL RIG: CME 550

LOGGED: P. Callahan / R. Pettyjohn  
CHECKED: GLH



CPT-33-AP4 (boring)






01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
 X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\INT\PLANT MCD AP3&4 BORINGS.GPJ

# RECORD OF BOREHOLE CPT-39-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
 PROJECT NO.: 1539180 / 1538098  
 LOCATION: Dry Stack #1

DRILLING START: October 28, 2015 13:53  
 DRILLING END: October 28, 2015 14:08  
 COORDINATES: N: 1,393,878 E: 2,203,710

SHEET: 1 of 1  
 GS ELEV.: 854.0  
 TOC ELEV.: na  
 DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING				
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)			WATER CONTENT (%)			
												W <sub>p</sub>	W <sub>L</sub>	W <sub>U</sub>	W <sub>I</sub>
0		0.0		854.0											
5	3-1/4" HSA	2.0	FILL, (SP), SAND and GRAVEL, gravel fine grained, angular, sand medium to coarse grained, some non plastic fines; gray; non-cohesive, loose, moist  ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, some sand fine grained; brown-gray, homogeneous; non-cohesive, loose, moist, mostly fine-size particles / fly ash	852.0	SP										
					CL-ML		DO S-1	4-5-7/0" (12)	18 18	12					
							AS Bulk-1		60						
10		10.5		843.5			DO S-2	1-2-2/0" (4)	18 18	4					
15		Bottom of borehole at 10.5 ft. Backfilled with auger cuttings.													
20															
25															
30															
35															
40															
45															
50															
55															

DRILLING CO.: Premier Drilling  
 DRILLER: Scott Towe  
 DRILL RIG: CME 550

LOGGED: P. Callahan / R. Pettyjohn  
 CHECKED: GLH



CPT-39-AP4 (boring)



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
 X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\INT\PLANT MCD AP3&4 BORINGS.GPJ

# RECORD OF BOREHOLE CPT-41-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
 PROJECT NO.: 1539180 / 1538098  
 LOCATION: Dry Stack #1

DRILLING START: October 28, 2015 08:50  
 DRILLING END: October 28, 2015 09:10  
 COORDINATES: N: 1,393,709 E: 2,203,206

SHEET: 1 of 1  
 GS ELEV.: 859.0  
 TOC ELEV.: na  
 DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	
0		0.0		859.0						
5	3-1/4" HSA	2.0	FILL, (SP), SAND and GRAVEL, sand fine to medium grained, gravel fine grained, angular, some non plastic fines; dark gray with black, trace coal refuse; non-cohesive, compact, moist to wet	857.0	SP		DO S-1	18-22-23-17 (45)	2 24	
			ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine grained; dark gray, homogeneous; non-cohesive, very loose, dry to moist, mostly fine-size particles / fly ash				DO S-2	2-2-3-3 (5)	14 24	5
10					CL-ML		DO S-3	3-3-2-2 (5)	24 24	5
15		15.0		844.0			DO S-4	2-2-2-3 (4)	24 24	4
20			Bottom of borehole at 15.0 ft. Backfilled with auger cuttings.							
25										
30										
35										
40										
45										
50										
55										

DRILLING CO.: Premier Drilling  
 DRILLER: Scott Towe  
 DRILL RIG: CME 550

LOGGED: Patrick Callahan  
 CHECKED: GLH



CPT-41-AP4 (boring)



# RECORD OF BOREHOLE CPT-42-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
 PROJECT NO.: 1539180 / 1538098  
 LOCATION: Dry Stack #1

DRILLING START: October 28, 2015 09:20  
 DRILLING END: October 28, 2015 09:35  
 COORDINATES: N: 1,393,507 E: 2,202,698

