

GROUNDWATER MONITORING PLAN

PLANT BRANCH CCR LANDFILL

PUTNAM COUNTY, GEORGIA

FOR



Georgia
Power

OCTOBER 2022

REV. 0



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Approved

Solid Waste Management Program

Approved By: _____

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consultants

engineers | scientists | innovators

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I. CERTIFICATION

This *Groundwater Monitoring Plan, Georgia Power Company - Plant Branch CCR Landfill* has been prepared by, or under the direct supervision of, a Qualified Groundwater Scientist and a registered professional engineer with Geosyntec Consultants, Inc. (Geosyntec) to meet the requirements contained in Chapter 391-3-4-.10 of the Georgia Environmental Protection Division Rules of Georgia, Solid Waste Management, Coal Combustion Residuals (i.e., State CCR Rule) as well as the United States Environmental Protection Agency Coal Combustion Residuals Rule (40 CFR §257), Part 90. References to the appropriate sections of the State CCR Rule are incorporated throughout this document.

I hereby certify that this Groundwater Monitoring Plan was prepared by, or under the direct supervision of, a Qualified Groundwater Scientist and a Registered Professional Engineer in accordance with the State of Georgia Rules of Solid Waste Management. According to 391-3-4-.01(57), a Qualified Groundwater Scientist is “a professional engineer or geologist registered to practice in Georgia who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.” The design of the groundwater monitoring system was developed in compliance with Georgia Environmental Protection Division Rules of Solid Waste Management, Chapter 391-3-4.10(6).

Signature: _____

Date: _____

Joseph M. Ivanowski

10-14-2022



Signature: _____

Date: _____

M. Iscimen

10/14/2022



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

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1. INTRODUCTION

Groundwater monitoring is required for CCR units by the Georgia Environmental Protection Division (GA EPD) to detect and quantify potential changes in groundwater chemistry. This Groundwater Monitoring Plan (plan) describes the groundwater monitoring program for the proposed CCR Landfill at Georgia Power Company's (GPC's) Plant Branch (Plant). This plan meets the requirements of GA EPD rules and uses GA EPD's Manual for Ground Water Monitoring dated September 1991 as a guide. Groundwater monitoring well locations are presented on **Figures A-1** and **A-2** of **Appendix A**.

Groundwater monitoring will occur in accordance with 391-3-4-.10 of the Georgia Solid Waste Management Rules. If the monitoring requirements specified in this plan conflict with GA EPD rules (391-3-4), the GA EPD rules will take precedent.

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals Rule (40 CFR §257), Part 90, which is incorporated by GA EPD CCR Rule (Solid Waste Rule 391-3-4.10) by reference, a detection monitoring well network will be installed at the proposed CCR Landfill. The design and installation of a detection monitoring well network for the Plant Branch CCR Landfill will be certified by a registered professional engineer as well as a qualified groundwater scientist. This plan documents the methods for future monitoring well installation and/or replacement, and procedures for well abandonment. As required by 391-3-4.10(6)(g), a minor modification will be submitted to the GA EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment will be directed by a qualified groundwater scientist.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

The following section summarizes the geologic and hydrogeologic conditions for the Site as described in the *Site Acceptability Report for Proposed CCR Landfill (SAR)* (Geosyntec, 2019) prepared on behalf of GPC. The SAR was submitted under separate cover from this permit application.

2.1 SITE GEOLOGY

Plant Branch is located in the Piedmont physiographic province, which lies between the Blue Ridge Mountains to the northwest and the Upper Coastal Plain to the south. This province is underlain by regionally metamorphosed rocks including granitic gneisses, amphibolite, and mica schists. Physical and chemical weathering of metamorphic and igneous rocks in the humid climate of the southern Piedmont resulted in a variably thick blanket of residual soils and saprolite above the bedrock. The Site is situated in a region underlain by high-grade metasedimentary and metavolcanic rocks of the Carolina Terrane. These rocks are locally intruded by igneous dikes and sills. The metamorphic rocks are generally poorly jointed, while the igneous intrusions are well-jointed.

Geologic mapping performed at the Site by Petrologic Solutions, Inc. (Golder, 2018) indicates that the Site is underlain by a biotite gneiss formation, with the exception of a small portion on the northwest edge of the Site which is underlain by a diabase dike. A geologic map from the Golder 2018 report is included in **Appendix A** as **Figure A-4**. Based on review of subsurface investigations at the Site, the proposed CCR Landfill is underlain primarily by three lithologic units: (i) regolith, (ii) partially weathered rock (PWR), and (iii) biotite gneiss bedrock.

The regolith unit is comprised of shallow clayey residual soils and sandy clay to clayey sand saprolite. The residual soil/saprolite regolith varies in thickness from 10 feet to 75 feet. The observed saprolite thickness is consistent with other Piedmont areas in the southeastern United States. The saprolite is thicker in upland areas, and generally thinner in lowland areas. With depth, the saprolite transitions to PWR, which accounts for a majority of the “transition zone” that lies between the saprolite and the competent bedrock. The thickness of the transition zone, consisting of PWR and upper fractured bedrock, varies considerably across the Site from approximately 5 feet to more than 70 feet, with the PWR making up the greatest part of the thickness. Competent bedrock at the Site is primarily characterized as poorly to moderately fractured with low (<30°) fracture dip angles. The competent bedrock consists of biotite gneiss occasionally interlayered with amphibolite with few open fractures. The unweathered rocks are well foliated with a planar, northeast-trending fabric, showing distinct dark and light banding, feldspar phenocrysts, quartz and feldspar augen, and few micro-fold structures. The gneissic rocks show moderate to high-grade metamorphism, as indicated by the presence of migmatitic texture noted in some samples.

2.2 SITE HYDROGEOLOGY

The uppermost aquifer at the Site is an unconfined regional groundwater aquifer that occurs primarily in the regolith and within the PWR and upper fractured bedrock. Generally, the water table surface at the Site is a subdued reflection of topography. At the Plant scale, groundwater generally flows in an easterly direction from the higher ridges located west of the proposed CCR landfill. At the Site scale, groundwater flow is in three directions, flowing away from the crest of the ridge at the center of the Site to the northeast, southwest, and to the northwest. Localized groundwater flow directions are naturally influenced by variations in topography and the top of bedrock surface. Current groundwater flow

directions at the Site are also influenced by the existence of adjacent ash ponds, namely Ash Ponds C and D in the southeast portion of the Site.

Recharge to the bedrock aquifer system comes primarily from water stored in the regolith. The regolith soil allows for slow infiltration to the bedrock through areas of enhanced permeability. The rate of this infiltration is generally considered to be slow, as the silty, clayey-rich sandy soils present across most of the Site retard recharge from the uppermost aquifer into the underlying bedrock aquifer system. The few open fractures present in the gneiss bedrock are the only pathway for groundwater flow through bedrock, since the rock lacks primary porosity.

A potentiometric surface map was generated from water level measurements collected on January 31, 2019 and is presented in **Figure A-3 of Appendix A**. Depths to groundwater vary considerably across the Site from approximately 30 feet to as much as 50 feet in the higher topographic elevations and to as little as two feet at the toe of the Pond D dike, nearest the shoreline of Lake Sinclair. Groundwater flow is generally away from the topographic high near the center of the Site and Ash Pond D toward Lake Sinclair or its tributaries.

The representative groundwater hydraulic gradient for the Site, based on January 2019 water level data, is approximately 0.044 feet/foot (ft/ft). An effective porosity of 0.19 (from ATC, 2000) was used to represent average site porosity conditions. The geometric mean horizontal hydraulic conductivity (k_h) based on slug test data collected at the Site for the regolith, regolith/PWR, and PWR/bedrock units combined (1.09 ft/day) was used to represent typical site conditions.

The groundwater flow velocity calculations were performed using a k_h of 1.09 ft/day, an average hydraulic gradient of 0.044 ft/ft, and a typical effective porosity of 0.19. These calculations yielded a groundwater flow velocity of 0.25 ft/day for typical Site conditions.

It should be noted that the dewatering and removal of CCR from the onsite ash ponds will likely result in transient and locally dynamic groundwater flow conditions at the Site. As additional data and information are collected during design and construction of the pond closures, the estimated transient and post-closure groundwater conditions may be re-evaluated and refined with respect to the proposed CCR landfill design.

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells will be installed to monitor the uppermost aquifer beneath the Site. Well locations are selected based on the proposed CCR landfill footprint, phasing of construction and waste placement, and geologic and hydrogeologic considerations. Well spacings at the proposed landfill were based on site-specific conditions such as an engineered landfill liner and cover system, typical Piedmont hydrogeology (i.e. no complex faulting or karst conditions), similar lithologic units and hydraulic conductivity and gradients within the Site, no discrete preferential flow pathways, no expected point source leakage, and a waste that is compatible with the liner. Maps depicting the proposed monitoring well network for the CCR landfill are included in **Figures A-1 and A-2 of Appendix A**, Monitoring System Details. The potentiometric surface map in **Figure A-3 of Appendix A** depicts the groundwater surface in the vicinity of the Site based on January 2019 observations. A more detailed discussion of the hydrogeological conditions at the Site with respect to monitoring well placement is provided in the SAR (Geosyntec, 2019).

Monitoring Well Network Phasing

Construction of the proposed CCR landfill cells, underdrain, and subsequent placement of the CCR in the cells, will take place in phases over the course of several years. For the purpose of establishing the groundwater monitoring network, cell construction has been grouped into two primary construction phases (Phase 1 and Phase 2). The initial phase (Phase 1) will generally consist of the construction of the dikes along the western half of the landfill footprint, the construction and lining of Cells 1, 2, 3, 4, 5 and 6, and the construction of two stormwater/contact water ponds. This Phase 1 area is shown in **Figure A-1**. During this phase, CCR material from Ash Pond D as well as the other ash ponds will be removed and placed into these cells of the CCR landfill. In order to provide appropriate monitoring locations for the areas included in Phase 1, 16 groundwater monitoring wells will be installed prior to the construction of the dikes and placement of the CCR material in Cells 1 through 6. These locations are shown as Phase 1 monitoring wells in **Figure A-1**. Furthermore, these monitoring wells will be sampled prior to ash placement for background monitoring in compliance with 40 CFR §257.94(b).

Following removal of the CCR material from Ash Pond D entirely, the remaining perimeter dikes (eastern portion) of the landfill, Cells 7-10, the underdrain beneath former Ash Pond D, and an additional stormwater retention pond at the southeastern corner of the facility will be constructed, which is referred to as Phase 2 for the scope of this plan. The Phase 2 area is shown in **Figure A-2**. Nine (9) additional monitoring wells will be installed at the locations shown on **Figure A-2** providing coverage for the new cells associated with Phase 2. The underdrain is intended to collect groundwater from beneath a portion of the landfill (beneath Cells 9 and 10), which will then be managed under the appropriate NPDES permit.

Three (3) existing wells (BRGWA-2S, BRGWA-5S, and BRGWA-6) are designated for monitoring of upgradient or background conditions. These wells are currently used for monitoring upgradient conditions at Ash Pond E. In addition, two (2) existing wells (PZ-54 and PZ-55) in topographically high areas to the west of the CCR landfill as shown in **Figures A-1 and A-2**, are considered for possible use for the monitoring network. Based on their position in relation to Ash Pond E and potentially changing groundwater conditions after removal of CCR from the ash ponds, these two wells will be evaluated upon sample collection to determine their appropriateness for inclusion in the background well network. Eight background monitoring events will be completed prior to placement of the CCR, which allows for background conditions be evaluated prior to and during construction of the CCR landfill to ensure that

suitable representative samples of groundwater are being collected and that changing groundwater flow dynamics are accounted for.

All monitoring wells will be positioned to provide adequate coverage to detect potential impacts from the proposed CCR landfill. Both upgradient and downgradient wells will be screened in the uppermost aquifer, in the residuum, partially weathered rock, and/or upper fractured bedrock. Monitoring wells will be generally located outside of areas with frequent auto traffic; however, wells may be installed in heavily trafficked areas with protective measures (e.g., flush mount with traffic-rated vaults) when necessary to meet the groundwater monitoring objectives of the GA EPD rules. In addition to the potentiometric surface map, **Appendix A** also includes a tabulated list (**Table A-1**) of location coordinates for the individual monitoring wells. Additional well construction details (i.e., top-of-casing elevation, well depths and screened intervals) will be provided upon installation.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT AND REPORTING

The monitoring wells to be included in this monitoring network will be installed following USEPA Region 4 Science and Ecosystem Support Division (SESD) *Operating Procedure for Design and Installation of Monitoring Wells* (USEPA, SESDGUID-101-R2) as a general guide for best practices. Monitoring wells will be installed in accordance with the following procedures.

4.1 DRILLING

A variety of well drilling methods are available for the purpose of installing groundwater monitoring wells. Drilling methodologies include but are not limited to: hollow stem augers, direct push, air rotary, mud rotary, and rotosonic techniques. The drilling method will be selected to minimize the disturbance of subsurface materials and not cause impacts to groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in the site-specific geology. Monitoring wells will be installed using the most current version of the USEPA SESD SESDGUID-101-R2 as a general guide for best practices. Also, drilling equipment will be decontaminated before use and between borehole locations using the procedures described in the most current version of USEPA Laboratory Services and Applied Science Division *Field Equipment Cleaning and Decontamination* (LSASDPROC-205-R4). Well installation will be directed by a Qualified Groundwater Scientist.

Sampling and/or coring may be used to help determine the stratigraphy and geology at the well location. Samples and cores will be logged by a Qualified Groundwater Scientist. Screen depths will be chosen based on the depth to the uppermost aquifer.

All drilling for any subsurface hydrogeologic investigation, or for installation or abandonment of groundwater monitoring wells, will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. Standards for surveying and reporting of coordinates and elevation for monitoring wells is discussed in section 4.4.

4.2 DESIGN AND CONSTRUCTION

Well construction materials will be sufficiently durable to resist chemical and physical degradation and will not interfere with the quality of groundwater samples.

WELL CASINGS AND SCREENS

American Society for Testing and Materials (ASTM), National Science Foundation (NSF) rated, Schedule 40, 2-inch diameter polyvinyl chloride (PVC) pipe with flush threaded connections will be used for the well riser and screens. Compounds that can cause PVC to deteriorate (e.g., organic compounds) are not expected at this facility. If conditions warrant, other appropriate materials may be used for construction with prior written approval from the GA EPD.

WELL INTAKE DESIGN

Intake for groundwater monitoring wells will be designed and constructed to: (1) allow sufficient groundwater flow to the well for sampling; (2) minimize the passage of formation materials (turbidity) into the well; and (3) ensure sufficient structural integrity to prevent the collapse of the intake structure.

Each groundwater monitoring well will include a well screen designed to limit the amount of formation material passing into the well when it is purged and sampled. Screens with 0.010-inch slots have proven effective for the earth materials at the Site and will be used unless geologic conditions discovered at the time of installation dictate a different size. Screen length will not exceed 10 feet without justification as to why a different screen length is necessary (e.g., significant variation in groundwater level). If these specifications prove ineffective for developing a well with sufficient yield or acceptable turbidity, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

Pre-packed dual-wall well screens will be the preferred screen-type for well construction. Pre-packed well screens combine a centralized inner well screen, a developed filter sand pack, and an outer conductor screen in one integrated unit composed of inert materials. Pre-packed well screens will be installed following general industry standards and using the current version of USEPA SESDGUID-101-R2 as a general guide. If the dual-wall pre-packed-screened wells do not yield sufficient water or are excessively turbid after development, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

FILTER PACK AND ANNULAR SEAL

The materials used to construct the filter pack will be clean quartz sand of a size that is appropriate for the screened formation. Fabric filters will not be used as filter pack material. Sufficient filter material will be placed in the boring and measurements taken to ensure that no bridging occurs. Upon placement of the filter pack, the well may be pumped to assure settlement of the pack. If pumping is performed, the top elevation of filter pack depth will be monitored, and additional sand added if necessary. The filter pack will extend a minimum of two feet above the top of the well screen.

The materials used to seal the annular space in the boring above the well pack must prevent hydraulic communication between strata and prevent migration from overlying areas into the well screen interval. A minimum of two feet of bentonite (chips, pellets, or slurry) will be placed immediately above the filter pack. The bentonite seal will extend up to the base of any overlying confining zone or the top of the water-bearing zone to prevent cementitious grout from entering the water-bearing or screened zones. If dry bentonite is used, the bentonite must be hydrated with potable water prior to grouting the remaining annulus. The bentonite seal will be allowed to hydrate for at least eight hours or the manufacturer's recommended hydration time, whichever is greater.

The annulus above the bentonite seal will be grouted with a cement and bentonite mixture (approximately 94 pounds cement / 3 to 5 pounds bentonite / 6.5 gallons of potable water) placed via tremie pipe from the top of the bentonite seal. During grouting, care will be taken to assure that the bentonite seal is not disturbed by locating the base of the tremie pipe approximately two feet above the

bentonite seal and injecting grout at low pressure/velocity. The grout will be allowed to cure for at least 24 hours prior to well completion.

PROTECTIVE CASING AND WELL COMPLETION

After allowing the grout to settle, the well will be finished by installing a flush-mount or above-ground protective casing as appropriate, and building a surface cap. The use of flush-mount wells will generally be limited to paved surfaces unless Site operations warrant otherwise. The surface cap will extend from the top of the cementitious grout to ground surface, where it will become a concrete apron extending outward with a radius of at least 2 feet from the edge of the well casing and sloped to drain water away from the well.

Each well will be fitted with a cap that contains a hole or opening to allow the air pressure in the well to equalize with atmospheric pressure. The cap will be locked in flush mount wells. In wells with above-ground protection, the space between the well casing and the protective casing will be filled with coarse sand or pea-gravel to within approximately 6 inches of the top of the well casing. A small weep hole will be drilled at the base of the metal casing for the drainage of moisture from the casing. Above ground protective covers will be locked.

Protective bollards will be installed around each above-grade groundwater monitoring well. Well construction in high traffic areas will generally be limited unless Site conditions warrant otherwise.

The groundwater monitoring well detail attached in **Appendix B**, Groundwater Monitoring Well Detail, illustrates the general design and construction details for a monitoring well.

WELL DEVELOPMENT

After well construction is completed, wells will be developed by alternately purging and surging until relatively clear discharge water with little turbidity is observed. The goal will be to achieve a turbidity of less than 5 nephelometric turbidity units (NTUs); however, formation-specific conditions may not allow this target to be accomplished. Generally, the well will be considered properly developed once a turbidity of less than 10 NTU is achieved. Additionally, the stabilization criteria contained in **Appendix C** should be met. A variety of techniques may be used to develop Site groundwater monitoring wells. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. All development equipment will be decontaminated prior to first use and between wells.

In low-yielding wells, potable water may be added to the well to facilitate surging of the well screen interval and removal of fine-grained sediment. If water is added, the volume will be documented and at minimum two times the volume of water added will be purged from the well.

The geologic formations underlying the Site contain clay and silt particles that are small enough to work their way through a well's filter pack over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, monitoring wells may need to be redeveloped periodically to remove the silt and clay that has worked its way into the filter packs of the wells. Each monitoring well should be redeveloped when sample turbidity values

have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above.

Well development will be conducted under supervision of a certified groundwater professional and well development data will be provided as part of well installation report.

4.3 ABANDONMENT

In accordance with 391-3-4-.10(6)(g), monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the GA EPD. Well abandonment will be directed by a qualified groundwater scientist registered to practice in the State of Georgia using industry-accepted practices, the GA EPD Manual for Groundwater Monitoring (1991), and Georgia's Well Water Standards Act of 1985 [Official Code of Georgia Annotated (O.C.G.A.) § 12-5-120, 1985] as guides. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. Any piezometers or groundwater wells currently located within the footprint of the proposed CCR landfill will be over-drilled prior to abandonment. A well abandonment report will be submitted to GA EPD within 60 days of completion of well abandonment.

4.4 DOCUMENTATION

The following information documenting the construction, development, and abandonment of each new groundwater well for the CCR landfill will be certified by a Qualified Groundwater Scientist (certified Professional Engineer or Professional Geologist) and submitted to GA EPD within 60 days after completing all planned well installations:

- Well identification
- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Advisory Council
- Narrative of drilling technique applied, well construction details, and well development procedures, including drilling dates, drilling fluids used (if applicable), well casing and screen materials, screen slot size, and joint type
- Details of filter pack material/size, emplacement method (narrative), and volume
- Seal emplacement method and type/volume of sealant
- Borehole diameter and well casing diameter
- Type of protective well cap and sump dimensions
- Surface seal and volumes/mix of annular seal material
- Screen length and interval reported in feet below ground surface and elevation
- Schematic of the well dimensions for all components (e.g., casing, screen, sump, well pad)
- Well location given to within an accuracy of 0.5 feet based upon survey from acceptable survey point datum by a Georgia-registered professional surveyor
- Vertical elevations given to within an accuracy of 0.01 feet based upon survey from acceptable survey point datum by a Georgia-registered professional surveyor
- Location and vertical elevations will be referenced to Georgia State Plane Coordinate System (Georgia State Plane, West Zone, NAD83) and vertical datum North American Vertical Datum 1988 (NAVD88), respectively.
- Lithologic logs

- Narrative of well development method and documentation that water quality field parameters meet well development criteria (Section 4.2); as well as the specific procedures used and date of well development
- Well turbidity following development
- Documentation of ground surface elevation (± 0.01 feet)
- Documentation of top of casing elevation (± 0.01 feet)

In accordance with the Georgia Water Well Standards Act (O.C.G.A §12-5-120), at least once every five years, the owner of the property on which a monitoring well is constructed shall have the monitoring well(s) inspected by a professional engineer or professional geologist, who shall direct appropriate remedial corrective work to be performed if the well does not conform to standards. Well inspection records and records of remedial corrective work are subject to review by GA EPD. Additionally, the cost estimate based upon current year cost for the well inspections will be provided as part of the cost calculations for the groundwater monitoring period.