SHEET: 1 of 1  
 GS ELEV.: 859.0  
 TOC ELEV.: na  
 DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	
0		0.0		859.0						
			FILL, (SP-SM), SAND, sand fine to coarse grained, low plasticity fines, trace gravel fine grained; dark brown, trace organics; cohesive, firm, moist		SP-SM		DO S-1	3-5-8-8 (13)	24 24	
							AS Bulk-01		60 24	
5		4.0		855.0			DO S-2	4-2-2-2 (4)	24 24	
			ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine to medium grained; dark brown-gray, homogeneous; non-cohesive, very loose, dry to moist, mostly fine-size particles / fly ash		CL-ML					
10							DO S-3	2-2-2-2 (4)	24 24	
		11.0		848.0						
			ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine to medium grained; dark brown-gray, homogeneous; non-cohesive, very loose, moist to wet, mostly fine-size particles / fly ash		CL-ML		DO S-4	2-1-1-1 (2)	19 24	
15		15.0		844.0						
			Bottom of borehole at 15.0 ft. Backfilled with auger cuttings.							
20										
25										
30										
35										
40										
45										
50										
55										

DRILLING CO.: Premier Drilling  
 DRILLER: Scott Towe  
 DRILL RIG: CME 550

LOGGED: Patrick Callahan  
 CHECKED: GLH



CPT-42-AP4 (boring)



SHEET: 1 of 1  
GS ELEV.: 847.0  
TOC ELEV.: na  
DATUM:

PROJECT:	McDonough Ash Pond 3&4 Investigation and De-Watering	DRILLING START:	October 27, 2015 10:05
PROJECT NO.:	1539180 / 1538098	DRILLING END:	October 27, 2015 11:15
LOCATION:	Dam Crest - Ash Pond 4	COORDINATES:	N: 1,393,609 E: 2,204,021

DRILLING CO.: Premier Drilling  
DRILLER: Scott Towe  
DRILL RIG: CME 550

LOGGED: Patrick Callahan  
CHECKED: GLH



1 of 1

01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300\_FIELD INFORMATION\GINT\PLANT MCD AP3&4 BORINGS.GPJ



# RECORD OF BOREHOLE CPT-49-AP4 (boring)

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
PROJECT NO.: 1539180 / 1538098  
LOCATION: Dam Crest - Ash Pond 4

DRILLING START: October 27, 2015 12:35  
DRILLING END: October 27, 2015 13:20  
COORDINATES: N: 1,394,266 E: 2,203,855

SHEET: 1 of 1  
GS ELEV.: 847.0  
TOC ELEV.: na  
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	
0		0.0		847.0						
		0.3	(GP), GRAVEL, gravel fine grained, angular, sand fine to coarse grained, trace non plastic fines; Gravel road base	846.8	GP		DO S-1	5-4-6-5 (10)	24	
		2.0		845.0						
5			FILL, (SP), SAND, sand fine to coarse grained, trace gravel fine grained, angular, trace non plastic fines; dark gray-brown, trace organics; non-cohesive, compact, moist		SM		DO S-2	5-4-7-10 (11)	24	
		6.0		841.0						
			FILL, (SM), SILTY SAND, sand fine to medium grained, low plasticity to medium plasticity fines; light gray-brown, homogeneous; cohesive, firm to compact, moist				AS Bulk-01 DO S-3	3-3-4-6 (7)	36	
10										
			FILL, (SP-SM), SILTY SAND, sand fine to medium grained, trace coarse sand, low plasticity to medium plasticity fines; gray-brown with red-brown, homogeneous; non-cohesive, loose, moist, zones of stiff silt				DO S-4	3-4-6-9 (10)	24	
15										
					SP-SM		DO S-5	4-6-9-8 (15)	24	
20										
							DO S-6	5-6-9-10 (15)	24	
25										
		28.4		818.6						
30			FILL, (SP), SILTY SAND, sand fine grained, some medium plasticity fines; light gray-brown; non-cohesive, loose, moist		SP		DO S-7	5-8-7-9 (15)	8	
		30.0		817.0						
			(SM), SILTY SAND, sand fine to medium grained, low plasticity fines; dark gray-brown, mottled, RESIDUUM; non-cohesive, loose, moist		SM		AS Bulk-02 DO S-8	3-3-4-5 (7)	60	
35										
		35.0		812.0						
			(MH), SILT, high plasticity fines, sand fine grained; dark red-brown, RESIDUUM; cohesive, soft to firm, w ~ PL		MH		DO S-9	2-3-3-1 (6)	5	
40										
		43.0		804.0						
45			(SM), SILTY SAND, sand fine to medium grained, low plasticity fines; dark red-brown and gray, mottled, RESIDUUM, trace mica; micaceous, non-cohesive, loose, moist		SM		DO S-10	2-4-7-12 (11)	4	
		45.0		802.0						
			Bottom of borehole at 45.0 ft. Backfilled with bentonite grout. Backfilled with bentonite grout							
50										
55										

DRILLING CO.: Premier Drilling  
DRILLER: Scott Towe  
DRILL RIG: CME 550

LOGGED: Patrick Callahan  
CHECKED: GLH



CPT-49-AP4 (boring)



# RECORD OF BOREHOLE PZ-2

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
PROJECT NO.: 1539180 / 1538098  
LOCATION: Dry Stack #1

DRILLING START: October 29, 2015 08:35  
DRILLING END: October 29, 2015 11:00  
COORDINATES: N: 1,393,757 E: 2,203,537

SHEET: 1 of 2  
GS ELEV.: 858.0  
TOC ELEV.: na  
DATUM:

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			■ PENETRATION RESISTANCE BLOWS / ft		NOTES WATER LEVELS	ADDITIONAL LAB TESTING	
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)	WATER CONTENT (%)			
										W <sub>p</sub>			W <sub>i</sub>
0		0.0		858.0									
5	7-inch drag bit		ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine grained; dark gray and black, homogeneous; non-cohesive, very loose, moist to wet, mostly fine-size particles / fly ash; stingers of medium sand, black bottom ash (38-58 ft-bgs)		CL-ML								
10													
15													
20													
25													
30													
35													
40													
45													
50													
55													

Log continued on next page

Log continued on next page

DRILLING CO.: Premier Drilling  
DRILLER: Scott Towe  
DRILL RIG: CME 550

LOGGED: P. Callahan / J. Myers  
CHECKED: GLH



01 - GOLDER - BOREHOLE RECORD - DF STD US LAB E-M.GDT - 12/22/15 11:07  
X:\CLIENTS\SOUTHERN COMPANY\1539180 MCDONOUGH ASH PONDS 3 AND 4 CLOSURE\300 FIELD INFORMATION\GINT\PLANT MCD AP3&4 BORINGS.GPJ



# RECORD OF BOREHOLE PZ-2

PROJECT: McDonough Ash Pond 3&4 Investigation and De-Watering  
 PROJECT NO.: 1539180 / 1538098  
 LOCATION: Dry Stack #1

SHEET: 2 of 2  
 GS ELEV.: 858.0  
 TOC ELEV.: na  
 DATUM:

DRILLING START: October 29, 2015 08:35  
 DRILLING END: October 29, 2015 11:00  
 COORDINATES: N: 1,393,757 E: 2,203,537

DEPTH (ft)	BORING METHOD	SOIL PROFILE				SAMPLES			PENETRATION RESISTANCE BLOWS / ft	NOTES WATER LEVELS	ADDITIONAL LAB TESTING
		Depth	DESCRIPTION	Elev	USCS	GRAPHIC LOG	SAMPLE TYPE & NUMBER	BLOWS per 6 in ASTM D1586 140 lb hammer 30 inch drop Automatic hammer	REC ATT (in)		
55		55.0		803.0							
60			ASH, (CL-ML), silty CLAY, poorly graded, non plastic fines, sand fine grained; dark gray and black, homogeneous; non-cohesive, very loose, moist to wet, mostly fine-size particles / fly ash; stingers of medium sand, black bottom ash (38-58 ft-bgs) (continued)				DO S-4	0-0-0-0 (0)	24 24		
65											
70							DO S-5	0-0-1-0 (1)	24 24		
75					CL-ML						
80							DO S-6	1-1-1-1 (2)	24 24		
85											
90		89.0 90.0	FILL, (SM), SILTY SAND, sand fine to medium grained, trace coarse sand, high plasticity fines; dark brown and red-brown, trace organics; cohesive, soft to firm, moist Bottom of borehole at 90.0 ft. Completed as well. Refer to diagram. Piezometer installed after SPT sampling	769.0 768.0	SM		DO S-7	0-0-0-0 (0)	24 24		
95											
100											
105											
110											