5. **GROUNDWATER MONITORING PARAMETERS AND FREQUENCY**

The following describes groundwater sampling requirements with respect to parameters for analysis, sampling frequency, sample preservation and shipment, and analytical methods. Groundwater samples used to provide compliance monitoring data will not be filtered prior to collection.

Table 1, Groundwater Monitoring Parameters and Frequency, presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from each new groundwater well will be collected and analyzed for 40 CFR §257, Subpart D, Appendix III and Appendix IV test parameters to establish a background statistical dataset. Existing background wells (BRGWA-2S, BRGWA-5S, and BRGWA-6) will have historical monitoring data for consideration. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semi-annual during CCR landfill operations, closure, and post-closure care period.

When referenced throughout this plan, Appendix III and Appendix IV parameters refer to the parameters contained in Appendix III and Appendix IV of 40 CFR 257, Subpart D, 80 Fed. Reg. 21468 (April 17, 2015).

As shown on **Table 2**, Analytical Methods, the groundwater samples will be analyzed using methods specified in EPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), EPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), ASTM, or other suitable analytical methods approved by GA EPD. The method used will be able to reach a suitable practical quantification limit to detect natural background conditions at the facility. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Conference (NELAC). Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

**TABLE 1
 GROUNDWATER MONITORING PARAMETERS & FREQUENCY**

MONITORING PARAMETER		GROUNDWATER MONITORING	
		Background	Semi-Annual Events
Field Parameters	Temperature	X	X
	pH	X	X
	ORP	X	X
	Turbidity	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
Appendix III (Detection)	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
Appendix IV (Assessment)	Antimony	X	Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4.10(6).
	Arsenic	X	
	Barium	X	
	Beryllium	X	
	Cadmium	X	
	Chromium	X	
	Cobalt	X	
	Fluoride	X	
	Lead	X	
	Lithium	X	
	Mercury	X	
	Molybdenum	X	
	Selenium	X	
	Thallium	X	
Radium 226 & 228	X		

**TABLE 2
 ANALYTICAL METHODS**

Parameters	USEPA Method Number
Boron	6010B/6020B
Calcium	6010B/6020B
Chloride	300.0/300.1/9250/9251/9253/9056A
Fluoride	300.0/300.1/9214/9056A
pH	150.1 field
Sulfate	9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	160/2540C
Antimony	EPA 7040/7041/6010B/6020B
Arsenic	EPA 7060A/7061A/6010B/6020B
Barium	EPA 7080A/7081/6010B/6020B
Beryllium	EPA 7090/7091/6010B/6020B
Cadmium	EPA 7130/7131A/6020B
Chromium	EPA 7190/7191/6010B/6020B
Cobalt	EPA 7200/7201/6010B/6020B
Fluoride	300.0/300.1/9214/9056A
Lead	EPA 7420/7421/6010B/6020B
Lithium	6010/6020B
Mercury	7470
Molybdenum	6010/6020B
Selenium	EPA 7740/7741A/6010B/6020B
Thallium	EPA 7840/7841/6010/6020B
Radium 226 and 228 combined	EPA 903/9320/9315

6. SAMPLE COLLECTION

During each sampling event, groundwater samples will be collected and handled in accordance with the procedures specified in **Appendix C**, Groundwater Sampling Procedure. Sampling procedures were developed using standard industry practice and USEPA Region 4 *Field Branches Quality System and Technical Procedures* as a guide. Low-flow sampling methodology will be utilized for sample collection. Alternative industry accepted sampling techniques may be used when appropriate with prior GA EPD approval. The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to GA EPD. Water from the underdrain sump will be collected and managed under the appropriate NPDES permit, therefore, sampling at the underdrain pipe will not be conducted.

For groundwater sampling, positive gas displacement Teflon or stainless-steel bladder pumps will be used for purging. If dedicated bladder pumps are not used, portable bladder pumps or peristaltic pumps (with dedicated or disposable tubing) may be used. When non-dedicated equipment is used, it will be decontaminated prior to use and between wells.

Per Georgia Rule 391-3-4-.10(6)(g) monitoring wells require replacement after two consecutive dry sampling events. Well installation must be directed by a qualified groundwater scientist. A minor modification will be submitted in accordance with Rule 391-3-4-.02 prior to the installation or decommissioning of monitoring wells.

7. CHAIN-OF-CUSTODY

All samples will be handled under chain-of-custody (COC) procedures beginning in the field. The COC record will contain the following information:

- Sample identification numbers
- Signature of collector
- Date and time of collection
- Sample type
- Sample point identification
- Number of sample containers
- Signature of person(s) involved in the chain of possession
- Dates and times of possession by each individual
- Notated date(s) and time(s) of sample transfer between individuals

The samples will remain in the custody of assigned personnel, an assigned agent, or the laboratory. If the samples are transferred to other employees for delivery or transport, the sampler or possessor will relinquish possession and the samples must be received by the new owner.

If the samples are being shipped, a hard copy COC will be signed and enclosed within the shipping container.

Samplers will use COC forms provided by the analytical laboratory or use a COC form similarly formatted and containing the information listed above.

8. FIELD QUALITY ASSURANCE / QUALITY CONTROL

All field quality control samples will be prepared the same as compliance samples with regard to sample volume, containers, and preservation. The following quality control samples will be collected during each sampling event:

Field Equipment Rinsate Blanks - Where sampling equipment is not new or dedicated, an equipment rinsate blank will be collected at a rate of one blank per 10 samples using non-dedicated equipment.

Field Duplicates - Field duplicates are collected by filling additional containers at the same location, and the field duplicate is assigned a unique sample identification number. One blind field duplicate will be collected for every 10 samples.

Field Blanks - Field blanks are collected in the field using the same water source that is used for decontamination. The water is poured directly into the supplied sample containers in the field and submitted to the laboratory for analysis of target constituents. One field blank will be collected for every 10 samples.

The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP).

The groundwater quality field meter(s) used during a sampling event will be calibrated in a manner consistent with the manufacturer's specifications before sampling activities commence and at the start of each day during which groundwater samples will be collected (i.e., a field day). The calibration data will be recorded on the appropriate field form. Instruments will be recalibrated as necessary (e.g., when calibration checks indicate significant variability), and all checks and recalibration steps will be documented on field calibration forms. Calibration of the instruments will also be checked if any readings during sampling activities are suspect. Replacement probes and meters will be obtained as a corrective action in the event that recalibration does not improve instrument function. Calibration field forms will be included in all groundwater monitoring reports.

9. REPORTING RESULTS

A semi-annual groundwater report that documents the results of sampling and analysis will be submitted to GA EPD. Semi-annual groundwater monitoring reports will be submitted to the GA EPD within 90 days of receipt of the groundwater analytical data from the laboratory. At a minimum, semi-annual reports will include:

1. A summary of the site's history and monitoring system status.
2. A brief discussion of the geology/hydrogeology of the site.
3. Groundwater monitoring compliance status.
4. A narrative describing sampling activities and findings including a summary of the number of samples collected, the dates the samples were collected and whether the samples were required by the detection or assessment monitoring programs.
5. A brief overview of purging/sampling methodologies.
6. Comparison to established standards.
7. Discussion of results.
8. Recommendations for the future monitoring consistent with the Rules.
9. Potentiometric surface contour map for the aquifer(s) being monitored, signed and sealed by a Georgia-registered P.G. or P.E.
10. Table of as-built information for groundwater monitoring wells including top of casing elevations, ground elevations, screened elevations, current groundwater elevations and depth to water measurements.
11. Groundwater flow rate and direction calculations.
12. Identification of any groundwater wells that were installed or abandoned during the preceding year, along with a narrative description of why these actions were taken.
13. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
14. If applicable, semi-annual assessment monitoring results.
15. Any alternate source demonstration completed during the previous monitoring period, if applicable.
16. Laboratory Reports.

17. COC documentation.
18. Field sampling logs including field instrument calibration, indicator parameters, and parameter stabilization criteria.
19. Well inspection documentation including well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling.
20. Documentation of non-functioning or dry well locations.
21. Table of current analytical results for each well.
22. Statistical analyses.
23. Certification by a Qualified Groundwater Scientist.

10. STATISTICAL ANALYSIS

Groundwater quality data from each sampling event will be statistically evaluated to determine if there has been a statistically significant change in groundwater chemistry. Historical background data will be used to determine statistical limits.

According to the State CCR Rule Chapter 391-3-4-.10(6)(a), which incorporates the statistical analysis requirements of 40 CFR §257.93 by reference, the Site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each constituent to be evaluated. The statistical test chosen will be conducted separately for each constituent in each well and will be conducted in accordance with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009). As authorized by the rule, statistical tests that will be used include:

1. A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit [§257.93(f)(3)].
2. A control chart approach that gives control limits for each constituent [§257.93(f)(4)].
3. Another statistical test method that meets the performance standards of §257.93(g) [§257.93(f)(5)]. A justification for an alternative method will be placed in the operating record and the Director notified of the use of an alternative test. The justification will demonstrate that the alternative method meets the performance standards of §257.93(g).

Based on site-specific conditions, statistical methods may be intra-well, inter-well, or a combination of both. If inter-well methods are used, the results will compare Appendix III groundwater monitoring data to background conditions. Confidence intervals will be constructed for each downgradient well and used to compare Appendix IV groundwater monitoring data to groundwater protection standards.

A site-specific statistical analysis plan that provides details regarding the statistical methods to be used for the new CCR landfill will be placed in the Site's operating record pursuant to Chapter 391-3-4-.10(6). **Figure 1**, *Statistical Analysis Plan Overview*, presents a flowchart that depicts the process to be followed to develop the site-specific plan. **Figure 2**, *Decision Logic for Computing Tolerance or Prediction Intervals*, presents the logic used to calculate site-specific statistical limits and test compliance results against those limits.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

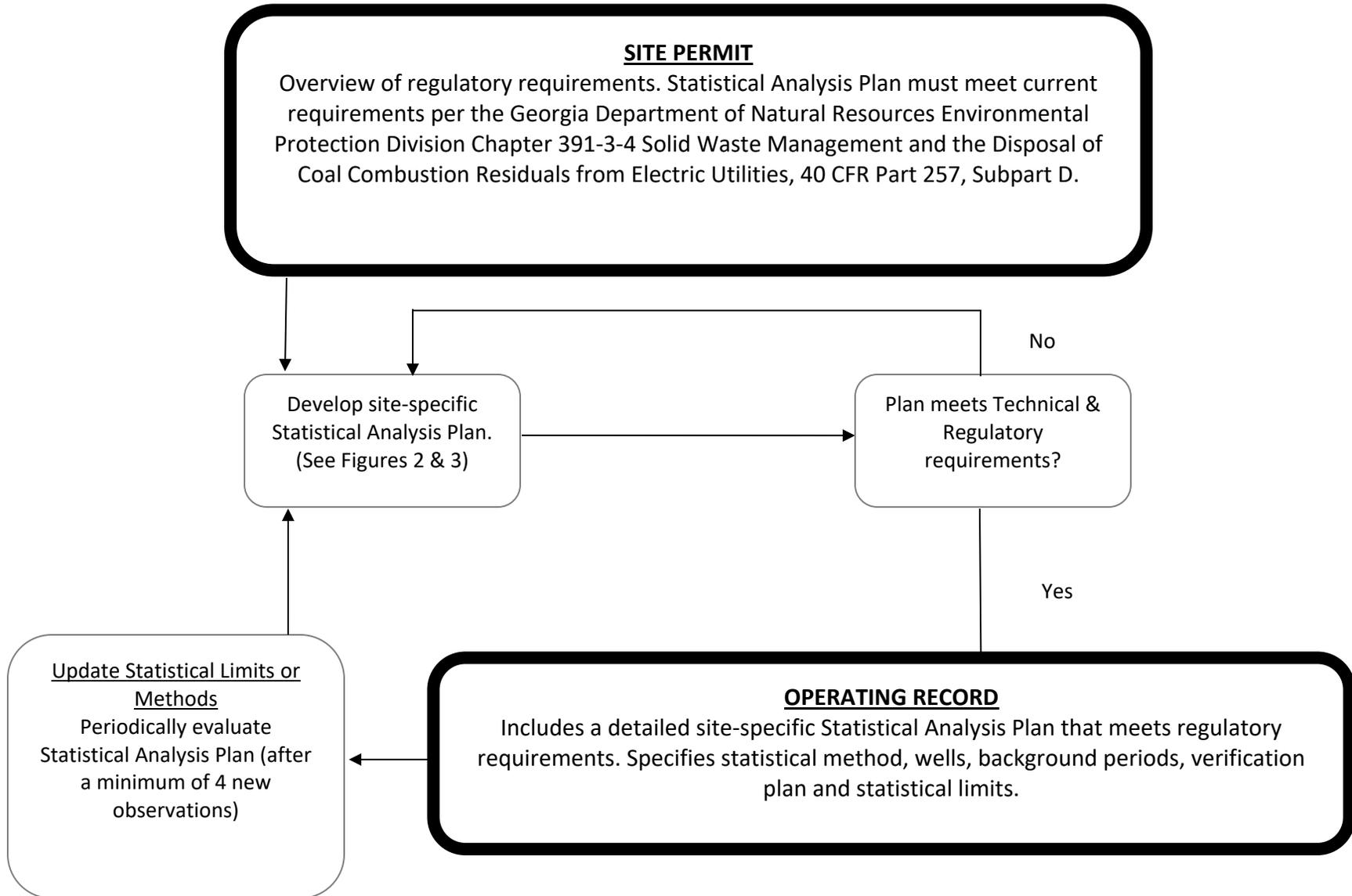
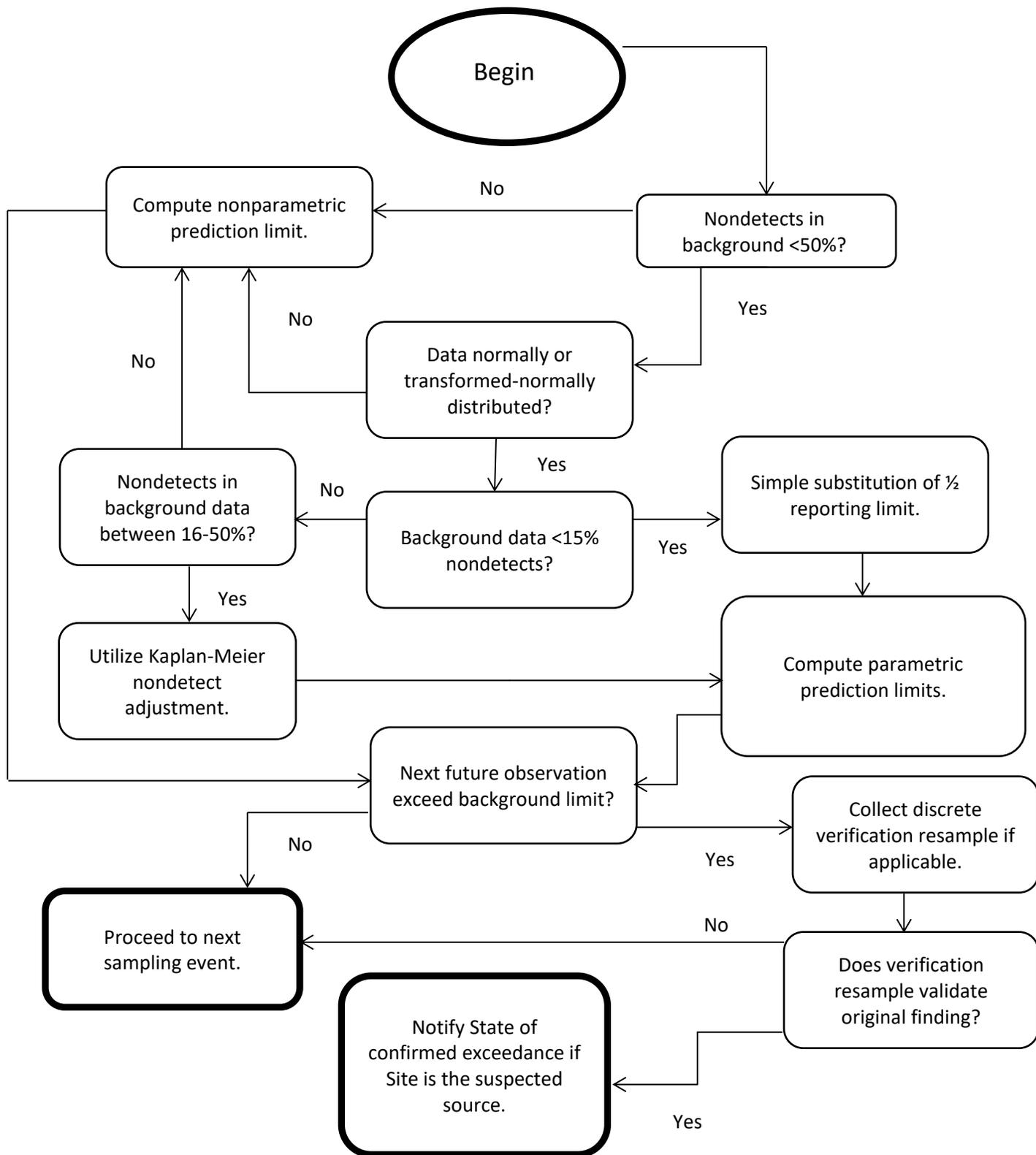


FIGURE 2. DECISION LOGIC FOR COMPUTING TOLERANCE OR PREDICTION INTERVALS



11. REFERENCES

ATC, 2000. Compliance Status Report – Plant Branch Steam Electric Generating Plant. ATC Associates Inc. 27 June 2000.

Georgia Environmental Protection Division (GA EPD), 1991. *Manual for Groundwater Monitoring*. (PP. 38).

Georgia Rules and Regulations, 2018. *Rule Subject 391-3-4, Solid Waste Management*. Revised March 28, 2018.

Geosyntec Consultants, 2019. Site Acceptability Report for Proposed CCR Landfill, Plant Branch, Georgia Power Company. July 2019.

Golder Associates, 2018. *Geologic and Hydrogeologic Summary Report – Georgia Power Plant Branch*. Golder Inc. November 2018.

Official Code of Georgia Annotated, 1985. *O.C.G.A. § 12-5-120. Water Well Standards Act of 1985*.

United States Environmental Protection Agency, 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Resource Conservation and Recovery – Program Implementation and Information Division.

United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2018. *Operating Procedure for Design and Installation of Monitoring Wells*. SESDGUID-101-R2.

United States Environmental Protection Agency, Laboratory Services and Applied Science Division *Field Equipment Cleaning and Decontamination* (LSASDPROC-205-R4). June 2020.

United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2017. *Operating Procedure for Groundwater Sampling*. SESDPROC-304-R4.

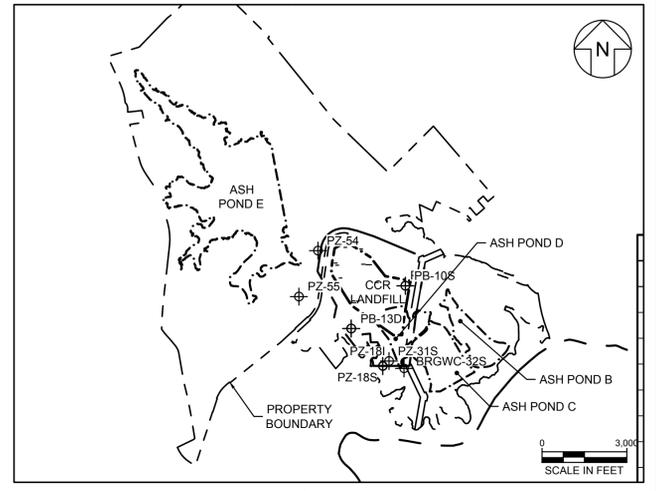
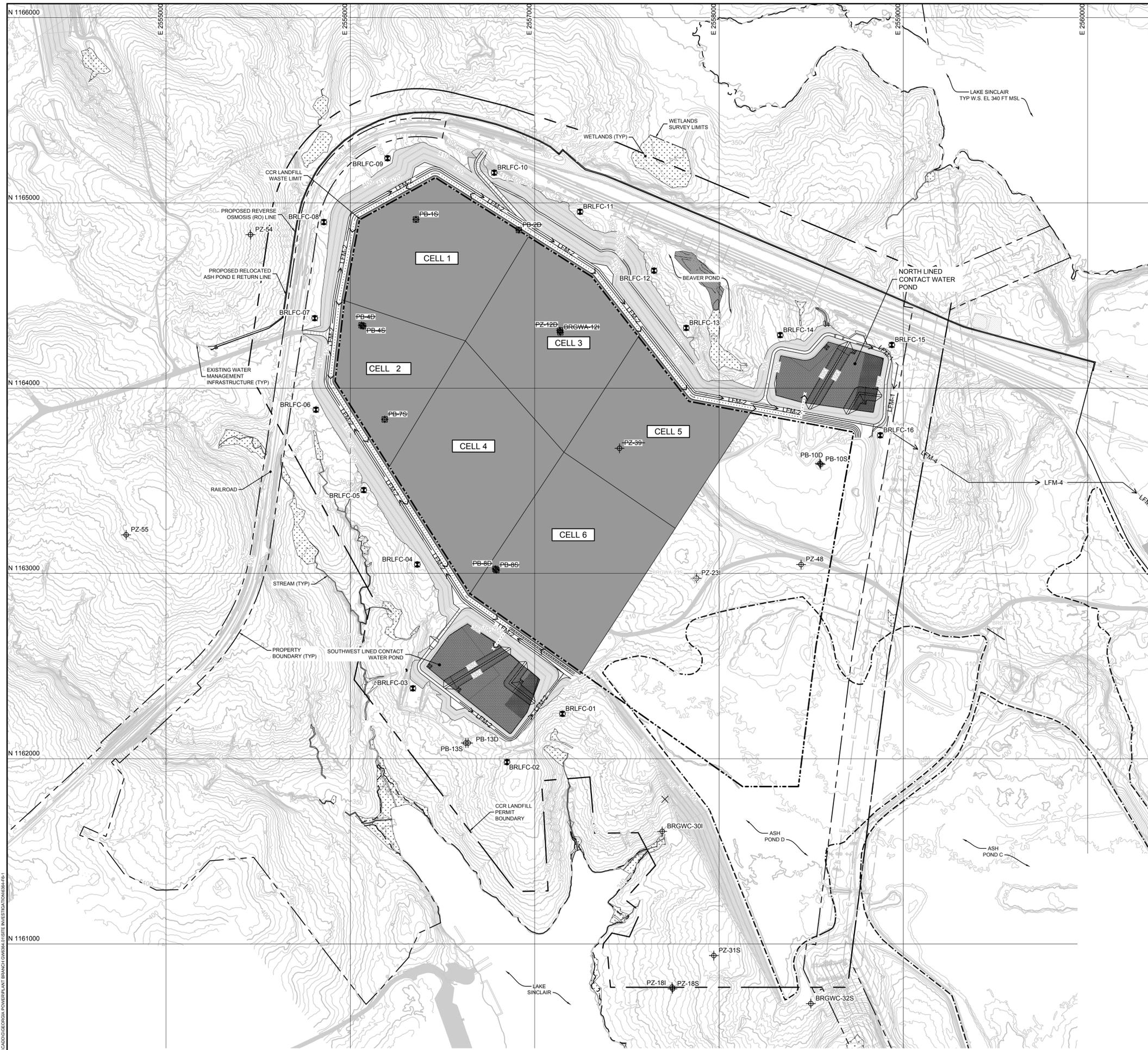
United States Environmental Protection Agency, 2015. *40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule*.