DRILLING CO.: Premier Drilling  
 DRILLER: Scott Towe  
 DRILL RIG: CME 550

LOGGED: P. Callahan / J. Myers  
 CHECKED: GLH





# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT
845			0 5 10 15 20 30 40 60 80 100
835		FIRM TAN & GRAY MUCACEOUS SILTY MEDIUM TO FINE SAND TO VERY STIFF RED BROWN MUCACEOUS SANDY SILTY CLAY (FILL)	
825			
815			
805	33		
795		FIRM TO DENSE RED, TAN & GRAY MUCACEOUS SILTY MEDIUM TO FINE SAND	
785			
775			
765	77 80		

## REMARKS:

LOCATION: STA 6+75

INSTALLED: 35' SOLID PVC (4")  
(GROUTED)

35' SOLID PVC (2")

50' SLOTTED PVC (2")

DRILLED BY WM

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-1A

DATE STARTED 11-15-76

DATE COMPLETED 11-17-76

JOB NUMBER SA-1401

SHEET 1 OF 2

\* ESTIMATED FROM SITE PLAN



# TEST BORING RECORD

[illegible]

REMARKS:

LOCATION: STA 6+75

DRILLED BY WM  
LOGGED BY INRT  
CHECKED BY SAS

BORING NUMBER P-1A  
DATE STARTED 11-15-76  
DATE COMPLETED 11-17-76  
JOB NUMBER SA-1401

~~✓~~ ESTIMATED FROM SIDE PLAN

SHEET 2 OF 2



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT																			
			0	5	10	15	20	30	40	60	80	100										
820	0	FIRM TAN AND GRAY MUCACEOUS SILTY MEDIUM TO FINE SAND (FILL)	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>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## REMARKS:

LOCATION: STA 6+75

INSTALLED: 40' SOLID PVC (2")  
10' SLOTTED PVC (2")

DRILLED BY WS  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-2  
DATE STARTED 11-22-76  
DATE COMPLETED 11-22-76  
JOB NUMBER SA-1401

\*Estimated From Site Plan



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT									
			0	5	10	15	20	30	40	60	80	100
845	0	FIRM TAN & GRAY MILACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL AND VERY STIFF RED BROWN & TAN SANDY SILTY CLAY WITH GRAVEL (FILL)										
835												
825												
815												
805												
795												
785												
775												
765	80											

12-3-74

## REMARKS:

LOCATION: STA 16+50  
 INSTALLED: 90' SOLID PVC (4")  
 (ROUTED)  
 93' SOLID PVC (2")  
 20' SLOTTED PVC (2")

DILLED BY HC  
 LOGGED BY MRT  
 CHECKED BY SAS

BORING NUMBER P-4A  
 DATE STARTED 11-22-76  
 DATE COMPLETED 11-23-76  
 JOB NUMBER SA-1401

SHEET 1 OF 2

\* Estimated From Site Plan

844  
 88  
 756



# TEST BORING RECORD

ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT
			0 5 10 15 20 30 40 60 80 100
765	80		
755	88	DENSE TO VERY DENSE TAN & GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL	
745	97		
735	110	PARTIALLY WEATHERED ROCK SAMPLED AS VERY DENSE TAN & GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL	
		BORING TERMINATED @ 110'	

REMARKS:

LOCATION: STA 16+50

DRILLED BY H C

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-4A

DATE STARTED 11-22-76

DATE COMPLETED 11-23-76

JOB NUMBER 5A-1401

\*Estimated From Site Plan

SHEET 2 OF 2



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
			0	5	10	15	20	30	40	60	80	100	
845	0	FIRM TAN & GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL TO VERY STIFF TAN-BROWN MICACEOUS SANDY SILTY CLAY WITH GRAVEL (FILL)											
835													
825													
			12-3-74										
815	27	VERY STIFF TAN-BROWN AND GRAY MICACEOUS SANDY SILT											
805													
795	44	DENSE TAN-BROWN MICACEOUS SILTY MEDIUM TO FINE SAND WITH WEATHERED ROCK LAYERS											
785	58	VERY DENSE TAN-BROWN MICACEOUS SILTY MEDIUM TO FINE SAND											
775	67	PARTIALLY WEATHERED ROCK SAMPLED AS TAN-BROWN MICACEOUS SILTY MEDIUM TO FINE SAND.											
	70	BORING TERMINATED @ 70'											
												100%	

## REMARKS:

LOCATION: STA 25+00

INSTALLED: 30' SOLID PVC (4")  
30' SOLID PVC (2")  
40' SLOTTED PVC (2")

DRILLED BY H C  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-7A  
DATE STARTED 11-17-76  
DATE COMPLETED 11-18-76  
JOB NUMBER SA-1401

\*Estimated From Site Plan



# TEST BORING RECORD

* ELEV.		DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
				0	5	10	15	20	30	40	60	80	100	
845	0	FIRM TAN-BROWN AND GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL AND VERY STIFF RED-BROWN MICACEOUS SANDY SILTY CLAY WITH GRAVEL (FILL)												
835														
825														
815														
805														
795														
785														
775														
765	77													

12-3-74

## REMARKS:

LOCATION: STA 33+00

INSTALLED: 80' SOLID PVC (4")  
80' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY HC  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-10A  
DATE STARTED 11-18-76  
DATE COMPLETED 11-19-76  
JOB NUMBER SA-1401

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

REMARKS:

LOCATION: STA 33+00

DRILLED BY HC  
LOGGED BY met  
CHECKED BY SAS

BORING NUMBER P-10A  
DATE STARTED 11-18-76  
DATE COMPLETED 11-19-76  
JOB NUMBER SA-1401

\* Estimated From Setz Plan



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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## REMARKS:

LOCATION: STA 16+50

INSTALLED: 90' SOLID PVC (4")  
(ROUTED)

93' SOLID PVC (2")

20' SLOTTED PVC (2")

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-4A

DATE STARTED 11-22-76

DATE COMPLETED 11-23-76

JOB NUMBER SA-1401

SHEET 1 OF 2

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

REMARKS:

LOCATION: STA 16+50

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-4A

DATE STARTED 11-22-76

DATE COMPLETED 11-23-76

JOB NUMBER 5A-1401

\*Estimated From Site Plan

SHEET 2 OF 2



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT 0 5 10 15 20 30 40 60 80 100										
845	0	FIRM TAN & GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL TO VERY STIFF TAN-BROWN MICACEOUS SANDY SILTY CLAY WITH GRAVEL (FILL)											
835													
825													
	27	VERY STIFF TAN-BROWN AND GRAY MICACEOUS SANDY SILT											
815													
805													
	44	DENSE TAN-BROWN MICACEOUS SILTY MEDIUM TO FINE SAND WITH WEATHERED ROCK LAYERS											
795													
	58												
785		PARTIALLY WEATHERED ROCK SAMPLED AS TAN-BROWN MICACEOUS SILTY MEDIUM TO FINE SAND											
	67												
775	70												
		BORING TERMINATED @ 70'											

12-3-74

100%

## REMARKS:

LOCATION: STA 25+00

INSTALLED: 30' SOLID PVC (4")  
30' SOLID PVC (2")  
40' SLOTTED PVC (2")

DRILLED BY H C

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-7A

DATE STARTED 11-17-76

DATE COMPLETED 11-18-76

JOB NUMBER SA-1401

\*Estimated From Site Plan



# TEST BORING RECORD

* ELEV.		DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
				0	5	10	15	20	30	40	60	80	100	
845	0		FIRM TAN-BROWN AND GRAY MICACEOUS SILTY MEDIUM TO FINE SAND WITH GRAVEL AND VERY STIFF RED-BROWN MICACEOUS SANDY SILTY CLAY WITH GRAVEL (FILL)											
835														
825														
815														
805														
795														
785														
775														
765	77													
				<div>12-3-74</div>										