APPENDICES

- A. MONITORING SYSTEM DETAILS
- B. GROUNDWATER MONITORING WELL INFORMATION
- C. GROUNDWATER SAMPLING PROCEDURE

A. MONITORING SYSTEM DETAILS

FIGURE A-1	PROPOSED GROUNDWATER MONITORING NETWORK – PHASE 1
FIGURE A-2	PROPOSED GROUNDWATER MONITORING NETWORK – PHASE 2
FIGURE A-3	POTENTIOMETRIC SURFACE MAP – 31 JANUARY 2019
FIGURE A-4	GEOLOGIC MAP
TABLE A-1	WELL AND PIEZOMETER LOCATION AND CONSTRUCTION DETAILS



LEGEND

- EXISTING MONITORING WELL OR WATER LEVEL PIEZOMETER
- PROPOSED PHASE I MONITORING WELL
- PROPOSED TO BE ABANDONED MONITORING WELL OR WATER LEVEL PIEZOMETER
- CCR PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LIMIT OF WASTE
- WETLAND
- LINED CCR LANDFILL CELL
- CONTACT WATER FLOW DIRECTION
- LEACHATE FORCE MAIN

EXISTING MONITORING WELL OR PIEZOMETER			PHASE I MONITORING WELLS		
WELL ID	NORTHING	EASTING	WELL ID	NORTHING	EASTING
BRGWA-2S	1167139.70	2549952.60	BRLFC-01	1162242.02	2557150.34
BRGWA-5S	1170177.50	2549415.50	BRLFC-02	1161981.31	2556849.81
BRGWA-6S	1170732.90	2551540.80	BRLFC-03	1162379.44	2556339.26
BRGWA-23S	1162970.68	2578668.18	BRLFC-04	1163048.02	2556362.99
BRGWC-30I	1161607.60	2557891.80	BRLFC-05	1163449.76	2556072.26
BRGWC-32S	1160677.70	2558497.90	BRLFC-06	1163883.55	2555813.17
BRGWC-47	1162700.70	2559456.70	BRLFC-07	1164377.60	2555806.51
PB-13D	1162084.45	2556638.75	BRLFC-08	1164896.46	2555856.03
PB-13S	1162084.39	2556626.00	BRLFC-09	1165240.88	2556201.74
PZ-18I	1160766.20	2557745.50	BRLFC-10	1165162.99	2556780.26
PZ-18S	1160757.30	2557747.40	BRLFC-11	1164952.28	2557246.08
PZ-23I	1162974.11	2557878.02	BRLFC-12	1164634.47	2557647.01
PZ-31S	1160936.90	2557971.80	BRLFC-13	1164325.04	2557822.04
PZ-48	1163047.73	2558444.99	BRLFC-14	1164286.26	2558331.65
PZ-54	1164828.70	2555458.30	BRLFC-15	1164233.41	2558936.98
PZ-55	1163208.00	2554783.60	BRLFC-16	1163745.64	2558874.65

- NOTES:**
- MONITORING WELLS WILL BE SCREENED IN THE SAPROLITE AND PARTIALLY WEATHERED ROCK UNITS (IF PRESENT) TO TARGET THE PRIMARY ZONE OF GROUNDWATER FLOW IN THE UPPERMOST AQUIFER.
 - EXISTING WELL LOCATIONS BRGWA-2S, BRGWA-5S, AND BRGWA-6S, LOCATED UPGRADIENT OF ASH POND E, WERE SELECTED AS BACKGROUND LOCATIONS AS THEY ARE SCREENED AT THE APPROPRIATE DEPTHS WITHIN THE SAME GEOLOGIC FORMATION AS THE PROPOSED GROUNDWATER MONITORING NETWORK.
 - EXISTING WELLS AND PIEZOMETERS (BRGWC-30I, BRGWA-23S, BRGWC-47, BRGWC-32S, PB-13S, PB-13D, PZ-18S, PZ-31S, PZ-23I, PZ-48, PZ-54, AND PZ-55) WILL BE USED FOR DEPTH TO WATER MEASUREMENTS AND POTENTIOMETRIC SURFACE EVALUATION. THESE LOCATIONS ARE NOT PART OF THE COMPLIANCE MONITORING WELL NETWORK FOR THE CCR LANDFILL; HOWEVER, PZ-54 AND PZ-55 MAY BE CONSIDERED FOR INCLUSION IN THE NETWORK PENDING FURTHER EVALUATION.
 - GROUNDWATER PIEZOMETERS (PZ-18I, PZ-18S, PZ-23I, PZ-23S, PZ-31S, PZ-48) AND TEMPORARY PIEZOMETERS (PB-13S, PB-13D, PB-4S, PB-4B, PB-6S, PB-6B, PB-10S, PB-10D, AND PB-10I) WILL BE ABANDONED PRIOR TO LANDFILL CONSTRUCTION. MONITORING NETWORK WELLS (BRGWA-12I, BRGWA-12S, BRGWA-23S) WILL BE ABANDONED AND REPLACED WITH NEW WELLS INSTALLED AT LOCATIONS OUTSIDE THE LANDFILL FOOTPRINT, PRIOR TO LANDFILL CONSTRUCTION. THESE WELLS ARE EXPECTED TO BE ABANDONED IN PHASES (I.E. WELLS WITHIN CELLS 1 THROUGH 6 FOOTPRINT WILL BE ABANDONED PRIOR TO PHASE I AND REMAINING ONES WILL BE ABANDONED PRIOR TO PHASE II AS SHOWN IN THIS PLAN. ABANDONMENT WILL BE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GROUNDWATER MONITORING PLAN.



PROPOSED GROUNDWATER MONITORING NETWORK - PHASE 1

PLANT BRANCH CCR LANDFILL
PUTNAM COUNTY, GEORGIA

Geosyntec
consultants

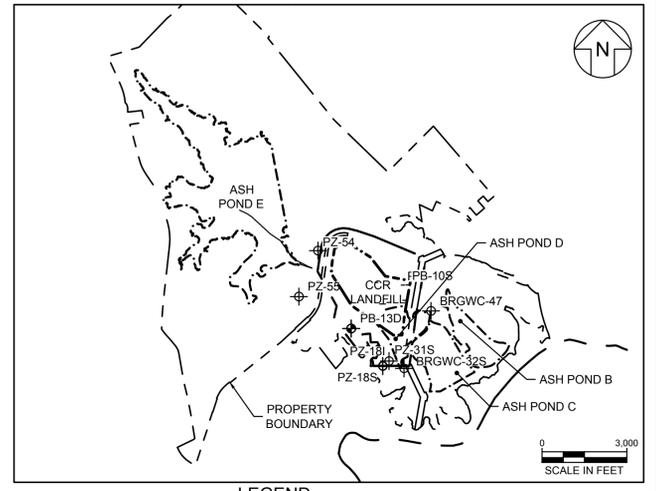
1255 ROBERTS BOULEVARD NW, SUITE 200
KENNESAW, GEORGIA 30144-3694

PHONE: 678.202.9500
WWW.GEOSYNTEC.COM

PROJ. NO.	GW6364	DWG.	6364-F6-1	EDIT	05.11.22
SCALE	1" = 250'				
DATE	MAY 2022				

FIGURE A - 1

L:\CAD\GEORGIA POWER\PLANT BRANCH\GIS\SITE INVESTIGATION\F6-F1



LEGEND

	EXISTING MONITORING WELL OR PIEZOMETER		PROPOSED TO BE ABANDONED MONITORING WELL OR WATER LEVEL PIEZOMETER
	PROPOSED PHASES 1 AND 2 MONITORING WELL		UNDERDRAIN PIPE AND SUMP
	STORMWATER FLOW DIRECTION		CONTACT WATER FLOW DIRECTION
	CCR PERMIT BOUNDARY		LEACHATE FORCEMAIN
	PROPERTY BOUNDARY		INTERIM BERM TO SEPARATE CONTACT WATER AND STORMWATER FLOW
	LIMIT OF WASTE		
	WETLAND		
	LINED CCR LANDFILL CELL		

EXISTING MONITORING WELL OR PIEZOMETERS

WELL ID	NORTHING	EASTING
BRGWA-2S	1167139.70	2549952.60
BRGWA-5S	1170177.50	2549415.50
BRGWA-6S	1170732.90	2551540.80
BRGWC-30I	1161607.60	2557691.80
BRGWC-32S	1160677.70	2558497.90
BRGWC-47	1162700.70	2559456.70
PB-13D	1162084.45	2556638.75
PB-13S	1162084.39	2556626.00
PZ-18I	1160766.20	2557745.50
PZ-18S	1160757.30	2557747.40
PZ-31S	1160936.90	2557971.80
PZ-54	1164828.70	2555458.30
PZ-55	1163208.00	2554783.60

PHASES 1 AND 2 MONITORING WELLS

WELL ID	NORTHING	EASTING
BRLFC-01	1162242.02	2557150.34
BRLFC-02	1161981.31	2556849.81
BRLFC-03	1162379.44	2556339.26
BRLFC-04	1163048.02	2556362.99
BRLFC-05	1163449.76	2556072.26
BRLFC-06	1163883.55	2555813.17
BRLFC-07	1164377.60	2555806.51
BRLFC-08	1164896.46	2555856.03
BRLFC-09	1165240.88	2556201.74
BRLFC-10	1165162.99	2556780.26
BRLFC-11	1164952.28	2557246.08
BRLFC-12	1164634.47	2557647.01
BRLFC-13	1164325.04	2557822.04
BRLFC-14	1164286.26	2558331.65
BRLFC-15	1164233.41	2558936.98
BRLFC-16	1163745.64	2558874.65
BRLFC-17	1163383.08	2558812.41
BRLFC-18	1162880.75	2558700.30
BRLFC-19	1162389.46	2558655.16
BRLFC-20	1161941.00	2558633.71
BRLFC-21	1161610.91	2558489.93
BRLFC-22	1161225.48	2558311.09
BRLFC-23	1161509.38	2557832.88
BRLFC-24	1161780.67	2557706.62
BRLFC-25	1161946.68	2557571.66

- NOTES:**
- MONITORING WELLS WILL BE SCREENED IN THE SAPROLITE AND PARTIALLY WEATHERED ROCK UNITS (IF PRESENT) TO TARGET THE PRIMARY ZONE OF GROUNDWATER FLOW IN THE UPPERMOST AQUIFER.
 - EXISTING WELL LOCATIONS BRGWA-2S, BRGWA-5S, AND BRGWA-6S, LOCATED UPGRADIENT OF ASH POND E, WERE SELECTED AS BACKGROUND LOCATIONS AS THEY ARE SCREENED AT THE APPROPRIATE DEPTHS WITHIN THE SAME GEOLOGIC FORMATION AS THE PROPOSED GROUNDWATER MONITORING NETWORK.
 - EXISTING WELLS AND PIEZOMETERS (BRGWC-30I, BRGWC-47, BRGWC-32S, PB-13S, PB-13D, PZ-18S, PZ-31S, PZ-39, PZ-48, PZ-54, AND PZ-55) WILL BE USED FOR DEPTH TO WATER MEASUREMENTS AND POTENTIOMETRIC SURFACE EVALUATION. THESE LOCATIONS ARE NOT PART OF THE COMPLIANCE MONITORING WELL NETWORK FOR THE CCR LANDFILL; HOWEVER, PZ-54 AND PZ-55 MAY BE CONSIDERED FOR INCLUSION IN THE NETWORK PENDING FURTHER EVALUATION.
 - GROUNDWATER PIEZOMETERS (PZ-11S, PZ-12D, PZ-22S/PZ-39, PZ-23I, PZ-48) AND TEMPORARY PIEZOMETERS (PB-15, PB-20, PB-4S, PB-4D, PB-7S, PB-8S, PB-8D, PB-10S, AND PB-10D) WILL BE ABANDONED PRIOR TO LANDFILL CONSTRUCTION. MONITORING NETWORK WELLS (BRGWA-12I, BRGWA-12S, BRGWA-23S) WILL BE ABANDONED AND REPLACED WITH NEW WELLS INSTALLED AT LOCATIONS OUTSIDE THE LANDFILL FOOTPRINT, PRIOR TO LANDFILL CONSTRUCTION. THESE WELLS ARE EXPECTED TO BE ABANDONED IN PHASES I (I.E., WELLS WITHIN CELLS 1 THROUGH 6 FOOTPRINT) WILL BE ABANDONED PRIOR TO PHASE I AND REMAINING ONES WILL BE ABANDONED PRIOR TO PHASE II AS SHOWN IN THIS PLAN. ABANDONMENT WILL BE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GROUNDWATER MONITORING PLAN.



PROPOSED GROUNDWATER MONITORING NETWORK - PHASE 2

PLANT BRANCH CCR LANDFILL
PUTNAM COUNTY, GEORGIA

Geosyntec consultants

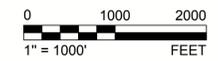
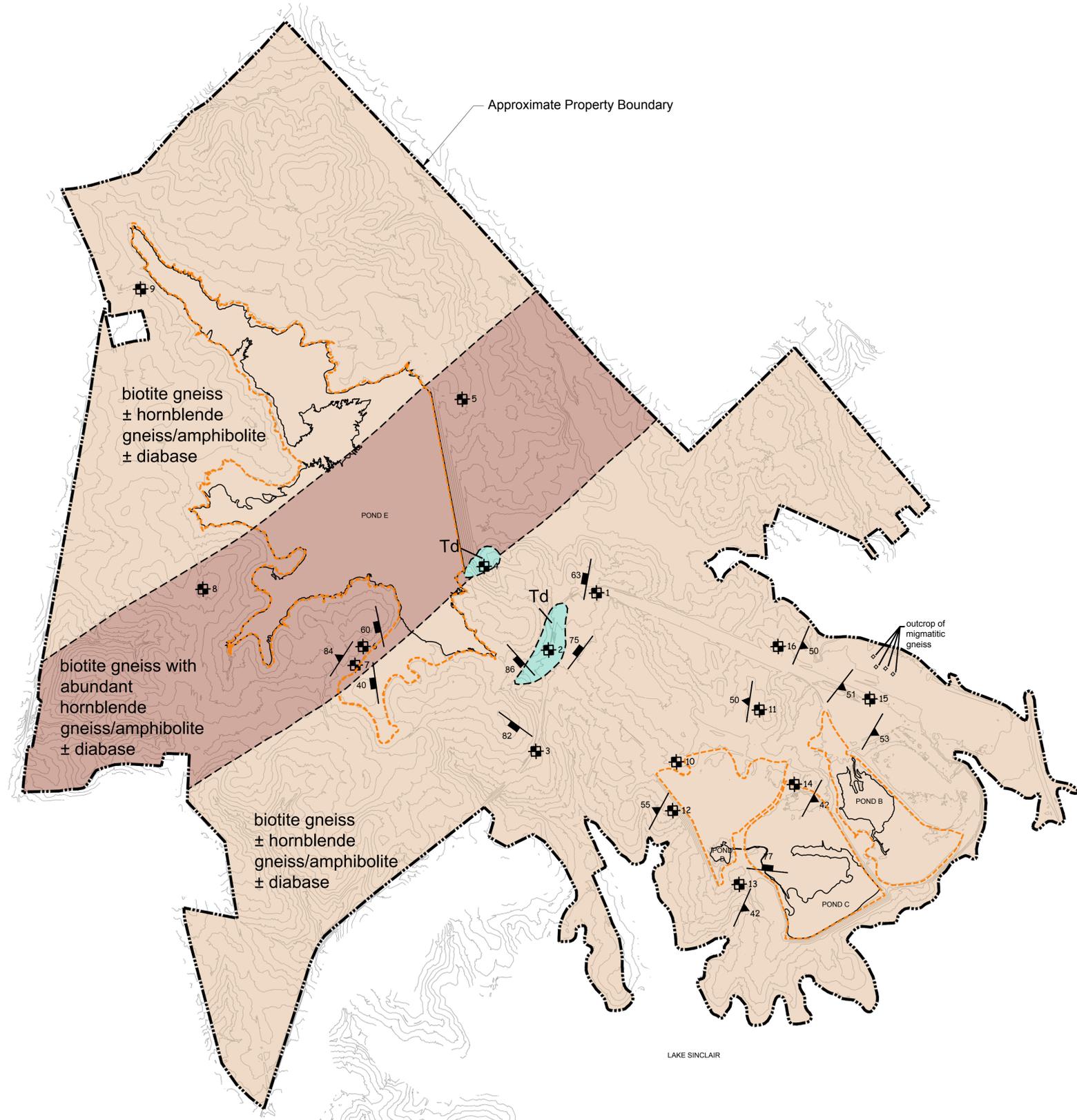
1255 ROBERTS BOULEVARD NW, SUITE 200
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PHONE: 678.202.9500
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DATE	MAY 2022				

FIGURE A - 2

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LEGEND

	APPROXIMATE PROPERTY BOUNDARY		DIABASE DIKE
	ESTIMATED EXTENT OF SURFACE IMPOUNDMENTS		BIOTITE GNEISS
	INTERPRETED GEOLOGIC CONTACT		BIOTITE GNEISS WITH INTERLAYERED AMPHIBOLITE
	JOINTS		
	FOLIATION		
	GEOLOGIC MAP STATION		

- REFERENCES**
1. PROPERTY LINE PROVIDED BY SOUTHERN COMPANY SERVICES, INC.
 2. TOPOGRAPHY OBTAINED BY NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION WEBSITE, www.coast.noaa.gov, JUNE 2016.
 3. GEOLOGIC MAPPING CONDUCTED BY PETROLOGIC SOLUTIONS, INC. IN 2016.
 4. SURFACE IMPOUNDMENT EXTENT PROVIDED BY SOUTHERN COMPANY SERVICES.

CLIENT		
CONSULTANT		
	YYYY-MM-DD	2018-10-23
	DESIGNED	DLP
	PREPARED	DJC
	REVIEWED	RPK
	APPROVED	DLP

PROJECT	GEOLOGIC AND HYDROGEOLOGIC SUMMARY REPORT PLANT BRANCH	
TITLE	GEOLOGIC MAP	
PROJECT NO.	166625418	REV. 0
FIGURE	A-4	

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

Table A-1
Well and Piezometer Location and Construction Details
Plant Branch CCR Landfill
Putnam County, Georgia

Well/Piezometer ID	Easting	Northing	Ground Surface Elevation (ft MSL)	TOC Elevation (ft MSL)	Top of Screen Elevation (ft MSL)	Bottom of Screen Elevation (ft MSL)	Well Depth (ft bgs)	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Monitoring Designation
Existing Groundwater Monitoring Wells										
BRGWA-2S	2549952.6	1167139.7	440.40	443.20	406.20	396.20	44.6	34.2	44.2	Upgradient (Ash Pond E)
BRGWA-5S	2549415.5	1170177.5	440.80	443.86	411.20	401.20	40.0	29.6	39.6	Upgradient (Ash Pond E)
BRGWA-6S	2551540.8	1170732.9	455.80	458.96	416.70	406.70	49.5	39.1	49.1	Upgradient (Ash Pond E)
BRGWA-12I	2557138.9	1164301.2	431.50	434.39	364.30	354.30	77.6	67.2	77.2	Upgradient (Ash Ponds B, C, D)
BRGWA-12S	2557142.9	1164286.6	431.60	434.64	383.70	373.70	58.3	47.9	57.9	Upgradient (Ash Ponds B, C, D)
BRGWA-23S	2557868.1	1162971.7	425.50	428.24	394.90	384.90	41.0	30.6	40.6	Upgradient (Ash Ponds B, C, D)
BRGWC-30I	2557691.8	1161607.6	350.00	352.61	340.15	330.15	20.3	9.9	19.9	Downgradient (Ash Pond D)
BRGWC-32S	2558497.9	1160677.7	403.60	406.39	369.00	359.00	45.0	34.6	44.6	Downgradient (Ash Pond D)
BRGWC-47	2559456.7	1162700.7	408.80	411.20	322.20	312.20	97.0	86.6	96.6	Downgradient (Ash Pond D)
Existing Water Level Piezometers										
PZ-11S	2557002.5	1162467.3	390.90	393.99	376.80	366.80	24.5	14.1	24.1	Site-wide Water Levels
PZ-12D	2557136.4	1164311.9	431.40	434.09	350.10	290.10	141.7	81.3	141.3	Site-wide Water Levels
PZ-18S	2557747.4	1160757.3	359.70	362.82	345.60	335.60	24.2	14.1	24.1	Site-wide Water Levels
PZ-18I	2557745.5	1160766.2	359.60	362.55	331.30	321.30	38.8	28.3	38.3	Site-wide Water Levels
PZ-23I	2557877.7	1162975.4	425.10	427.74	368.60	358.60	67.0	56.5	66.5	Site-wide Water Levels
PZ-31S	2557971.8	1160936.9	374.30	376.77	344.80	334.80	39.5	29.5	39.5	Site-wide Water Levels
PZ-39	2557460.5	1163675.4	432.00	434.78	397.30	387.30	56.5	34.7	44.7	Site-wide Water Levels
PZ-46	2560559.0	1162756.2	382.10	384.64	346.50	336.50	47.0	35.6	45.6	Site-wide Water Levels
PZ-48	2558444.6	1163046.7	418.30	420.90	361.70	351.70	67.0	56.6	66.6	Site-wide Water Levels
PZ-54	2555458.3	1164828.7	440.80	443.86	398.80	388.80	52.0	42.0	52.0	Site-wide Water Levels
PZ-55	2554783.6	1163208.0	450.20	453.07	410.90	400.90	49.3	39.3	49.3	Site-wide Water Levels
PB-1S	2556355.9	1164910.5	400.40	403.16	372.40	362.40	38.4	28.0	38.0	Temporary Water Levels
PB-2D	2556914.2	1164853.6	414.90	416.71	367.90	357.90	57.4	47.0	57.0	Temporary Water Levels
PB-4S	2556069.2	1164335.1	409.30	411.15	371.30	361.30	48.4	38.0	48.0	Temporary Water Levels
PB-4D	2556060.7	1164339.6	409.00	412.12	304.90	294.90	114.5	104.1	114.1	Temporary Water Levels
PB-7S	2556186.2	1163831.3	399.70	402.88	376.70	366.70	33.4	23.0	33.0	Temporary Water Levels
PB-8S	2556792.3	1163018.2	389.60	401.82	364.60	354.60	35.4	25.0	35.0	Temporary Water Levels
PB-8D	2556786.7	1163024.4	398.20	401.74	304.20	294.20	104.4	94.0	104.0	Temporary Water Levels
PB-10S	2558551.2	1163588.9	397.60	400.91	374.60	364.60	33.4	23.0	33.0	Temporary Water Levels
PB-10D	2558546.7	1163593.4	397.50	400.31	322.50	312.50	85.4	75.0	85.0	Temporary Water Levels
PB-13S	2556626.1	1162084.4	370.80	373.31	330.80	320.80	50.4	40.0	50.0	Temporary Water Levels
PB-13D	2556638.8	1162084.5	371.10	373.77	284.10	274.10	97.4	87.0	97.0	Temporary Water Levels
Proposed Monitoring Well Network										
BRLFC-01	2557150.3	1162242.0	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-02	2556849.8	1161981.3	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-03	2556339.3	1162379.4	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-04	2556363.0	1163048.0	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-05	2556072.3	1163449.8	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-06	2555813.2	1163883.6	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-07	2555806.5	1164377.6	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-08	2555856.0	1164896.5	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-09	2556201.7	1165240.9	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-10	2556780.3	1165163.0	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-11	2557246.1	1164952.3	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-12	2557647.0	1164634.5	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-13	2557822.0	1164325.0	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-14	2558331.6	1164286.3	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-15	2558937.0	1164233.4	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-16	2558874.6	1163745.6	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-17	2558812.4	1163383.1	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-18	2558700.3	1162880.8	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-19	2558655.2	1162389.5	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-20	2558633.7	1161941.0	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-21	2558489.9	1161610.9	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-22	2558311.1	1161225.5	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-23	2557832.9	1161509.4	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-24	2557706.6	1161780.7	--	--	--	--	--	--	--	Proposed Downgradient Well
BRLFC-25	2557571.7	1161946.7	--	--	--	--	--	--	--	Proposed Downgradient Well

- Notes:**
ID = Identification
ft MSL = Feet above Mean Sea Level
TOC = Top of Casing
ft bgs = Feet below ground surface
1. Table only includes wells and piezometers at or within the immediate vicinity of the CCR landfill site, or wells proposed to be used for the monitoring network
2. Temporary piezometers were installed by Geosyntec from December 2018 to January 2019
3. Northing and Easting are in feet in the Georgia State Plane West system

B. GROUNDWATER MONITORING WELL INFORMATION

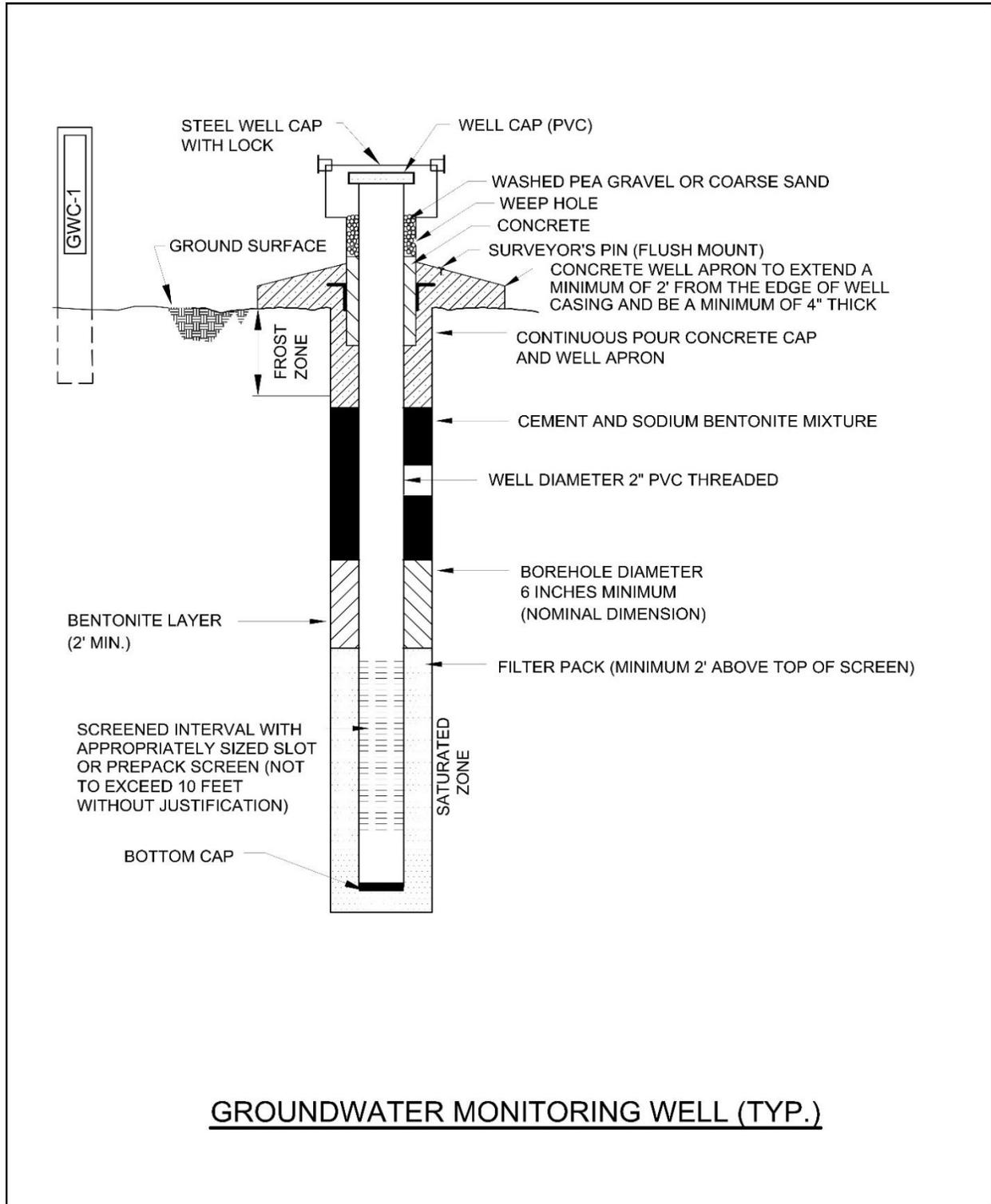
B-1 GROUNDWATER MONITORING WELL DETAIL

B-2 DRILLERS PERFORMANCE BONDS

B-3 SURVEYOR CERTIFICATION

B-4 BORING LOGS

GROUNDWATER MONITORING WELL DETAIL



DRILLERS PERFORMANCE BONDS

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, 2017
(MONTH-DAY-YEAR)

and ending on June 30, 2018
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

DRAFT

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 May 04, 2017
(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. 7710213

American States Insurance Company
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 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, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle

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 4th day of April, 2017.



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 4th day of April, 2017, 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
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-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions 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, whenever 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 4th day of May, 2017.



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.

SURETY RIDER

To be attached to and form a part of

Bond No. 800031223

Type of

Bond: Performance Bond for Water Well Contractors

dated

effective June 30, 2017
(MONTH-DAY-YEAR)

executed by Michael C. Rice/Cascade Drilling, L.P. . as Principal,
(PRINCIPAL)

and by Atlantic Specialty Insurance Company . as Surety,

in favor of State of Georgia
(OBLIGEE)

in consideration of the mutual agreements herein contained the Principal and the Surety hereby consent to changing

Coverage under the bond to include:
Michael Coleman

DRAFT

Nothing herein contained shall vary, alter or extend any provision or condition of this bond except as herein expressly stated.

This rider

is effective December 21, 2017
(MONTH-DAY-YEAR)

Signed and Sealed December 21, 2017
(MONTH-DAY-YEAR)

Michael C. Rice/Cascade Drilling, L.P.
(PRINCIPAL)

By: _____
(PRINCIPAL)

Atlantic Specialty Insurance Company

By: *Elizabeth R. Hahn*
Elizabeth R. Hahn, Attorney-in-Fact



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, Jill A. Wallace, 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**, 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 twenty-fifth day of September, 2012:

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.

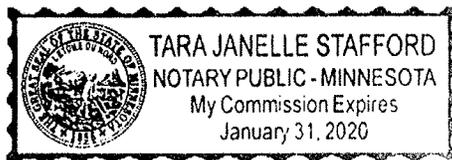
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this eighth day of December, 2014.



By 
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this eighth day of December, 2014, 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.

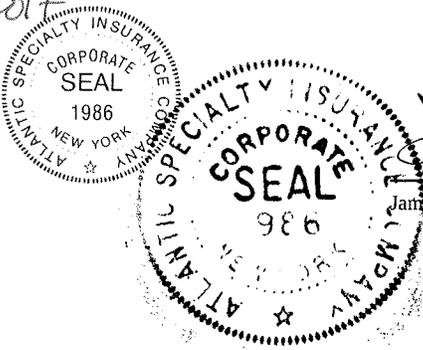



Notary Public

I, the undersigned, Assistant 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 21 day of December, 2017

This Power of Attorney expires
October 1, 2019




James G. Jordan, Assistant Secretary

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 Obligee, 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.

DRAFT

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 Obligee; provided that the rights of the obligee 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

SURETY RIDER

To be attached to and form a part of

Bond No. 800031223

Type of

Bond: Performance Bond for Water Well Contractors

dated

effective June 30, 2017
(MONTH-DAY-YEAR)

executed by Michael C. Rice/Cascade Drilling, L.P. . as Principal,
(PRINCIPAL)

and by Atlantic Specialty Insurance Company . as Surety,

in favor of State of Georgia
(OBLIGEE)

in consideration of the mutual agreements herein contained the Principal and the Surety hereby consent to changing

Coverage under the bond to include:
Michael Coleman

DRAFT

Nothing herein contained shall vary, alter or extend any provision or condition of this bond except as herein expressly stated.

This rider

is effective December 21, 2017
(MONTH-DAY-YEAR)

Signed and Sealed December 21, 2017
(MONTH-DAY-YEAR)

Michael C. Rice/Cascade Drilling, L.P.
(PRINCIPAL)

By: _____
(PRINCIPAL)

Atlantic Specialty Insurance Company

By: *Elizabeth R. Hahn*
Elizabeth R. Hahn, Attorney-in-Fact



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, Jill A. Wallace, 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**, 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 twenty-fifth day of September, 2012:

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.

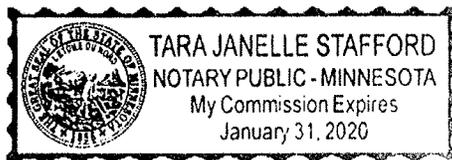
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this eighth day of December, 2014.

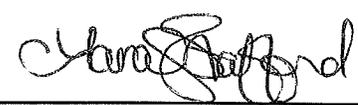


By 
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

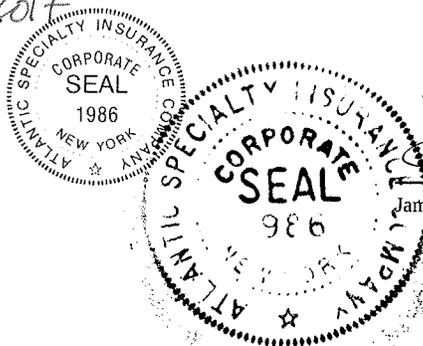
On this eighth day of December, 2014, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, 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.

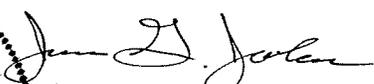



Notary Public

I, the undersigned, Assistant 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 21 day of December, 2017




James G. Jordan, Assistant Secretary

This Power of Attorney expires
October 1, 2019

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, 2017
(MONTH-DAY-YEAR)

and ending on June 30, 2018
(MONTH-DAY-YEAR)

Amount of bond \$10,000.00

DRAFT

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 May 04, 2017
(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. 7710213

American States Insurance Company
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 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, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle

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 4th day of April, 2017.



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 4th day of April, 2017, 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
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-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions 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, whenever 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 4th day of May, 2017.



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.

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 **DRAFT**

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 Snider

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

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 Obligee, 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.

DRAFT

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 Obligee; provided that the rights of the obligee 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

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:

CONTINUATION CERTIFICATE **DRAFT**

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 Snider

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

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)

DRAFT

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.

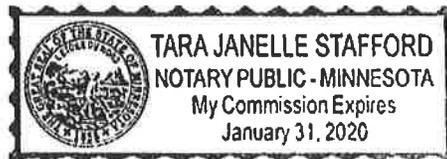
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-sixth day of October, 2017.

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

Bond Number 1001126889

Performance Bond For Drillers

Name of Driller Phillip Pitts and Stan White

Know All Men By These Presents

That we Phillip Pitts and Stan White and Thompson Engineering, Inc. any and all employees, officers and partners (collectively hereinafter, **Principal**), and we American Contractors Indemnity Company, duly organized under the laws of the State of California (hereinafter, **Surety**), are held and firmly bound unto the Director of the Environmental Protection Division, Department of Natural Resources, State of Georgia (**Director**) and his or her Successor or Successors in office, as **Obligee**, in the full sum of **FIFTEEN THOUSAND DOLLARS (\$15,000.00)** for the payment of which will and truly to be made, the Principal and Surety bind ourselves, our heirs, administrators, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Water Well Standards Act of 1985 (O.C.G.A. §§ 12-5-120 *et seq.*) (the Act) requires that a Driller, as that term is defined by the Act, have a performance bond 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 it shall remain in 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 the 1st day of November, 2018 and shall continue in effect until June 30, 2019, unless sooner terminated by mutual agreement of Principal and Surety, provided that no such termination may be made unless sixty (60) days' prior written notice is made to the Director. In the event of such termination, the rights of the Director as Obligee and beneficiaries under this bond which arose prior to such termination shall continue.

IN WITNESS THEREOF the Principal and Surety have caused these present to be duly signed and sealed, this the 26th day of February, 2019.

Principal
Thompson Engineering, Inc.

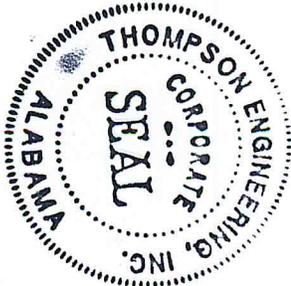
Surety
American Contractors Indemnity Company

Print name: Chad R. Brown
Title: CLO + Secretary

Print name: Dewey Brashier
Title: Attorney-in-Fact

Seal:

Seal:





**TOKIOMARINE
HCC**

**POWER OF ATTORNEY
AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY**

KNOW ALL MEN BY THESE PRESENTS: That American Contractors Indemnity Company, a California corporation, Texas Bonding Company, an assumed name of American Contractors Indemnity Company, United States Surety Company, a Maryland corporation and U.S. Specialty Insurance Company, a Texas corporation (collectively, the "Companies"), do by these presents make, constitute and appoint:

Jim E. Brashier, Troy P. Wagener, Loren Richard Howell, Jr., Dewey Brashier,
Kathleen B. Scarborough, Susan Skrmetta, John W. Nance

its true and lawful Attorney(s)-in-fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed *****Unlimited***** Dollars (***unlimited***). This Power of Attorney shall expire without further action on April 23rd, 2022. This Power of Attorney is granted under and by authority of the following resolutions adopted by the Boards of Directors of the Companies:

Be it Resolved, that the President, any Vice-President, any Assistant Vice-President, any Secretary or any Assistant Secretary shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements or indemnity and other conditional or obligatory undertakings, including any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts, and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be binding upon the Company as if signed by the President and sealed and effected by the Corporate Secretary.

Be it Resolved, that the signature of any authorized officer and seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, The Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 1st day of June, 2018.

**AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY**

State of California
County of Los Angeles



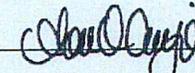
By: 
Daniel P. Aguilar, Vice President

A Notary Public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On this 1st day of June, 2018, before me, Sonia O. Carrejo, a notary public, personally appeared Daniel P. Aguilar, Vice President of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature  (seal)



I, Kio Lo, Assistant Secretary of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Los Angeles, California this 26th day of February, 2019.

Corporate Seals
Bond No. 1001126889
Agency No. 17033




Kio Lo, Assistant Secretary

SURVEYOR CERTIFICATION



1469 HIGHWAY 20 WEST • McDONOUGH, GA 30253
phone: 770-707-0777 fax: 770-707-0755
WWW.METRO-ENGINEERING.COM

SURVEYOR'S REPORT

SCOPE OF WORK:

Field survey of existing monitoring wells at Georgia Power Company, Plant Branch in Milledgeville, GA.

Horizontal and vertical datum was derived from RTK GPS observations with corrections from the eGPS network and conventional surveying equipment. Horizontal datum is Georgia State Plane, West Zone, NAD83(2011) and vertical datum is NAVD88.

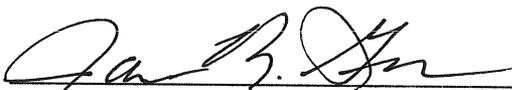
DRAFT

EQUIPMENT USED TO ESTABLISH THE MONITORING WELL LOCATIONS:

Trimble R8 Dual Frequency GPS Receiver
Leica TS16 Total Station
Leica DNA10 Digital Level

CERTIFICATION:

I hereby certify that the center of well casing (PVC) has a horizontal accuracy of 0.5+/- feet or better using a Trimble R8 Dual Frequency RTK (survey-grade) global positioning system receiver referencing the Georgia State Plane, west zone, NAD83(2011) coordinate system in US survey feet. The top of well casing (PVC) elevation data was determined in feet above mean sea level based on the NAVD88 vertical datum. Vertical data was confirmed to be accurate within 0.01 foot through establishment of a closed level check loop with a Leica DNA10 digital level having a published accuracy of 0.9mm per dual-traverse kilometer.


James R. Green R.L.S. No. 2543



Date: 7/23/20

BORING LOGS



BORING LOG

BORING BRGWA-2S/PZ-02 S

Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DATE STARTED 4/2/2014 COMPLETED 4/2/2014 GROUND ELEVATION 440.4 ft COORDINATES N 1167139.7 E 2549952.6

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 44.6 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 10.2 ft. after 288 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			440.4				Top of casing Elev. = 443.20
5		See PZ-02 1 for material descriptions					
10							
15							
20							
25							
30							
35							Annular Seal
							Filter Pack
40							
							Screen

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\APARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ

Bottom of borehole at 44.6 feet.



BORING LOG

BORING BRGWA-5S/PZ-05 S

Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study

LOCATION Milledgeville, GA

DATE STARTED 4/3/2014 COMPLETED 4/3/2014 GROUND ELEVATION 440.8 ft COORDINATES N 1170177.5 E 2549415.5

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 40 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 10 ft. after 250 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA	
				75	150	225	Top of casing Elev. = 443.86	
440.8			440.8					
5		See PZ-05 I for material descriptions						
10		See PZ-5 I for material descriptions						
15								
20								
25								
30								
35								
40								
Bottom of borehole at 40.0 feet.								