12-3-74

## REMARKS:

LOCATION: STA 33+00

INSTALLED: 80' SOLID PVC (4")

80' SOLID PVC (2")

20' SLOTTED PVC (2")

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-10A

DATE STARTED 11-18-76

DATE COMPLETED 11-19-76

JOB NUMBER SA-1401

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 33+00

DRILLED BY HC  
LOGGED BY MAT  
CHECKED BY SAS

BORING NUMBER P-10A  
DATE STARTED 11-18-76  
DATE COMPLETED 11-19-76  
JOB NUMBER SA-1401

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 6+75  
 INSTALLED: 40' SOLID PVC (2")  
 10' SLOTTED PVC (2")

DRILLED BY WS  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-2  
DATE STARTED 11-22-76  
DATE COMPLETED 11-22-76  
JOB NUMBER SA-1401

\*Estimated from Site Plan



# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT
845			0 5 10 15 20 30 40 60 80 100
835		FIRM TAN & GRAY MUCACEOUS SILTY MEDIUM TO FINE SAND TO VERY STIFF RED BROWN MUCACEOUS SANDY SILTY CLAY (FILL)	
825			
815			
	33		
805		FIRM TO DENSE RED, TAN & GRAY MUCACEOUS SILTY MEDIUM TO FINE SAND	
795			
785			
775			
	77		
765	80		

12-3-76

## REMARKS:

LOCATION: STA 6+75

INSTALLED: 35' SOLID PVC (4")  
(GROUTED)

35' SOLID PVC (2")

50' SLOTTED PVC (2")

DRILLED BY WM

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-1A

DATE STARTED 11-15-76

DATE COMPLETED 11-17-76

JOB NUMBER SA-1401

SHEET 1 OF 2

\* ESTIMATED FROM SITE PLAN



# TEST BORING RECORD

[illegible]

REMARKS:

LOCATION: STA 6+75

DRILLED BY WM  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-1A  
DATE STARTED 11-15-76  
DATE COMPLETED 11-17-76  
JOB NUMBER SA-1401

\* ESTIMATED FROM SIDE PLAN

SHEET 2 OF 2



### DESCRIPTION

\*ESTIMATED FROM SITE PLAN



# TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 33+00

INSTALLED: 22' SOLID PVC (2")

20' SLOTTED PVC (2")

DRILLED BY

LOGGED BY

**CHECKED BY**

BORING NUMBER

DATE STARTED

DATE COMPLETED

**JOB NUMBER**

P-12

12-3-76

12-3-76

SA-1401

\* ESTIMATED FROM SITE PLAN



# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT																
			0	5	10	15	20	30	40	60	80	100							
820	0	AUGER BORING TO 80' NO SAMPLES TAKEN																	
810																			
800																			
790																			
780																			
770																			
760																			
750																			
740	80		BORING TERMINATED @ 80'																

12-3-74

## REMARKS:

LOCATION: STA 33+00

INSTALLED 63' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-11

DATE STARTED 12-2-76

DATE COMPLETED 12-2-76

JOB NUMBER SA-1401

\*ESTIMATED FROM SITE PLAN



# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
			0	5	10	15	20	30	40	50	60	80	100
845	0	AUGER BORING TO 75' NO SAMPLES TAKEN											
835													
825													
815													
805													
795													
785													
775													
765													
	75												
		BORING TERMINATED @ 75'											

12-3-74

REMARKS:

LOCATION: STA 32+50	DRILLED BY <u>HC</u>	BORING NUMBER <u>P-10B</u>
INSTALLED 53' SOLID PVC (2")	LOGGED BY <u>MRT</u>	DATE STARTED <u>12-1-76</u>
25' SLOTTED PVL (2")	CHECKED BY <u>SAS</u>	DATE COMPLETED <u>12-1-76</u>
		JOB NUMBER <u>SA-1401</u>

\* Estimated From Site Plan



# TEST BORING RECORD

* ELEV.	DEPTH	DESCRIPTION	PENETRATION-BLOWS PER FOOT																	
	FEET		0	5	10	15	20	30	40	60	80	100								
845	0	AUGER BORING TO 75' NO SAMPLES TAKEN																		
835																				
825																				
815																				
805																				
795																				
785																				
775																				
	75																			
		BORING TERMINATED @ 75'																		
765																				

## REMARKS:

LOCATION: STA 33+00

INSTALLED : 60' SOLID PVC (2")  
15' SLOTTED PVC (2")  
75'

DRILLED BY HC  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-10  
DATE STARTED 11-19-76  
DATE COMPLETED 11-19-76  
JOB NUMBER SA-1401

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 25+00

INSTALLED: 23' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-9

DATE STARTED 12-2-76

DATE COMPLETED 12-3-76

JOB NUMBER SA-1401

\*Estimated from Site Plan



# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
			0	5	10	15	20	30	40	60	80	100	
820	0	AUGER BORING TO 40' NO SAMPLES TAKEN											
810													
800													
790													
780	40	BORING TERMINATED @ 40'											

## REMARKS:

LOCATION: STA 25+00  
 INSTALLED: 22' SOLID PVC (2")  
 20' SLOTTED PVC (2")

DRILLED BY W.S.  
 LOGGED BY MRT  
 CHECKED BY SAS

BORING NUMBER P-8  
 DATE STARTED 11-23-76  
 DATE COMPLETED 11-23-76  
 JOB NUMBER SA-1401

\* Estimated From Site Plan



## TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 25+00

INSTALLED: 10' SOLID PVC (2")

10' SLOTTED PVC (2")

DRILLED BY

LOGGED BY

**CHECKED BY**

**BORING NUMBER**

DATE STARTED

DATE COMPLETED

**JOB NUMBER**

P-7

11-17-76

11-17-76

SA-1401

\*Estimated From Site Plan



## TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 16+50

INSTALLED: 20' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY W/S

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-6

DATE STARTED 11-23-76

DATE COMPLETED 11-23-76

JOB NUMBER SA-1401

\* Estimated from Site Plan



# TEST BORING RECORD

*ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
			0	5	10	15	20	30	40	60	80	100	
820	0	AUGER BORING TO 100' NO SAMPLES TAKEN	=	12-3-76									
800													
780													
760													
740													
720	100	BORING TERMINATED @ 100'											

12-3-76

REMARKS: NOTE: SCALE 1"=20'

LOCATION: STA 16+50

INSTALLED: 83' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY HC  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-5  
DATE STARTED 11-30-76  
DATE COMPLETED 11-30-76  
JOB NUMBER SA-1401

\*Estimated From Site Plan



# TEST BORING RECORD

* ELEV.	DEPTH FEET	DESCRIPTION	PENETRATION-BLOWS PER FOOT										
0	5	10	15	20	30	40	60	80	100				
845	0	AUGER BORING TO 85' NO SAMPLES TAKEN											
835													
825													
815													
805													
795													
785													
775													
765													

12-3-74

REMARKS: <sup>85</sup> BORING TERMINATED @ 85'

LOCATION: STA 16+50

INSTALLED: 65' SOLID PVC (2")  
20' SLOTTED PVC (2")

DRILLED BY HC

LOGGED BY MRT

CHECKED BY SAS

BORING NUMBER P-4

DATE STARTED 11-23-76

DATE COMPLETED 11-23-76

JOB NUMBER SA-1401

\* Estimated From Site Plan



# TEST BORING RECORD

[illegible]

REMARKS:

DRILLED BY N/A  
LOGGED BY \_\_\_\_\_  
CHECKED BY \_\_\_\_\_

BORING NUMBER P-3  
DATE STARTED N/A  
DATE COMPLETED N/A  
JOB NUMBER SA-1401



## TEST BORING RECORD

[illegible]

## REMARKS:

LOCATION: STA 6+75

INSTALLED: 20' SOLID PVC(2")  
10' SLOTTED PVC(2")

DRILLED BY WM  
LOGGED BY MRT  
CHECKED BY SAS

BORING NUMBER P-1  
DATE STARTED 11-17-76  
DATE COMPLETED 11-17-76  
JOB NUMBER 5A-1401

\* ESTIMATED FROM SITE PLAN





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