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\APARKER\DESKTOP\PI\GFC\PLANT BRANCH PIEZOMETERS.GPJ

Annular Seal

Filter Pack

Screen Tip Elevation



BORING LOG

BORING BRGWA-6S/PZ-06 S
Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

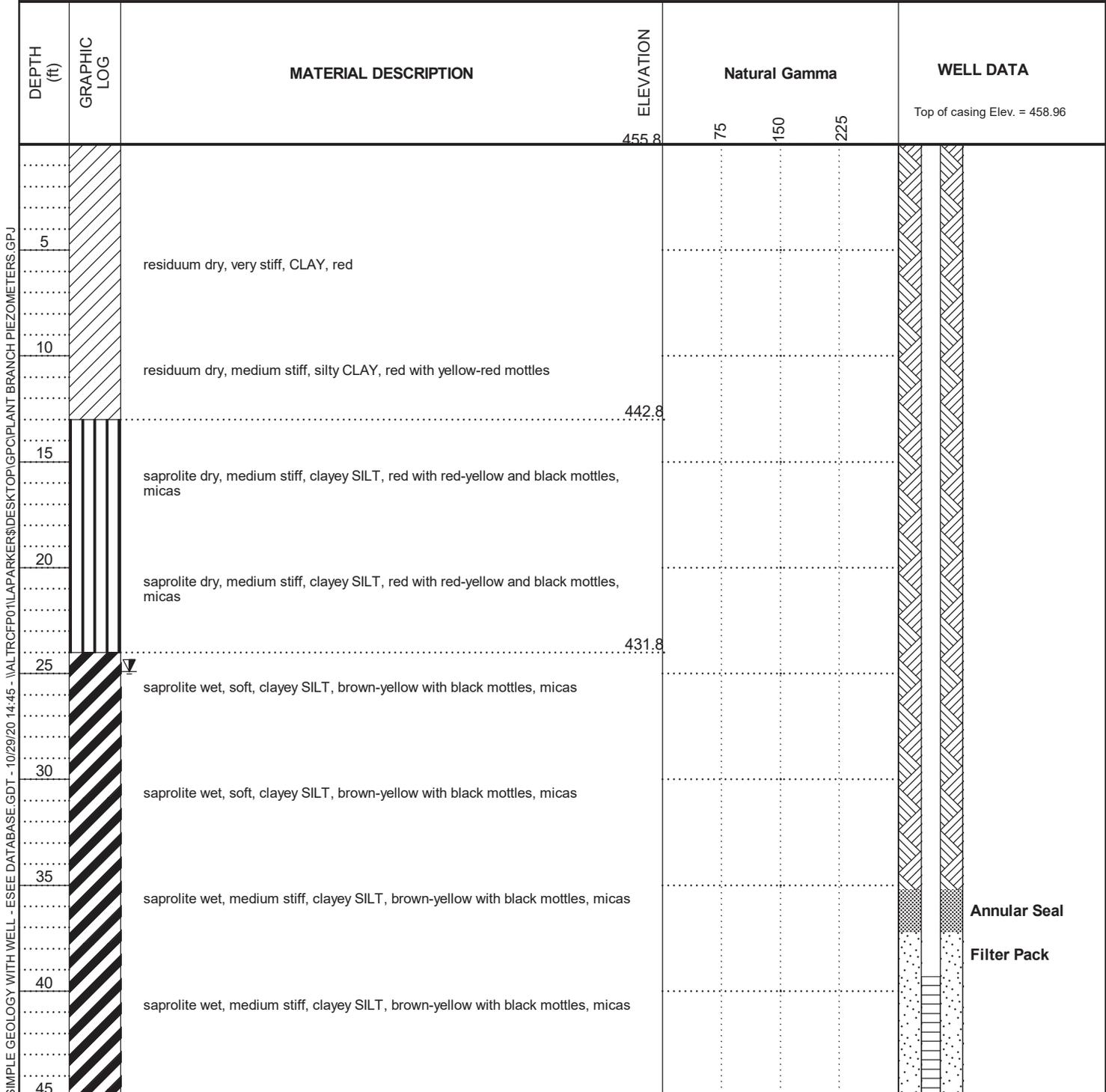
DATE STARTED 4/1/2014 COMPLETED 4/1/2014 GROUND ELEVATION 455.8 ft COORDINATES N 1170732.9 E 2551540.8

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 51 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 24.9 ft. after 300 hrs.

NOTES _____



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 10/29/20 14:45 - \\ALTRCFP01\LPARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ



BORING LOG

BORING BRGWA-6S/PZ-06 S
Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	Top of casing Elev. = 458.96 (CONTINUED)
50		saprolite wet, stiff, clayey SILT, olive-yellow with gray mottles, sand (Cont)	455.8				 Screen Tip Elevation
		saprolite wet, medium stiff, clayey SILT, olive-gray with brown mottles	404.8				

Bottom of borehole at 51.0 feet.

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\LAPARKER\DESKTOP\PIANT BRANCH PIEZOMETERS.GPJ



BORING LOG

BORING BRGWA-12S/PZ-12 S

Page 1 of 2

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study

LOCATION Milledgeville, GA

DATE STARTED 3/4/2014 COMPLETED 3/4/2014 GROUND ELEVATION 431.6 ft COORDINATES N 1164286.6 E 2557142.9

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger; Casing Advance EQUIPMENT CME 550

DRILLED BY T. Milam LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 58.3 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 47.5 ft. after 300 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA	
				75	150	225		
			431.6				Top of casing Elev. = 434.64	
5		See PZ-12 D and PZ-12 I for material descriptions						
10								
15								
20								
25								
30								
35								
40								
45								Annular Seal

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCF001\LAPARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ



BORING LOG

BORING BRGWA-12S/PZ-12 S

Page 2 of 2

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study

LOCATION Milledgeville, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			431.6				Top of casing Elev. = 434.64
50							(CONTINUED) Filter Pack Screen Tip Elevation
55							
Bottom of borehole at 58.3 feet.							

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\LAPARKER\DESKTOP\GFCIPLANT BRANCH PIEZOMETERS.GPJ



BORING LOG

BORING BRGWA-12I/PZ-12 I

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study

LOCATION Milledgeville, GA

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCF001\APARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			431.5				Top of casing Elev. = 434.39
50		damp, stiff, clayey SILT, pale brown with white and red mottles, sand, micas (Cont)					(CONTINUED)
55		wet, stiff, clayey SILT, very pale brown with white mottles, sand, micas					
60		wet, hard, clayey SILT, pale brown with white mottles, sand, micas					
65		wet, hard, sandy SILT, hard, pale gray-brown, micas					Annular Seal
70		wet, hard, sandy SILT, light olive-brown, micas Felsic biotite GNEISS medium to coarse grain, moderately weathered, flow banded, numerous fractures, dark gray, black-white banding, feldspar, quartz, biotite	366.8				Filter Pack
75		medium to coarse grain, not weathered, flow banded, few fractures, distinct black-white banding, feldspar, quartz, biotite, feldspar phenocrysts					
		medium to coarse grain, not weathered, flow banded, few fractures, distinct black-white banding, feldspar, quartz, biotite, feldspar phenocrysts	353.9				Screen Tip Elevation

Bottom of borehole at 77.6 feet.

Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-23S/BRGWA-23S

SHEET 1 of 1

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 41.00 ft
 LOCATION: Milledville, GA

DRILL RIG: Mini-Sonic Track Mounted Rig
 DATE STARTED: 7/25/16
 DATE COMPLETED: 7/26/16

NORTHING: 1,162,971.70
 EASTING: 2,557,868.10
 GS ELEVATION: 425.5
 TOC ELEVATION: 428.24 ft

DEPTH W.L.: 27.2
 ELEVATION W.L.: 401.22
 DATE W.L.: 7/25/16
 TIME W.L.: na

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	425	0.00 - 5.00 SILT, NP, reddish brown, white mottling, highly weathered, massive, friable, relic foliation structure micaceous, SAPROLITE; cohesive, dry, very stiff	ML			1		5.00 5.00	<p>WELL CASING Interval: 0'-30.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 30.8'-40.8' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 27.5'-40.0' Type: 27.5'-28.5', 30/45 fine sand; 28.5'-40.0', #1 sand</p> <p>FILTER PACK SEAL Interval: 22.5'-27.5' Type: 22.5'-25.5', 3/8" Bentonite Chips; 25.5'-27.5', Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 2.0'-22.5' Type: Portland Cement (Type I)</p> <p>WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>	<p>WELL CONSTRUCTION DETAILS</p>
5	420	5.00 - 19.00 SILT, low plasticity; reddish brown, white mottling, massive, semi-friable, micaceous, SAPROLITE; cohesive, moist, soft			420.5 5.00	2		5.00 5.00		
10	415					3		5.00 5.00		
15	410					4		5.00 5.00		
20	405	19.00 - 20.00 trace fine-coarse subangular sand, pinkish brown			406.5 19.00 405.5					
20	405	20.00 - 28.00 NP, well graded; reddish brown, light brown, dark grey, white mottling, moderately weathered, massive, micaceous, SAPROLITE; cohesive, moist, very soft			20.00	5		5.00 5.00		
25	400					6		5.00 5.00		
30	395	28.00 - 31.40 silty SAND, fine grained sand, NP, trace coarse subangular grain sand; reddish brown, white mottling, moderately weathered, massive, micaceous, SAPROLITE; cohesive, moist, very soft	SM		397.5 28.00					
30	395	31.40 - 35.00 SAND, poorly graded, very fine grained, few silt, trace subangular medium grain sand; light grey, brown, white mottling, medium weathered, massive, micaceous, SAPROLITE; non-cohesive, moist, loose	SP		394.1 31.40	7		5.00 5.00		
35	390	35.00 - 37.00 SAND, poorly graded, fine grained, trace silt; light grey brown, white mottling, highly weathered quartz nodules, heterogenous, micaceous, SAPROLITE; NC, moist-wet, very loose			390.5 35.00	8		2.00 2.00		
35	390	37.00 - 40.50 TRANSITIONALLY WEATHERED ROCK, biotite GNEISS, moderately weathered, banded, dark grey, coarsely crystalline, strong rock, iron oxide staining, Sand part of weathered matrix	TWR		388.5 37.00	9		4.00 4.00		
40	385	40.50 - 41.00 BEDROCK, biotite GNEISS, slightly weathered, banded, grey to light tan, medium crystalline, highly competent rock Boring completed at 41.00 ft	GNEISS		385					

BOREHOLE RECORD PLANT BRANCH LOGS2 SURVEY UPDATED.GPJ_PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Scotty Vermillion

GA INSPECTOR: Will Ethier
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-301/BRGWC-301

SHEET 1 of 1

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 20.25 ft
 LOCATION: Milledville, GA

DRILL RIG: Mini-Sonic Track Mounted Rig
 DATE STARTED: 7/18/16
 DATE COMPLETED: 7/18/16

NORTHING: 1,161,607.60
 EASTING: 2,557,691.80
 GS ELEVATION: 350.0
 TOC ELEVATION: 352.61 ft

DEPTH W.L.: 1.55
 ELEVATION W.L.: 350.78
 DATE W.L.: 7/20/2016
 TIME W.L.: 08:57

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	350	0.00 - 4.70 Sandy CLAYEY SILT, low plasticity fines, fine to medium sub-angular sand, trace organics (roots); moderate reddish brown (10YR 4/6), cohesive, w<PL, soft	ML							WELL CASING Interval: 0'-10' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 10'-20' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 7.0'-20.25' Type: 7.0'-8.0' 30/45 Sand - 8.0'-20.25' #1 Sand FILTER PACK SEAL Interval: 2.0'-7.0' Type: 2.0'-5.0' 3/8" Bentonite Chips - 5.0'-7.0' 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-2' Type: Concrete WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: N/A
5	345	4.70 - 6.60 Sandy SILTY CLAY, medium plasticity fines, fine sand; grayish blue green (5BG 5/2) to light blue gray (5B 7/1) mottled with moderate yellowish brown (10YR 5/4) and white (N9), cohesive, w-PL, firm	CL		345.3 4.70	1		8.00 10.00		
		6.60 - 6.80 SAND, fine to medium sub-angular sand, non-plastic fines; greenish gray (5G 6/1) to pale olive (10Y 6/2), non-cohesive, moist, loose	SP		343.4 6.80					
		6.80 - 7.40 Sandy SILTY CLAY, medium plasticity fines, fine sand; grayish blue green (5BG 5/2) to light blue gray (5B 7/1) mottled with moderate yellowish brown (10YR 5/4) and white (N9), cohesive, w-PL, firm	CL		342.6 7.40					
10	340	7.40 - 10.50 Silty SAND, fine to coarse well graded sub-angular sand, low plasticity fines, trace fine sub-angular gravels; dark yellowish orange (10YR 6/6) to very pale orange (10YR 8/2), SAPROLITE; non-cohesive, moist, compact	SM		339.5 11.10					
		10.50 - 11.10 SAND, fine to medium sub-angular sand, trace non-plastic fines, trace fine angular gravels; dusky brown (5YR 2/2) to moderate brown (5YR 4/4), highly weathered (W4), quartz, biotite, and weathered micaceous grains, SAPROLITE; non-cohesive, moist, dense	SP		338.9 11.10					
		11.10 - 13.90 SAND, fine angular sand, some non-plastic fines, trace fine angular gravels; dark yellowish orange (10YR 6/6) and grayish orange (10YR 7/4), highly weathered (W4), weathered micaceous grains, quartz, and biotite, SAPROLITE; non-cohesive, wet, very dense	SP-SM		336.1 13.90	2		7.00 7.00		
		13.90 - 15.40 SAND, fine to coarse angular sand, trace non-plastic fines, some fine to coarse soft angular gravel (core stones); moderate yellowish brown (10YR 5/4) mottled white (N9) and pale olive (10YR 6/2), moderately to highly weathered (W3 to W4), weathered micaceous grains, quartz, plagioclase, biotite, SAPROLITE; non-cohesive, wet, very dense	SW		334.6 15.80					
		15.40 - 15.80 TRANSITIONALLY WEATHERED ROCK, fine to coarse angular sand, fine to coarse angular gravels (core stones), trace non-plastic fines; light gray (N7), slightly to moderately weathered (W2-W3), quartz, biotite and weathered micaceous grains, non-cohesive, wet, very dense	TWR		333.2 16.80					
		15.80 - 16.80 Slightly weathered (W2), medium bedded, light olive gray (5Y 5/2) to medium light gray (N7), fine grained, slightly porous, weak rock (R2), GNEISS, some weathering staining, quartz, biotite and weathered micaceous grains.	GNEISS		330 20.00	3		2.80 3.00		
		16.80 - 20.00 Slightly weathered (W2), medium to thin wavy foliated, medium to coarse grained, white (N1) and grayish black (N2) with some dark yellowish orange (10YR 6/6) weathered surfaces, slightly porous (fracture surfaces), medium strong to strong (R3 to R4), BIOTITE GNEISS, with biotite, quartz, hornblende, frequent weathering surfaces								
		17.00: (17.0) fresh (W1), occasional weathered surfaces Boring completed at 20.25 ft								

BOREHOLE RECORD PLANT BRANCH LOGS SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 5.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Trenton Herod

GA INSPECTOR: Jeffrey Ingram
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-32S/BRGWC-32S

SHEET 1 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 45.00 ft
 LOCATION: Milledville, GA

DRILL RIG: TS-150 Track Mounted Rig
 DATE STARTED: 7/19/16
 DATE COMPLETED: 7/20/16

NORTHING: 1,160,677.70
 EASTING: 2,558,497.90
 GS ELEVATION: 403.6
 TOC ELEVATION: 406.39 ft

DEPTH W.L.: 30.05
 ELEVATION W.L.: 322.28
 DATE W.L.: 7/22/2016
 TIME W.L.: 08:00

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		
0		0.00 - 0.70 TOPSOIL, SILTY SAND, fine poorly graded sand, non-plastic fines, some organics (roots); dark yellowish brown (10YR 4/2); non-cohesive, dry, loose	SM		402.9 0.70				WELL CASING Interval: 0.0'-35' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 35'-45' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 32.0'-45.15' Type: 32.0'-33.0' 30/45 Sand - 33.0'-45.15' #1 Sand FILTER PACK SEAL Interval: 27.0'-32.0' Type: 27.0'-30.0' 3/8" Bentonite Chips - 30.0'-32.0' 3/8" Bentonite Pellets ANNULUS SEAL Interval: 3'-27' Type: Portland Cement (Type II) WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: N/A
400		0.70 - 8.30 non-plastic to low plasticity fines, trace organics (roots); moderate reddish brown (10R 4/6), completely weathered (W5), some weathered micaceous grains, SAPROLITE; non-cohesive, moist, loose			395.3 8.30	1	8.80 10.00		
395		8.30 - 17.90 fine to coarse well graded angular sand, non-plastic to low plasticity fines, some fine to coarse soft angular gravels (core stones); pale yellowish brown (10YR 6/2), light brown (5YR 5/6) and black (N1), highly to completely weathered (W4 to W5), some relic foliations in core stones, weathered micaceous grains, quartz, biotite, SAPROLITE; non-cohesive, moist, compact			385.7 17.90 384.5 19.10	2	7.90 10.00	Portland Cement (Type II)	
390									
385		17.90 - 19.10 fine to coarse well graded angular sand, non-plastic to low plasticity fines, some fine to coarse soft angular gravels (core stones); layers of dark yellowish orange (10YR 6/6), pale yellowish brown (10YR 6/2), pale reddish brown (10R 5/4) mottled black (N1) and white (N9), highly weathered (W4), some relic foliations in core stones, weathered micaceous grains, biotite, quartz, SAPROLITE; non-cohesive, moist, compact							
380		19.10 - 28.50 (SP-SM) SAND, fine to coarse sub-angular sand, non-plastic to low plasticity fines, some soft angular gravels (core stones); pale yellowish brown (10YR 6/2), white (N9), and black (N1), highly weathered (W4), some relic foliations in core stones, weathered micaceous grains, biotite, quartz, SAPROLITE; non-cohesive, moist, Dense 25.00: (25.0) some white (N9) fresh quartz pockets	SP-SM			3	10.00 10.00		
375		28.50 - 30.00 SILTY SAND, fine to medium sub-angular poorly graded sand, non-plastic to low plasticity fines; light brown (5YR 5/6) black (N1), and pale yellowish brown (10YR 6/2), highly weathered (W4), some relic foliations, biotite, quartz, weathered micaceous grains, SAPROLITE; non-cohesive, moist, dense	SM		375.1 28.50 373.6 30.00			3/8" Bentonite Chips	
370		30.00 - 32.00 CLAYEY SAND, fine sand, medium plasticity fines; pale yellowish brown (10YR 6/2), to light olive gray (5Y 5/2) mottled black (N1) and white (N9), some relic foliations, weathered micaceous grains, biotite, quartz, SAPROLITE; cohesive, w>PL, hard	SC		371.6 32.00			3/8" Bentonite Pellets	
365		32.00 - 38.70 SAND, fine sand, non-plastic fines; light brown (5YR 5/6), black (N1) and pale yellowish brown (10YR 6/2), highly weathered (W4), weathered micaceous grains, SAPROLITE; non-cohesive, wet, loose	SP-SM			4	10.00 10.00	30/45 Sand #1 Sand	
40		38.70 - 40.00 SAND, fine to coarse sub-angular sand, trace non-plastic fines; pale yellowish brown (10YR 6/2) mottled white (N9) and Black (N1), moderately weathered (W3), some foliation layers, SAPROLITE; non-cohesive, wet, dense	SW		364.9 38.70 363.6 40.00			0.010" Screen Slot	
360		40.00 - 42.50 SANDY SILT, fine sand, low plasticity fines; light olive gray (5Y 5/2), completely weathered rock (W6), weathered micaceous grains, biotite, quartz, SAPROLITE; cohesive, w>PL, firm	ML			5	5.00 5.15		
45		42.50 - 45.00 SAND, fine to medium angular sand, trace non-plastic fines; pale yellowish brown (10YR 6/2), some relic foliations, weathered	SP		361.1 42.50 358.6				

BOREHOLE RECORD PLANT BRANCH LOGS SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 5.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Trenton Herod

GA INSPECTOR: Jeffrey Ingram
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-32S/BRGWC-32S

SHEET 2 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 45.00 ft
 LOCATION: Milledville, GA

DRILL RIG: TS-150 Track Mounted Rig
 DATE STARTED: 7/19/16
 DATE COMPLETED: 7/20/16

NORTHING: 1,160,677.70
 EASTING: 2,558,497.90
 GS ELEVATION: 403.6
 TOC ELEVATION: 406.39 ft

DEPTH W.L.: 30.05
 ELEVATION W.L.: 322.28
 DATE W.L.: 7/22/2016
 TIME W.L.: 08:00

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	REC		
45		micaceous grains, biotite, quartz, SAPROLITE; non-cohesive, wet, dense Boring completed at 45.00 ft							#1 Sand	<p>WELL CASING Interval: 0.0'-35' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 35'-45' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 32.0'-45.15' Type: 32.0'-33.0' 30/45 Sand - 33.0'-45.15' #1 Sand</p> <p>FILTER PACK SEAL Interval: 27.0'-32.0' Type: 27.0'-30.0' 3/8" Bentonite Chips - 30.0'-32.0' 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 3'-27' Type: Portland Cement (Type II)</p> <p>WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: N/A</p>
355										
50										
350										
55										
345										
60										
340										
65										
335										
70										
330										
75										
325										
80										
320										
85										
315										
90										

BOREHOLE RECORD PLANT BRANCH LOGS SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 5.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Trenton Herod

GA INSPECTOR: Jeffrey Ingram
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-47/BRGWC-47

SHEET 1 of 3

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 97.00 ft
 LOCATION: Between Pond B

DRILL RIG: Pro Sonic 150
 DATE STARTED: 1/25/18
 DATE COMPLETED: 1/26/18

NORTHING: 1,162,700.70
 EASTING: 2,559,456.70
 GS ELEVATION: 408.8
 TOC ELEVATION: 411.20 ft

DEPTH W.L.: 25.93
 ELEVATION W.L.: 382.87
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
0		0.00 - 0.50 Ash as sand, fine, dark gray, moist, non-cohesive.	SP	[Graphic Log: Ash as sand]	408.3 0.50			Grout Mix with stainless steel casing	WELL CASING Interval: 0-81.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw WELL SCREEN Interval: 81.6-91.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 91.6-92 FILTER PACK Interval: 80-93 Type: FilterSil FILTER PACK SEAL Interval: 75-80 Type: 3/8" PEL-PLUG Bentonite Pellets ANNULUS SEAL Interval: 0-75 Type: Portland Cement/Quikrete grout mix WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5' DRILLING METHODS Soil Drill: Rotosonic Rock Drill: Core
405		0.50 - 15.00 Residuum, silty Sand, sands f-m, reddish brown, micaceous, moist, non-cohesive.	SM	[Graphic Log: Silty Sand]					
15		15.00 - 75.00 Saprolite, silty Sand, reddish brown to grayish brown with intermediate white mottling, relic structure, micaceous, dry to moist, non	SM	[Graphic Log: Saprolite]	393.8 15.00			Portland Cement/Quikrete grout mix	
395									
15									
390									
20									
385									
25									
380									
30									
375									
35									
370									
40									

Log continued on next page

BOREHOLE RECORD 1666254-01 (1)_SURVEY_UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: David Hannam
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-47/BRGWC-47

SHEET 2 of 3

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 97.00 ft
 LOCATION: Between Pond B

DRILL RIG: Pro Sonic 150
 DATE STARTED: 1/25/18
 DATE COMPLETED: 1/26/18

NORTHING: 1,162,700.70
 EASTING: 2,559,456.70
 GS ELEVATION: 408.8
 TOC ELEVATION: 411.20 ft

DEPTH W.L.: 25.93
 ELEVATION W.L.: 382.87
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
365 45 360 50 355 55 350 60 345 65 340 70 335 75 330 80		15.00 - 75.00 Saprolite, silty Sand, reddish brown to grayish brown with intermediate white mottling, relic structure, micaceous, dry to moist, non (Continued)	SM					3/8" PEL-PLUG Bentonite Pellets FilterSil -	<p>WELL CASING Interval: 0-81.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw</p> <p>WELL SCREEN Interval: 81.6-91.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 91.6-92</p> <p>FILTER PACK Interval: 80-93 Type: FilterSil</p> <p>FILTER PACK SEAL Interval: 75-80 Type: 3/8" PEL-PLUG Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0-75 Type: Portland Cement/Quikrete grout mix</p> <p>WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5'</p> <p>DRILLING METHODS Soil Drill: Rotosonic Rock Drill: Core</p>
		75.00 - 92.00 Partially Weathered Rock, shows in sample as Sand with trace gravel and silt, grayish brown with white mottling, micaceous, relic foliation where preserved, dry, non-cohesive.	SP		333.8 75.00				

Log continued on next page

BOREHOLE RECORD 1666254-01 (1)_SURVEY_UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: David Hannam
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-47/BRGWC-47

SHEET 3 of 3

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 97.00 ft
 LOCATION: Between Pond B

DRILL RIG: Pro Sonic 150
 DATE STARTED: 1/25/18
 DATE COMPLETED: 1/26/18

NORTHING: 1,162,700.70
 EASTING: 2,559,456.70
 GS ELEVATION: 408.8
 TOC ELEVATION: 411.20 ft

DEPTH W.L.: 25.93
 ELEVATION W.L.: 382.87
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
325		75.00 - 92.00 Partially Weathered Rock, shows in sample as Sand with trace gravel and silt, grayish brown with white mottling, micaceous, relic foliation where preserved, dry, non-cohesive. <i>(Continued)</i>	SP	[Graphic Log: Blue triangles]				<p style="font-size: small;">0.010" Slotted Schedule 40 PVC</p> <p style="font-size: small;">3/8" PEL-PLUG Bentonite Pellets</p>	<p>WELL CASING Interval: 0-81.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw</p> <p>WELL SCREEN Interval: 81.6-91.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 91.6-92</p> <p>FILTER PACK Interval: 80-93 Type: FilterSil</p> <p>FILTER PACK SEAL Interval: 75-80 Type: 3/8" PEL-PLUG Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0-75 Type: Portland Cement/Quikrete grout mix</p> <p>WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5'</p> <p>DRILLING METHODS Soil Drill: Rotosonic Rock Drill: Core</p>
90		92.00 - 97.00 BIOTITE GNEISS, sample recovered as rock flour, cobbles, and gravel. Slightly weathered to fresh, white and black, thinly bedded, phaneritic, strong.	GP	[Graphic Log: Red wavy lines]	316.8 92.00				
95		Boring completed at 97.00 ft			311.8				
315									
100									
305									
105									
300									
110									
295									
115									
290									
120									

BOREHOLE RECORD 1666254-01 (1)_SURVEY UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: David Hannam
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18





BORING LOG

BORING PZ-11 S
Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DATE STARTED 2/20/2014 COMPLETED 2/20/2014 GROUND ELEVATION 390.9 ft COORDINATES N 1162467.3 E 2557002.5

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 26 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 9.2 ft. after 250 hrs.

NOTES _____

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\LPARKER\DESKTOP\GFC\PIANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			390.9				Top of casing Elev. = 393.99
5		Lean Clay (CL) residuum damp, stiff, silty CLAY, red with dark gray-brown mottles, sand micas	386.9				
10		saprolite damp, stiff, clayey SILT, yellow-red with black mottles, sand, micas					Annular Seal
15		saprolite very damp, medium stiff, clayey SILT, yellow-brown with black mottles, sand, micas					Filter Pack
20		saprolite wet, soft, SILT, pale yellow with white mottles, sand, micas					
25		saprolite wet, medium stiff, SILT, pale yellow, light gray-brown, white and black mottles, sand, micas					
		saprolite wet, medium stiff, SILT, pale yellow, light gray-brown, white and black mottles, sand, micas	364.9				Screen Tip Elevation

Bottom of borehole at 26.0 feet.



BORING LOG

BORING PZ-12 D

Page 1 of 3

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study

LOCATION Milledgeville, GA

DATE STARTED 4/1/2014 COMPLETED 4/14/2014 GROUND ELEVATION 431.4 ft COORDINATES N 1164311.9 E 2557136.4

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger; Casing Advance; HQ EQUIPMENT CME 550

DRILLED BY T. Milam LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 143.2 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 56 ft. after 200 hrs.

NOTES _____

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCF001\APARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			431.4				Top of casing Elev. = 434.09
5		Lean Clay (CL) dry, silty CLAY, red with pale yellow mottles					
10		damp, silty CLAY, red with red-yellow mottles, sand, trace micas					
		damp, silty CLAY, red with red-yellow mottles, sand, trace micas	419.4				
15		dry, clayey SILT, red-yellow and red with white and pink mottles, some quartz gravel, micas					
20		dry, clayey SILT, pale red and red with yellow-red mottles, then gray-brown and olive-yellow with white mottles, occasional quartz sand, micas					
25		dry, clayey SILT, yellow-brown and pale red with white and black mottles, white felsic seam with quartz sand 23-24 ft., micas					
30		dry, sandy SILT, dry, gray-brown, red and yellow-red with black mottles, micas, white felsic sand seam 28-29 ft.					
35		dry, sandy SILT, pale gray-brown with white mottles, yellow-red with black mottles, micas					
40		dry, sandy SILT, pale gray-brown with white mottles, yellow-red with black mottles, micas					
45		dry, clayey SILT, dry to damp, dark gray to black, red and pale gray-brown with white mottles, sand, micas					

(Continued Next Page)



BORING LOG

BORING PZ-12 D
Page 2 of 3

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			431.4				Top of casing Elev. = 434.09
		(Con't)					(CONTINUED)
50		very damp, sandy SILT, gray-brown and gray with white mottles, sand seams, very wet 44-45 ft.	381.4				
55		Silty Sand (ML) wet, silty SAND, gray-brown with white mottles, mica	376.4				
60		---sampler refusal---					
65		fine to medium grain, soft to medium hard, slightly weathered, flow banded, few fractures, gray and white banding, partially weathered ---auger refusal---					Annular Seal
70		fine to coarse grain, hard, not weathered, flow banded, few fractures, dark gray and white banding, fresh					
75		medium to coarse grain, hard, flow banded, few fractures, dark gray and white banding, fresh					
80		medium to coarse grain, hard, flow banded, few fractures, dark gray and white banding, fresh					Filter Pack
85		medium to coarse grain, hard, flow banded, few fractures, dark gray to black with white banding, fresh					
90		medium to coarse grain, hard, flow banded, few fractures, dark gray to black with white banding, fresh					
95		medium to coarse grain, hard, flow banded, few fractures, dark gray to black with white banding, fresh					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 10/29/20 14:45 - \\ALTRCP01\APARKER\DESKTOP\PIANT BRANCH PIEZOMETERS.GPJ

(Continued Next Page)



BORING LOG

BORING PZ-12 D
Page 3 of 3

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCFP01\APARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
100		(Con't)	431.4				Top of casing Elev. = 434.09 (CONTINUED)
105		medium to coarse grain, hard, flow banded, few fractures, dark gray to black with white banding, fresh					
110		medium to coarse grain, hard, flow banded, few fractures, dark gray to black with white banding, fresh					
115		medium to coarse grain, hard to medium hard, flow banded, few fractures, dark gray to black with white banding, micro-folds, fresh					
120		medium to coarse grain, hard to medium hard, flow banded, few fractures, dark gray to black with white banding, fresh					
125		medium to coarse grain, hard to medium hard, flow banded, few fractures, dark gray to black with white banding, feldspar phenocrysts, fresh					
130		medium to coarse grain, hard to medium hard, flow banded, one fracture, dark gray to black with white banding, fresh					
135		medium to coarse grain, hard to medium hard, flow banded, several fractures, dark gray to black with white banding, fresh					
140		medium to coarse grain, hard to medium hard, flow banded, several fractures, dark gray to black with white banding, fresh	288.2				Screen Tip Elevation

Bottom of borehole at 143.2 feet.



BORING LOG

BORING PZ-18 S
Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DATE STARTED 2/26/2014 COMPLETED 2/26/2014 GROUND ELEVATION 359.7 ft COORDINATES N 1160757.3 E 2557747.4

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 25.1 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 14.8 ft. after 260 hrs.

NOTES _____

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/29/20 14:45 - \\ALTRCF001\APARKER\DESKTOP\PIANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			359.7				Top of casing Elev. = 362.82
5		See PZ-18 I for material descriptions					
10							
15							
20							
25							

Annular Seal

Filter Pack

Screen Tip Elevation

Bottom of borehole at 25.1 feet.



BORING LOG

BORING PZ-18 I
Page 1 of 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Branch Hydrogeologic Study
LOCATION Milledgeville, GA

DATE STARTED 2/24/2014 COMPLETED 2/26/2014 GROUND ELEVATION 359.6 ft COORDINATES N 1160766.2 E 2557745.5

CONTRACTOR SCS Field Services METHOD Hollow Stem Auger; Casing Advance; HQ EQUIPMENT CME 550

DRILLED BY S. Denty LOGGED BY W. Shaughnessy CHECKED BY _____ BORING DEPTH 38.8 ft.

GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 14.7 ft. after 260 hrs.

NOTES _____

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 10/29/20 14:45 - \\ALTRCFP01\APARKER\DESKTOP\GFC\PLANT BRANCH PIEZOMETERS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA
				75	150	225	
			359.6				Top of casing Elev. = 362.55
5		Lean Clay (CL) residuum dry, medium stiff, CLAY, red, micas, silt					
		residuum dry, stiff, Clayey SILT, reds, mica					
			352.6				
10		residuum dry, stiff, Clayey SILT, yellow-red, micas					
15		saprolite very damp, stiff, Clayey SILT, yellow-red, light gray, pale yellow, micas					
20		saprolite wet, stiff, Clayey SILT, brown, white, micas, sand					
25		saprolite wet, hard, Clayey SILT, yellow-brown, dark gray, gray, micas, sand	333.5				Annular Seal
30		Felsic biotite GNEISS medium to coarse grain, medium hard to hard, moderately to not weathered, flow banded, numerous fractures, dark gray, pale yellow, white banding, feldspar, quartz, biotite, pyrite					Filter Pack
35		medium to coarse grain, medium hard to hard, slightly to not weathered, flow banded, few fractures, dark gray, white banding, feldspar, quartz, biotite, pyrite					
			320.8				Screen Tip Elevation

Bottom of borehole at 38.8 feet.

RECORD OF BOREHOLE PZ-231

SHEET 1 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 67.00 ft
 LOCATION: Milledville, GA

DRILL RIG: Mini-Sonic Track Mounted Rig
 DATE STARTED: 7/27/16
 DATE COMPLETED: 7/29/16

NORTHING: 1,162,975.40
 EASTING: 2,557,877.70
 GS ELEVATION: 425.1
 TOC ELEVATION: 427.74 ft

DEPTH W.L.: 52.00
 ELEVATION W.L.: 375.90
 DATE W.L.: 07/29/2016
 TIME W.L.: na

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		
0 - 5	425 - 420	0.00 - 6.00 sandy SILT, fine sand, reddish brown, cohesive, w < PL	ML		419.1 6.00	1		6.00 6.00	<p>WELL CASING Interval: 0'-56.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 56.5'-66.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: PVC</p> <p>FILTER PACK Interval: 54.5'-67' Type: 54.5-55.0 - 30/45 Sand; 55.5-67 - #1 Sand</p> <p>FILTER PACK SEAL Interval: 48.5'-54.5' Type: 52.5'-54.5' - 3/8" Bentonite Pellets, 50.5' -52.5' - 3/8" Bentonite Chips</p> <p>ANNULUS SEAL Interval: 0' - 48.5' Type: Portland Cement (Type II)</p> <p>WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminium</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>
5 - 10	420 - 415	6.00 - 16.00 silty SAND, fine to medium sand, light reddish brown, non-cohesive, moist, micaceous				2		8.00 10.00	
10 - 15	415 - 410	16.00 - 24.00 light grayish brown			409.1 16.00	3		5.40 10.00	
15 - 20	410 - 405		SM						
20 - 25	405 - 400	24.00 - 36.00 silty SAND, fine to coarse, trace gravel, light grayish brown, moist, relict rock structure apparent, SAPROLITE			401.1 24.00				
25 - 30	400 - 395					4		7.50 10.00	
30 - 35	395 - 390								
35 - 37	390 - 389	36.00 - 37.00 No Recovery			389.1 36.00 388.1	5		0.00 1.00	
37 - 40	389 - 385	37.00 - 40.00 Biotite Gneiss, highly competent, little weathering	GNEISS		37.00	6		2.50 3.00	
40 - 42	385 - 384	40.00 - 42.00 Difficult drilling			385.1 40.00				
42 - 45	384 - 381	42.00 - 67.00 Biotite Gneiss			383.1 42.00	7		0.00 6.00	

BOREHOLE RECORD PLANT BRANCH LOGS SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

Log continued on next page

LOG SCALE: 1 in = 5.5 ft
 DRILLING COMPANY: Cascade
 DRILLER: John Vasquez

GA INSPECTOR: Randy Pettyjohn
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



RECORD OF BOREHOLE PZ-23I

SHEET 2 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 67.00 ft
 LOCATION: Milledville, GA

DRILL RIG: Mini-Sonic Track Mounted Rig
 DATE STARTED: 7/27/16
 DATE COMPLETED: 7/29/16

NORTHING: 1,162,975.40
 EASTING: 2,557,877.70
 GS ELEVATION: 425.1
 TOC ELEVATION: 427.74 ft

DEPTH W.L.: 52.00
 ELEVATION W.L.: 375.90
 DATE W.L.: 07/29/2016
 TIME W.L.: na

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	380	42.00 - 67.00 Biotite Gneiss (Continued)			7			<p>3/8" Bentonite Pellets 3/8" Bentonite Chips</p> <p>#1 Sand - 0.010" Slot Size</p>	<p>WELL CASING Interval: 0'-56.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 56.5'-66.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: PVC</p> <p>FILTER PACK Interval: 54.5'-67' Type: 54.5-55.0 - 30/45 Sand; 55.5-67 - #1 Sand</p> <p>FILTER PACK SEAL Interval: 48.5'-54.5' Type: 52.5'-54.5' - 3/8" Bentonite Pellets, 50.5'-52.5' - 3/8" Bentonite Chips</p> <p>ANNULUS SEAL Interval: 0' - 48.5' Type: Portland Cement (Type II)</p> <p>WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminium</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>		
50	375				8		6.00 10.00				
55	370				9		8.60 10.00				
60	365	Boring completed at 67.00 ft			358.1						
65	360										
70	355										
75	350										
80	345										
85	340										
90											

BOREHOLE RECORD PLANT BRANCH LOGS SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 5.5 ft
 DRILLING COMPANY: Cascade
 DRILLER: John Vasquez

GA INSPECTOR: Randy Pettyjohn
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



RECORD OF BOREHOLE PZ-31S

SHEET 1 of 1

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 39.50 ft
 LOCATION: Milledville, GA

DRILL RIG: Prosonic Truck Mounted Rig
 DATE STARTED: 7/15/16
 DATE COMPLETED: 7/26/16

NORTHING: 1,160,936.90
 EASTING: 2,557,971.80
 GS ELEVATION: 374.3
 TOC ELEVATION: 376.77 ft

DEPTH W.L.: 19.6
 ELEVATION W.L.: 357.34
 DATE W.L.: 7/26/16
 TIME W.L.: 10:07

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		
0		0.00 - 5.50 sandy SILT, NP, medium grain, trace fine gravel; reddish brown, massive, micaceous, SAPROLITE; NC, dry loose	MLS						WELL CASING Interval: 0'-29.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 29.5'-39.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 26.5'-39.5' Type: 26.5'-27.5', 30/45 fine sand; 27.5'-39.5', #1 sand FILTER PACK SEAL Interval: 21.5'-26.5' Type: 21.5'-24.5', 3/8" Bentonite Chips; 24.5'-26.5', Bentonite Pellets ANNULUS SEAL Interval: 2.0'-21.5' Type: Portland Cement (Type I) WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
370		5.50 - 5.80 SAND, poorly graded, fine grain; light yellowish brown; NC, dry, loose	SP MLS		5.80 367.3				
		5.80 - 7.00 sandy SILT, NP, medium grain, trace fine gravel; reddish brown, massive, micaceous, SAPROLITE; NC, dry, loose			7.00				
		7.00 - 9.50 fine sand, trace coarse subangular sand; brown, homogenous, micaceous, SAPROLITE; NC, dry, compact			364.8 9.50				
		9.50 - 17.00 SAND, well graded, medium grain, trace subrounded coarse sand, trace silt; grey brown with white mottle, massive, micaceous, SAPROLITE; NC, dry (moist at 16 ft), compact	SW			2	10.00 10.00		
365					357.3				
360					17.00				
		17.00 - 19.50 clayey SAND, medium grain, poorly graded, highly plastic clay, trace subangular coarse sand; yellowish brown sand, grey clay, moderately weathered, heterogenous, micaceous; NC, moist, slightly loose	SC		354.8 19.50				
		19.50 - 23.00 poorly graded, medium grain sand, low plastic clay; grey with brown mottling, homogenous, micaceous, SAPROLITE; cohesive, wet, firm	SC		351.3 23.00	3	10.00 10.00		
		23.00 - 25.00 highly plastic clay, trace subangular coarse sand; yellowish brown sand, grey clay, moderately weathered, heterogenous, micaceous, SAPROLITE; NC, moist, slightly loose	SC		349.3 25.00				
		25.00 - 27.00 well graded, medium-coarse grained sand, few clay, trace subangular fine gravel, trace cobbles; dark grey clay, light brown sand with white mottling, heterogenous, micaceous, SAPROLITE; NC, moist, loose	SC		347.3 27.00				
		27.00 - 29.50 CLAYEY SAND, poorly graded, medium grained sand, low plastic clay; grey with brown mottling, homogenous, micaceous, SAPROLITE; cohesive, wet, firm	SPG		344.8 29.50				
		29.50 - 31.50 gravelly SAND, medium-coarse sand, well graded, some angular cobbles; grey-white mottling, highly weathered bedrock, micaceous; NC, wet, very loose	TWR		342.8 31.50 341.3 33.00	4	10.00 10.00		
		31.50 - 33.00 TRANSITIONALLY WEATHERED ROCK, biotite GNEISS, highly weathered, yellow, white brown, medium-coarsely crystalline, soft rock, feldspar, quartz, biotite, pulverized rock, moist, highly fractured			337.3				
		33.00 - 37.00 No Recovery			336.5				
		37.00 - 37.80 sluff in hole			38.00		1.00 2.50		
		37.80 - 38.00 TRANSITIONALLY WEATHERED ROCK, biotite GNEISS, highly weathered, yellow, white brown, medium-coarsely crystalline, soft rock, feldspar, quartz, biotite, pulverized rock, wet, highly fractured			334.8				
		38.00 - 39.50 No Recovery							
		Boring completed at 39.50 ft							

BOREHOLE RECORD PLANT BRANCH LOGS2 SURVEY UPDATED.GPJ PIEDMONT.GDT 8/20/20

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: John Vasquez

GA INSPECTOR: Will Ethier
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 9/15/16



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-39

SHEET 1 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 56.50 ft
 LOCATION: Milledgville, GA

DRILL RIG: TS-150 Track Mounted Rig
 DATE STARTED: 7/30/16
 DATE COMPLETED: 7/30/16

NORTHING: 1,163,675.40
 EASTING: 2,557,460.50
 GS ELEVATION: 432.0
 TOC ELEVATION: 434.78 ft

DEPTH W.L.: 46.02
 ELEVATION W.L.: 388.68
 DATE W.L.: 08/02/2016
 TIME W.L.: 14:15

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	430	0.00 - 10.00 SILT, NP; reddish brown, moderately weathered, massive, micaceous, SAPROLITE; cohesive, dry, firm	ML		422 10.00	1		10.00 10.00		<p>WELL CASING Interval: 0'-34.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 34.7'-44.7' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 31.4'-44.7' Type: 31.4'-32.5', 30/45 fine sand; 32.5'-44.7', #1 sand</p> <p>FILTER PACK SEAL Interval: 26.2'-31.4' Type: 26.2'-29.4', 3/8" Bentonite Chips; 29.4'-31.4', Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 2'-26.2' Type: Portland Cement (Type I)</p> <p>WELL COMPLETION Pad: 4'x4' Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: N/A</p>
5	425	10.00 - 15.00 No Recovery			417 15.00	2		5.00 10.00		
10	420	15.00 - 19.50 SILT, NP, trace fine sand; reddish brown, moderately weathered, massive, micaceous, SAPROLITE; cohesive, dry, firm	ML		412.5					
15	415	19.50 - 20.00 trace fine-coarse sand; white mottling, relict rock structure, micaceous, SAPROLITE; cohesive, dry, soft			410 22.00					
20	410	20.00 - 22.00 No Recovery			410 22.00					
25	405	22.00 - 30.00 SILT, NP, trace fine-coarse sand; reddish brown with white mottling, moderately weathered, relict rock structure, micaceous, SAPROLITE; cohesive, moist, soft	ML		402 30.00	3		8.00 10.00		
30	400	30.00 - 33.00 No Recovery			399 33.00 398 34.00	4		7.00 10.00		
35	395	33.00 - 34.00 SILT, NP, trace fine-coarse sand; reddish brown with white mottling, moderately weathered, relict rock structure, micaceous, SAPROLITE; cohesive, moist, soft	ML		392 40.00					
40	390	34.00 - 40.00 light grey brown			386.8 45.20 385.8 46.20	5		6.50 6.50		
45	385	40.00 - 45.20 sandy SILT, NP, fine-medium grain sand, trace coarse sand; reddish light grey brown mottled, moderately weathered, relict foliation structure, micaceous, SAPROLITE; cohesive, wet, very soft	MLS							
50		45.20 - 46.20 silty SAND, well graded fine-coarse sand, angular, NP, trace subangular cobbles, weathered bedrock, quartz, mica; grey brown, lightly weathered, relict foliation structures, micaceous, SAPROLITE, cohesive, wet, very soft	SM							
		46.20 - 56.50 Fresh, foliated, dark grey, white, red, finely-medium crystalline, highly competent rock, biotite GNEISS, little fractured	GNEISS			6		3.50 3.50		

BOREHOLE RECORD PLANT BRANCH LOGS2_SURVEY UPDATED.GPJ_PIEDMONT.GDT_9/29/20

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Trenton Herod

GA INSPECTOR: Will Ethier
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/15/17



Log continued on next page

Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-39

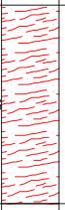
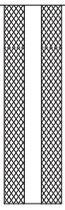
SHEET 2 of 2

PROJECT: SCS Plant Branch
 PROJECT NUMBER: 166-0939
 DRILLED DEPTH: 56.50 ft
 LOCATION: Milledgville, GA

DRILL RIG: TS-150 Track Mounted Rig
 DATE STARTED: 7/30/16
 DATE COMPLETED: 7/30/16

NORTHING: 1,163,675.40
 EASTING: 2,557,460.50
 GS ELEVATION: 432.0
 TOC ELEVATION: 434.78 ft

DEPTH W.L.: 46.02
 ELEVATION W.L.: 388.68
 DATE W.L.: 08/02/2016
 TIME W.L.: 14:15

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		46.20 - 56.50 Fresh, foliated, dark grey, white, red, finely-medium crystalline, highly competent rock, biotite GNEISS, little fractured (<i>Continued</i>)	GNEISS						WELL CASING Interval: 0'-34.7' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 34.7'-44.7' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 31.4'-44.7' Type: 31.4'-32.5', 30/45 fine sand; 32.5'-44.7', #1 sand FILTER PACK SEAL Interval: 26.2'-31.4' Type: 26.2'-29.4', 3/8" Bentonite Chips; 29.4'-31.4', Bentonite Pellets ANNULUS SEAL Interval: 2'-26.2' Type: Portland Cement (Type I) WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: N/A	
380										
55		Boring completed at 56.50 ft								
375					375.5					
60										
370										
65										
365										
70										
360										
75										
355										
80										
350										
85										
345										
90										
340										
95										
335										
100										

BOREHOLE RECORD PLANT BRANCH LOGS2_SURVEY_UPDATED.GPJ | PIEDMONT.GDT | 9/29/20

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Trenton Herod

GA INSPECTOR: Will Ethier
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/15/17



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-46

SHEET 1 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 47.00 ft
 LOCATION: Former Coal Pile

DRILL RIG: Pro Sonic 150
 DATE STARTED: 2/5/18
 DATE COMPLETED: 2/5/18

NORTHING: 1,162,756.20
 EASTING: 2,560,559.00
 GS ELEVATION: 382.1
 TOC ELEVATION: 384.64 ft

DEPTH W.L.: 8.85
 ELEVATION W.L.: 373.25
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
0		0.00 - 8.00 Soil was removed by Hydrovac from 0-8 ft bgs.							<p>WELL CASING Interval: 0-35.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw</p> <p>WELL SCREEN Interval: 35.6-45.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 45.6-47</p> <p>FILTER PACK Interval: 34-46 Type: FilterSil</p> <p>FILTER PACK SEAL Interval: 29-34 Type: 3/8" PEL-PLUG Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0-29 Type: Portland Cement/Quikrete grout mix</p> <p>WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5'</p> <p>DRILLING METHODS Soil Drill: Rotasonic Rock Drill: Core</p>
380									
5									
375									
10		8.00 - 37.00 Residuum, silty Sand, sands f-c, dark brown, micaceous, non-cohesive, moist, loose.		SM	374.1 8.00				
370									
15									
365									
20							Portland cement/quikrete grout mix		
360									
25									
355									
30									
350							3/8" PEL-PLUG Bentonite Pellets		
35							FilterSil		
345		37.00 - 39.00 Saprolite, BIOTITE GNEISS, core presented as rock flour, and gravel/cobbles, black and white with light green coating around rock, highly mafic, thinly laminated, fine grained, soft.		GP-GM	345.1 37.00				
40		39.00 - 47.00 BIOTITE GNEISS, slightly weathered to fresh, thickly banded, white and black, phaneritic, very strong.			343.1 39.00		0.010" Slotted Schedule 40 PVC		

Log continued on next page

BOREHOLE RECORD 1666254-01 (1)_SURVEY_UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: Ben Hodges
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-46

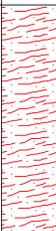
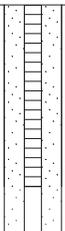
SHEET 2 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 47.00 ft
 LOCATION: Former Coal Pile

DRILL RIG: Pro Sonic 150
 DATE STARTED: 2/5/18
 DATE COMPLETED: 2/5/18

NORTHING: 1,162,756.20
 EASTING: 2,560,559.00
 GS ELEVATION: 382.1
 TOC ELEVATION: 384.64 ft

DEPTH W.L.: 8.85
 ELEVATION W.L.: 373.25
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
340		39.00 - 47.00 BIOTITE GNEISS, slightly weathered to fresh, thickly banded, white and black, phaneritic, very strong. <i>(Continued)</i>							WELL CASING Interval: 0-35.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw WELL SCREEN Interval: 35.6-45.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 45.6-47
335		Boring completed at 47.00 ft			335.1				FILTER PACK Interval: 34-46 Type: FilterSil FILTER PACK SEAL Interval: 29-34 Type: 3/8" PEL-PLUG Bentonite Pellets ANNULUS SEAL Interval: 0-29 Type: Portland Cement/Quikrete grout mix WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5' DRILLING METHODS Soil Drill: Rotasonic Rock Drill: Core
330									
325									
320									
315									
310									
305									
300									
295									
290									
285									
280									
275									
270									
265									
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125									
120									
115									
110									
105									
100									
95									
90									
85									
80									

BOREHOLE RECORD 1666254-01 (1)_SURVEY UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: Ben Hodges
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-48

SHEET 1 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 67.00 ft
 LOCATION: South of Skills Center

DRILL RIG: Pro Sonic 150
 DATE STARTED: 1/24/18
 DATE COMPLETED: 1/25/18

NORTHING: 1,163,046.70
 EASTING: 2,558,444.60
 GS ELEVATION: 418.3
 TOC ELEVATION: 420.90 ft

DEPTH W.L.: 30.55
 ELEVATION W.L.: 387.75
 DATE W.L.: 2/14/18
 TIME W.L.:

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		
0		0.00 - 8.00 Soil removed by Hydrovac from 0-8 ft bgs.						Grout mix with stainless steel casing	WELL CASING Interval: 0-56.6 Material: Schedule 40 PVC Diameter: 2" Joint Type: Screw WELL SCREEN Interval: 56.6-66.6 Material: 0.010" Slotted Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: 66.6-67 FILTER PACK Interval: 55-67 Type: FilterSil FILTER PACK SEAL Interval: 50-55 Type: 3/8" PEL-PLUG Bentonite Pellets ANNULUS SEAL Interval: 0-50 Type: Portland Cement/Quikrete grout mix WELL COMPLETION Pad: 4'x4' Protective Casing: 4"x4"x5' DRILLING METHODS Soil Drill: Rotasonic Rock Drill: Core
415									
5									
410		8.00 - 17.00 Fill, silty Sand, reddish brown, micaceous, moist, non-cohesive.			410.3 8.00				
10									
405			SM						
15									
400		17.00 - 64.50 Residuum, Sand with some silt, grayish brown with white mottling, occasional relic structure, micaceous, dry, non-cohesive.			401.3 17.00				
20									
395									
25								Portland Cement/Quikrete grout mix	
390									
30			SM						
385									
35									
380									
40									

Log continued on next page

BOREHOLE RECORD 1666254-01 (1)_SURVEY UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: David Hannam
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-48

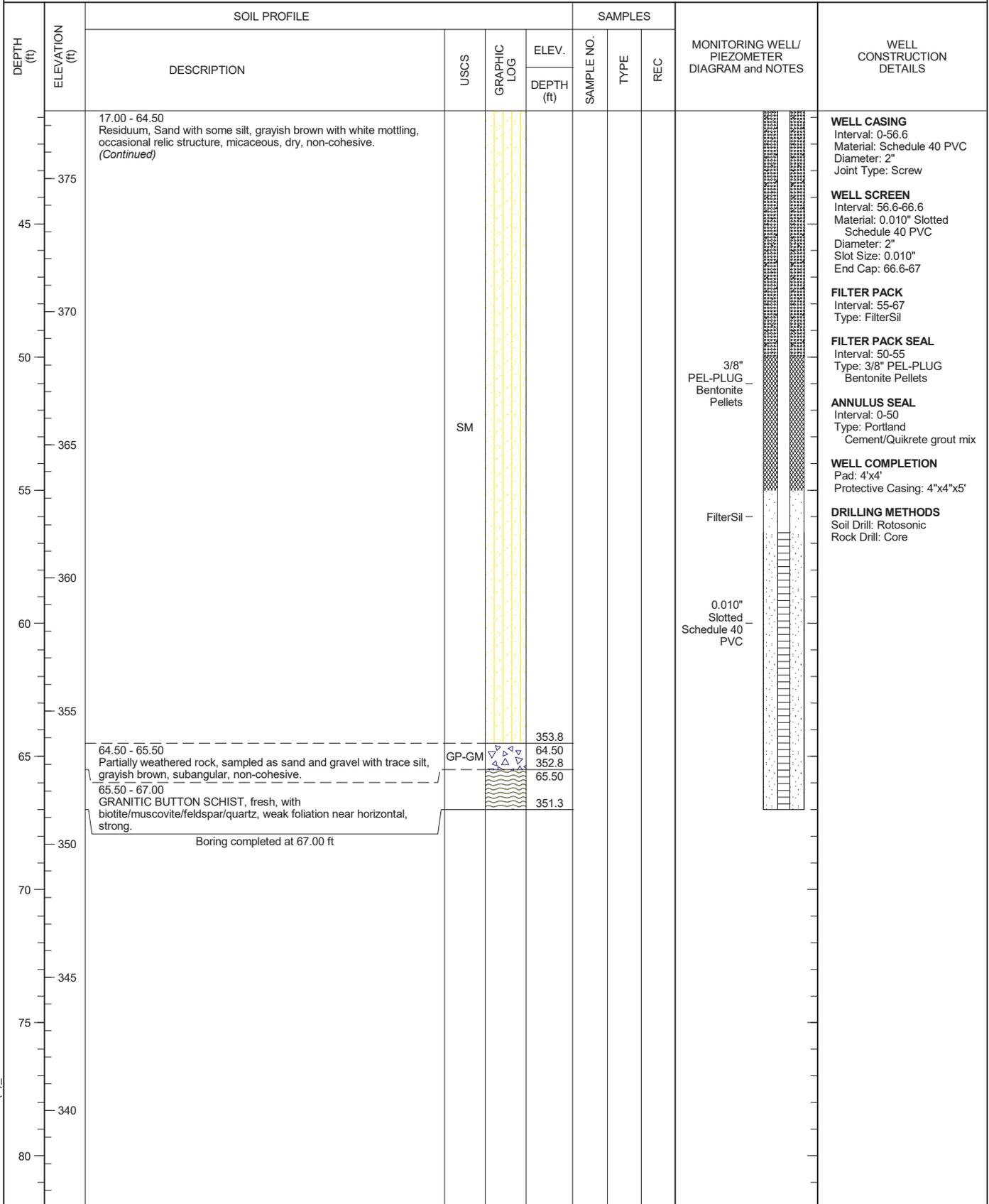
SHEET 2 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 67.00 ft
 LOCATION: South of Skills Center

DRILL RIG: Pro Sonic 150
 DATE STARTED: 1/24/18
 DATE COMPLETED: 1/25/18

NORTHING: 1,163,046.70
 EASTING: 2,558,444.60
 GS ELEVATION: 418.3
 TOC ELEVATION: 420.90 ft

DEPTH W.L.: 30.55
 ELEVATION W.L.: 387.75
 DATE W.L.: 2/14/18
 TIME W.L.:



BOREHOLE RECORD 1666254-01 (1)_SURVEY UPDATED.GPJ PIEDMONT.GDT 8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade
 DRILLER: Matt Pope

GA INSPECTOR: David Hannam
 CHECKED BY: Rachel P. Kirkman, P.G.
 DATE: 5/31/18



RECORD OF BOREHOLE PZ-54

SHEET 1 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 52.00 ft
 LOCATION: SE of Pond E

DRILL RIG: C 600 Track Mounted
 DATE STARTED: 5/15/20
 DATE COMPLETED: 5/15/20

NORTHING: 1,164,828.70
 EASTING: 2,555,458.30
 GS ELEVATION: 440.8
 TOC ELEVATION: 443.86 ft

DEPTH W.L.: 41.4'
 ELEVATION W.L.: 399.4
 DATE W.L.: 5/16/2020
 TIME W.L.: 735

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	440	0.00 - 7.00 CL, silty sandy CLAY, medium to coarse sand, angular quartz, red, mottled texture, trace fine gravel, subrounded to subangular, deeply weathered, plagioclase, firm to stiff, dry to moist, RESIDUUM	CL		433.8	1	ROTO SONIC	<u>3.00</u> 7.00	AquaGuard Bentonite - Grout	WELL CASING Interval: 0' - 42' Material: Sch 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 42' - 52' Material: 0.010" Slotted Schedule 40 PVC Pre-Pack Screen Diameter: 2" Slot Size: 0.010" End Cap: 3" FILTER PACK Interval: 40' - 52' Type: #1 Sand FILTER PACK SEAL Interval: 36.5' - 40' Type: Pel-Plug 3/8" ANNULUS SEAL Interval: 0' - 36.5' Type: AquaGuard Bentonite Grout WELL COMPLETION Pad: 4' x 4' x 2" Protective Casing: Aluminum DRILLING METHODS Soil Drill: Sonic Rock Drill: N/A
5	435	7.00 - 13.00 CL, silty CLAY some sand, fine to medium sand, angular to subangular, yellowish red, no structure, quartz and plagioclase, RESIDUUM	CL		427.8	2	ROTO SONIC	<u>10.00</u> 10.00		
10	430	13.00 - 17.00 SM, silty SAND, fine to medium sand, angular to subangular, light red to red, weak foliation, weathered to very weathered feldspathic biotite gneiss with sodium-plagioclase to potassium feldspar, quartz, little to trace mica, cohesive, non-plastic, firm to moist, dry, RESIDUUM	SM		423.8					
15	425	17.00 - 19.00 ML, clayey sandy SILT, red, mica rich, deeply weathered, feldspathic biotite gneiss, cohesive, slightly plastic, moist, RESIDUUM	ML		421.8					
20	420	19.00 - 28.00 SM, silty SAND, fine to medium sand, light red to red, weak foliation, weathered to very weathered feldspathic biotite gneiss, moist, cohesive, non-plastic to slightly plastic, firm, SAPROLITE	SM		412.8	3	ROTO SONIC	<u>10.00</u> 10.00		
25	415	28.00 - 37.00 SM, silty SAND, fine to medium sand, light brown to light reddish brown, weathered to very weathered, feldspathic biotite gneiss, foliated to weakly foliated, non plastic, firm, oxidation at 28', SAPROLITE	SM		403.8	4	ROTO SONIC	<u>9.50</u> 10.00		
30	410	37.00 - 48.00 SM, clayey silty SAND, fine sand, pale brown, weathered feldspathic biotite gneiss, quartz-biotite-plagioclase, trace to little oxidation/mottling throughout, foliated to weakly foliated, moist, cohesive, non-plastic, stiff, SAPROLITE	SM		37.00	5	ROTO SONIC	<u>10.00</u> 10.00	Bentonite -	
35	405									
40	400									

BOREHOLE RECORD PLANT_BRANCH 20200603 SURVEY UPDATED-ATL1-L-BSTEELE.GPJ | PIEDMONT.GDT: 8/21/20

Log continued on next page

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Fred Kraus

GA INSPECTOR: Shannon George
 CHECKED BY: Brian Steele, PG
 DATE: 6/23/20



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-54

SHEET 2 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 52.00 ft
 LOCATION: SE of Pond E

DRILL RIG: C 600 Track Mounted
 DATE STARTED: 5/15/20
 DATE COMPLETED: 5/15/20

NORTHING: 1,164,828.70
 EASTING: 2,555,458.30
 GS ELEVATION: 440.8
 TOC ELEVATION: 443.86 ft

DEPTH W.L.: 41.4'
 ELEVATION W.L.: 399.4
 DATE W.L.: 5/16/2020
 TIME W.L.: 735

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
40	400	37.00 - 48.00 SM, clayey silty SAND, fine sand, pale brown, weathered feldspathic biotite gneiss, quartz-biotite-plagioclase, trace to little oxidation/mottling throughout, foliated to weakly foliated, moist, cohesive, non-plastic, stiff, SAPROLITE <i>(Continued)</i>	SM		392.8	5	ROTO SONIC	10.00 10.00		<p>WELL CASING Interval: 0' - 42' Material: Sch 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 42' - 52' Material: 0.010" Slotted Schedule 40 PVC Pre-Pack Screen Diameter: 2" Slot Size: 0.010" End Cap: 3"</p> <p>FILTER PACK Interval: 40' - 52' Type: #1 Sand</p> <p>FILTER PACK SEAL Interval: 36.5' - 40' Type: Pel-Plug 3/8"</p> <p>ANNULUS SEAL Interval: 0' - 36.5' Type: AquaGuard Bentonite Grout</p> <p>WELL COMPLETION Pad: 4' x 4' x 2" Protective Casing: Aluminum</p> <p>DRILLING METHODS Soil Drill: Sonic Rock Drill: N/A</p>
45	395	48.00 - 52.00 TWR, weathered feldspathic biotite gneiss interlayered with unweathered feldspathic biotite gneiss, coarse grained, foliated to weakly foliated, some oxidation staining	TWR		48.00	6	ROTO SONIC	5.00 5.00		
		Boring completed at 52.00 ft			388.8					
50	390									
55	385									
60	380									
65	375									
70	370									
75	365									
80										

BOREHOLE RECORD PLANT_BRANCH_20200603_SURVEY_UPDATED-ATL1-L-BSTEELE.GPJ_PIEDMONT.GDT_8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Fred Kraus

GA INSPECTOR: Shannon George
 CHECKED BY: Brian Steele, PG
 DATE: 6/23/20



Location resurveyed June - July 2020

RECORD OF BOREHOLE PZ-55

SHEET 2 of 2

PROJECT: Plant Branch
 PROJECT NUMBER: 1666254-01
 DRILLED DEPTH: 49.30 ft
 LOCATION: SE of Pond E

DRILL RIG: TSI Compact Crawler
 DATE STARTED: 5/19/20
 DATE COMPLETED: 5/19/20

NORTHING: 1,163,208.00
 EASTING: 2,554,783.60
 GS ELEVATION: 450.2
 TOC ELEVATION: 453.07 ft

DEPTH W.L.: 45.3'
 ELEVATION W.L.: 404.9
 DATE W.L.: 5/20/2020
 TIME W.L.: 740

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			
40	410	39.50 - 41.00 SP-SM, poorly graded Sand with Silt, very fine to fine sand, little fine gravel, moist to wet, grayish brown, loose to compact, non-plastic <i>(Continued)</i>	SP-SM	[Graphic Log]	409.2	5	ROTO SONIC	10.30 10.30	#1 Sand		<p>WELL CASING Interval: 0' - 39.3' Material: Sch 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 39.3' - 49.3' Material: 0.010" Slotted Schedule 40 PVC Pre-Pack Screen Diameter: 2" Slot Size: 0.010" End Cap: 3"</p> <p>FILTER PACK Interval: 36.4' - 49.3' Type: #1 Sand</p> <p>FILTER PACK SEAL Interval: 34' - 36.4' Type: Pel-Plug 3/8"</p> <p>ANNULUS SEAL Interval: 0' - 34' Type: AquaGuard Bentonite Grout</p> <p>WELL COMPLETION Pad: 4' x 4' x 2" Protective Casing: Aluminum</p> <p>DRILLING METHODS Soil Drill: Sonic Rock Drill: Sonic</p>
		41.00 - 42.00 ML, sandy SILT, very fine to fine sand, pale brown, moist, firm, non-plastic, moderate foliation, SAPROLITE	ML	[Graphic Log]	41.00 408.2 42.00						
		42.00 - 46.00 SP, SAND, fine sand, brown, poorly graded, moist to wet, loose to compact, non-plastic, SAPROLITE	SP	[Graphic Log]	404.2 46.00						
45	405	46.00 - 48.50 ML, sandy SILT, fine sand, weathered gneiss, feldspathic biotite gneiss, moderate foliation, cohesive, firm to stiff, non-plastic, moist to wet, SAPROLITE	ML	[Graphic Log]	401.7 401.2						
		48.50 - 49.00 TWR, transitionally weathered rock, weathered biotite gneiss, medium grained	TWR	[Graphic Log]							
		49.00 - 49.30 BR, Biotite Gneiss, medium grained, moderate foliation, hornblende-quartz-biotite-plagioclase Boring completed at 49.30 ft	BR	[Graphic Log]							
50	400							0.010" Slotte Screen			
55	395										
60	390										
65	385										
70	380										
75	375										
80											

BOREHOLE RECORD PLANT_BRANCH_20200603_SURVEY_UPDATED-ATL1-L-BSTEELE.GPJ_PIEDMONT.GDT_8/21/20

LOG SCALE: 1 in = 5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Fred Kraus

GA INSPECTOR: Shannon George
 CHECKED BY: Brian Steele, PG
 DATE: 6/24/20



 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-1S/PB-1 Page: 1 of 5
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Drilling Start Date: 01/18/2019 Drilling End Date: 01/22/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 96 Boring Diameter (in): 6.50 Static Water Level (ft): 24.54/NA DTW After Drilling (ft): 24.4/NA Top of Casing Elev. (ft) 403.16/NA Ground Elev. (ft): 400.4/NA Location (X,Y): 1164910.5, 2556355.9	Well Depth (ft): 38/NA Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Chips/Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
0				SS	0.58	1	2	(0') Clayey SAND (SC); moist, reddish-brown, organic material.	PB-1 (0-2)	400
1				SS	1.66	1	7	(2') Sandy lean CLAY (CL); medium plasticity, medium stiff, dry, reddish-brown, micaceous, some quartz gravel in lenses.	PB-1 (2-4)	
3				SS	2	3	13		PB-1 (4-6)	
5				SS	2	3	8	(6') Clayey SAND (SC); mostly medium grained sand, few coarse gravel, few clay, medium dense, dry, light reddish-brown, some coarse quartz sand lenses.	PB-1 (6-8)	395
7				SS	1.84	2	7	(8') SILT (ML); mostly silt, nonplastic, medium stiff, dry, yellowish-brown, small iron oxide concretions throughout (10 mm).	PB-1 (8-10)	
9				SS	1.84	3	9	(10') SILT (ML); mostly silt, nonplastic, medium stiff, dry, yellowish-brown, small iron oxide concretions throughout (10 mm), more fine sand and mica.	PB-1 (10-12)	390
11				SS	2	3	9	(12') Silty SAND (SM); medium dense, dry, pale reddish-brown, weak relict structure, micaceous, some gravel quartz lenses.	PB-1 (12-14)	
13				SS	2	4	8		PB-1 (14-16)	
15				SS	1.66	3	12	(16') Silty SAND (SM); dense, moist, pale reddish-brown, relict rock structure more evident, micaceous, some gravel quartz lenses.	PB-1 (16-18)	385
17				SS	2	4	10		PB-1 (18-20)	
19						4				
20						4				

NOTES: PB-1S is a stickup well located ~10ft away from PB-1 borehole.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-1S/PB-1 Page: 2 of 5
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Drilling Start Date: 01/18/2019 Drilling End Date: 01/22/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 96 Boring Diameter (in): 6.50 Static Water Level (ft): 24.54/NA DTW After Drilling (ft): 24.4/NA Top of Casing Elev. (ft) 403.16/NA Ground Elev. (ft): 400.4/NA Location (X,Y): 1164910.5, 2556355.9	Well Depth (ft): 38/NA Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Chips/Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
20			SH	2					PB-1 (20-22)	380
22			SS	2	4	13		(22') Silty SAND (SM); dense, moist, pale reddish-brown, micaceous with relict rock fabric.	PB-1 (22-24)	
24			SS	2	5	19		(24') Silty SAND (SM); dense, wet, pale reddish-brown, micaceous with relict rock fabric, weathered quartz lens at 25.5 ft.	PB-1 (24-26)	
26			SS	2	6	31			PB-1 (26-28)	375
28			SS	1.34	17	86		(28') Silty SAND (SM); dense, wet, pale reddish-brown, material becoming harder, more rock like, highly weathered Gneiss. (28') Top of PWR.	PB-1 (28-30)	
30			SS	1.26	11	87			PB-1 (30-32)	370
32								(32') Switched to 5ft-center for SPT (SS) sampling due to PWR.		
35			SS	1.58	16	77		(35') Weathered Gneiss, abundant quartz, mica with biotite.	PB-1 (35-37)	365
40										

NOTES: PB-1S is a stickup well located ~10ft away from PB-1 borehole.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-1S/PB-1 Page: 3 of 5
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Drilling Start Date: 01/18/2019 Drilling End Date: 01/22/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 96 Boring Diameter (in): 6.50 Static Water Level (ft): 24.54/NA DTW After Drilling (ft): 24.4/NA Top of Casing Elev. (ft) 403.16/NA Ground Elev. (ft): 400.4/NA Location (X,Y): 1164910.5, 2556355.9	Well Depth (ft): 38/NA Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Chips/Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)				
40	[Yellow dotted pattern]		[Dark grey triangle pattern]	SS	0	19 39 50/5	89		PB-1 (40-42)	360	
45				SS	0.92	15 45 50/4	95		(45') Silty SAND (SM); very dense, wet, mottled, weathered Gneiss with quartz, biotite, and feldspar.	PB-1 (45-47)	355
50				SS	0.34	31 50/5	50			PB-1 (50-52)	350
55				SS	0.5	50/5			(55') No bag sample collected.		345
60											

NOTES: PB-1S is a stickup well located ~10ft away from PB-1 borehole.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-1S/PB-1 Page: 4 of 5
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Drilling Start Date: 01/18/2019 Drilling End Date: 01/22/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 96 Boring Diameter (in): 6.50 Static Water Level (ft): 24.54/NA DTW After Drilling (ft): 24.4/NA Top of Casing Elev. (ft): 403.16/NA Ground Elev. (ft): 400.4/NA Location (X,Y): 1164910.5, 2556355.9	Well Depth (ft): 38/NA Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Chips/Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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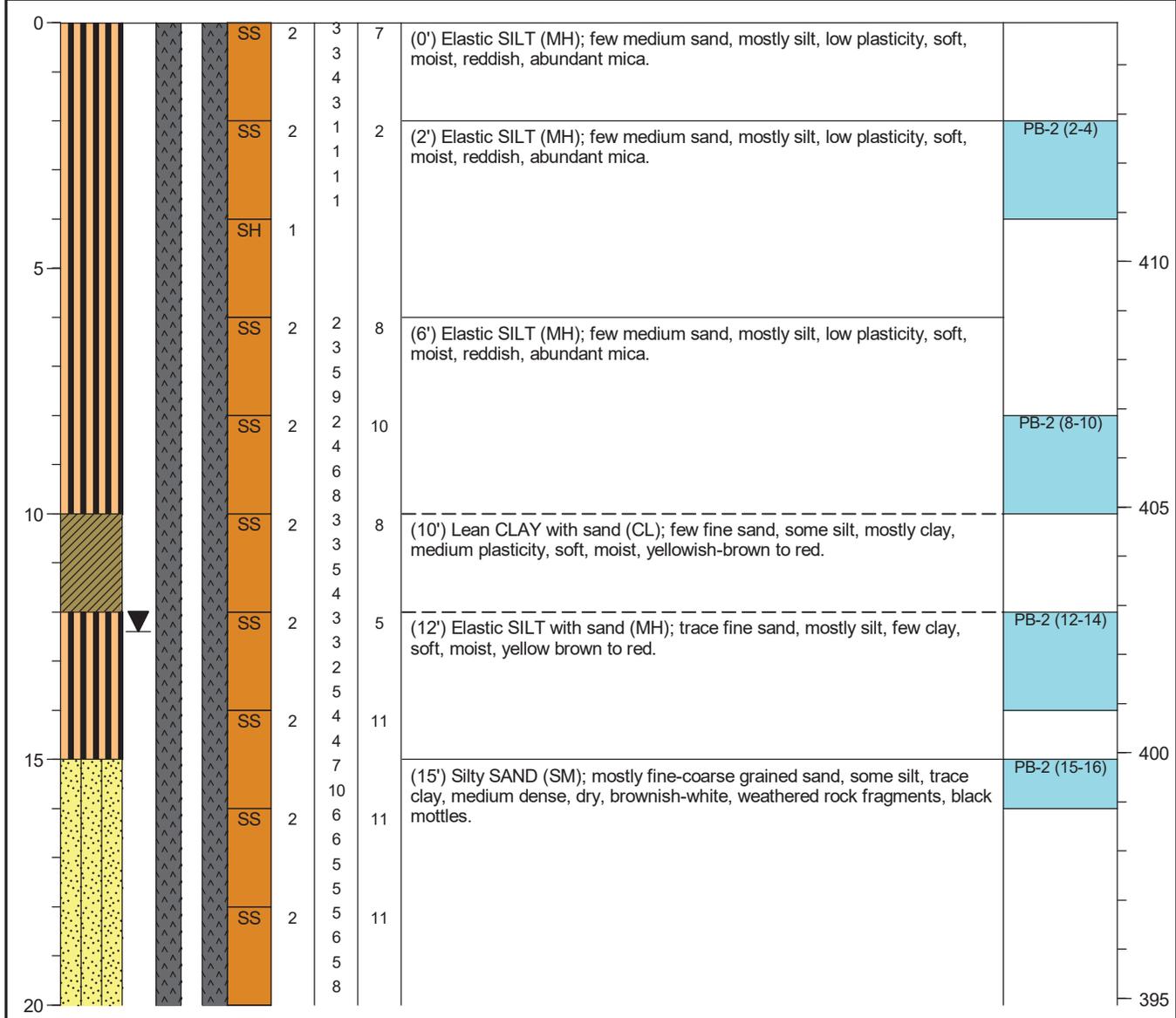
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
60				SS	0.16	44 50/4	50	(60') No bag sample collected.		340
65				SS	5.5	50/2		(65') Silty SAND (SM); very dense, wet, some coarse quartz sand, weathered Gneiss with relict banding, quartz, feldspar, and biotite. PWR becomes more competent. Very slow drilling, effective auger refusal at 67ft. (67') Began mud rotary drilling.		335
70								(72') No bag sample collected.		330
75									325	
80							(79') Very hard drilling.			

NOTES: PB-1S is a stickup well located ~10ft away from PB-1 borehole.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-2D Page: 1 of 4
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Drilling Start Date: 11/29/2018 Drilling End Date: 12/04/2018 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 61 Boring Diameter (in): 6.50 Static Water Level (ft): 39.50 DTW After Drilling (ft): 12.40 Top of Casing Elev. (ft): 416.71 Ground Elev. (ft): 414.9 Location (X,Y): 1164853.6, 2556914.2	Well Depth (ft): 57 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			



NOTES: PB-2D is a stickup well.
NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-2D Page: 2 of 4
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Drilling Start Date: 11/29/2018 Drilling End Date: 12/04/2018 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 61 Boring Diameter (in): 6.50 Static Water Level (ft): 39.50 DTW After Drilling (ft): 12.40 Top of Casing Elev. (ft): 416.71 Ground Elev. (ft): 414.9 Location (X,Y): 1164853.6, 2556914.2	Well Depth (ft): 57 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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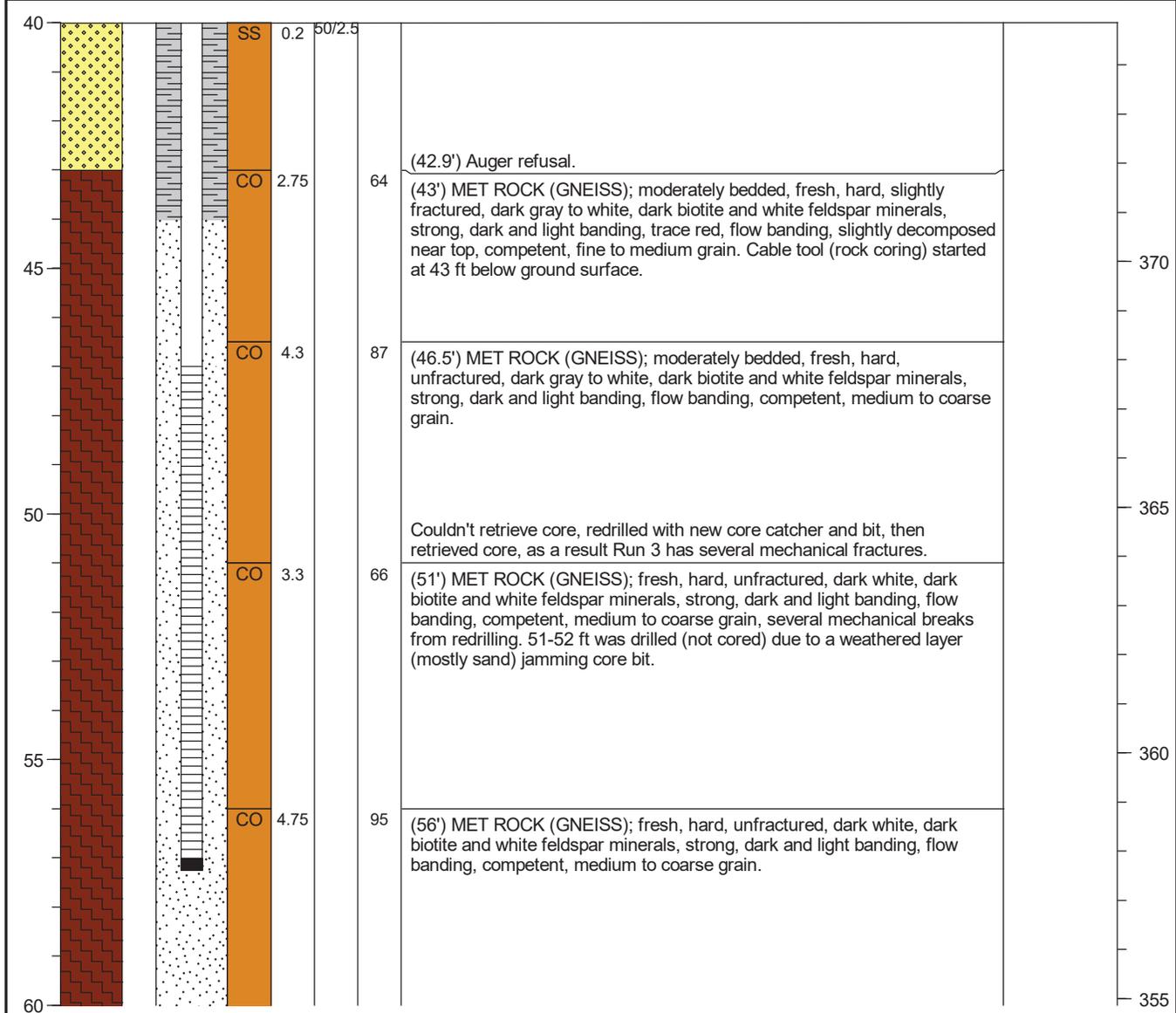
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)
20				SS	2	7	8			
				SS	2	5	11	(21.5') SILT (ML); trace fine sand, mostly silt, few clay, nonplastic, soft, dry, reddish-brown, abundant mica.		
				SS	2	5	13	(22') SILT with sand (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, dry, brownish-white, black mottles, abundant mica.		
				SS	2	5	10	(24') SILT with sand (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, dry, brownish-white to light gray, abundant mica.	PB-2 (24-26)	390
				SS	2	5	16	(26') SILT with sand (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, soft, dry, white to yellow brown.		
				SS	1.5	6	21	(28') SILT with sand (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, dry, brownish-white.		
				SS	1.5	7	47	(30') SILT (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, moist, yellow brown to brownish-white, black mottles, abundant laminated mica.	PB-2 (30-32)	385
				SS	2	9	28	(32') SILT (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, hard, moist, brown to yellow brown to white, black mottles, mica, laminated, weathered white quartz rock fragments.		
				SS	2	8	38	(34') SILT (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, moist, gray to white.		
				SS	2	13	50	(36') SILT with sand (ML); few fine-coarse sand, mostly silt, trace clay, nonplastic, stiff, moist, yellowish-brown to white, abundant mica, quartz, laminated.	PB-2 (36-38)	
				SS	1	30	50/5.5	(38') Well-graded SAND (SW); mostly fine-coarse grained sand, few silt, trace clay, very dense, moist, brown to dark gray, black mottles, quartz.	PB-2 (38-40)	
40								(39') Top of PWR.		375

NOTES: PB-2D is a stickup well.
NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-2D Page: 3 of 4
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Drilling Start Date: 11/29/2018 Drilling End Date: 12/04/2018 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 61 Boring Diameter (in): 6.50 Static Water Level (ft): 39.50 DTW After Drilling (ft): 12.40 Top of Casing Elev. (ft): 416.71 Ground Elev. (ft): 414.9 Location (X,Y): 1164853.6, 2556914.2	Well Depth (ft): 57 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

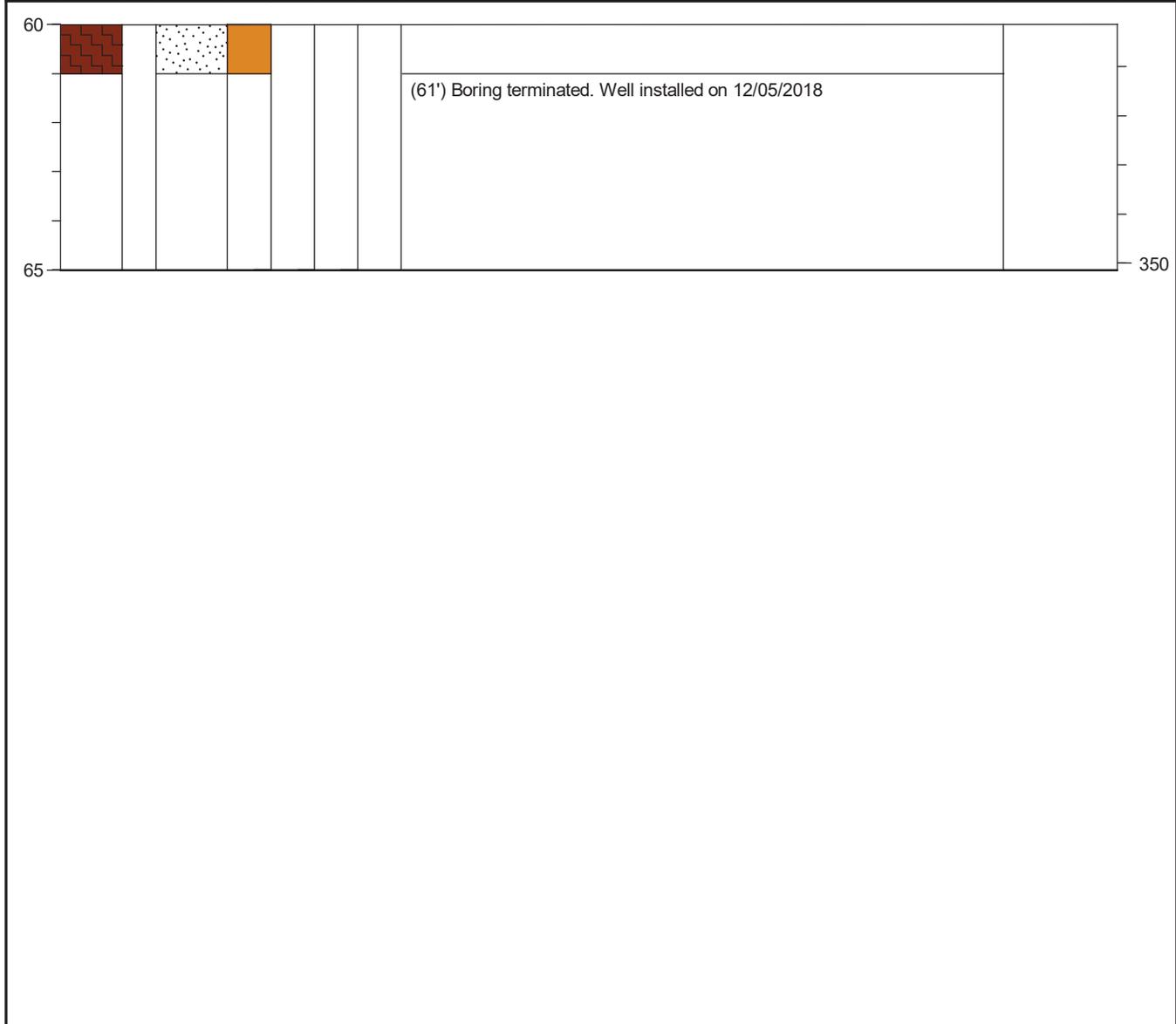


NOTES: PB-2D is a stickup well.
NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-2D Page: 4 of 4
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Drilling Start Date: 11/29/2018 Drilling End Date: 12/04/2018 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 61 Boring Diameter (in): 6.50 Static Water Level (ft): 39.50 DTW After Drilling (ft): 12.40 Top of Casing Elev. (ft): 416.71 Ground Elev. (ft): 414.9 Location (X,Y): 1164853.6, 2556914.2	Well Depth (ft): 57 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)



NOTES: PB-2D is a stickup well.
 NA = Not Applicable

Easting and Northing in NAD 83.
 Elevation in NAVD 88.

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 1 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) Ground Elev. (ft): 409.3(PB-4S) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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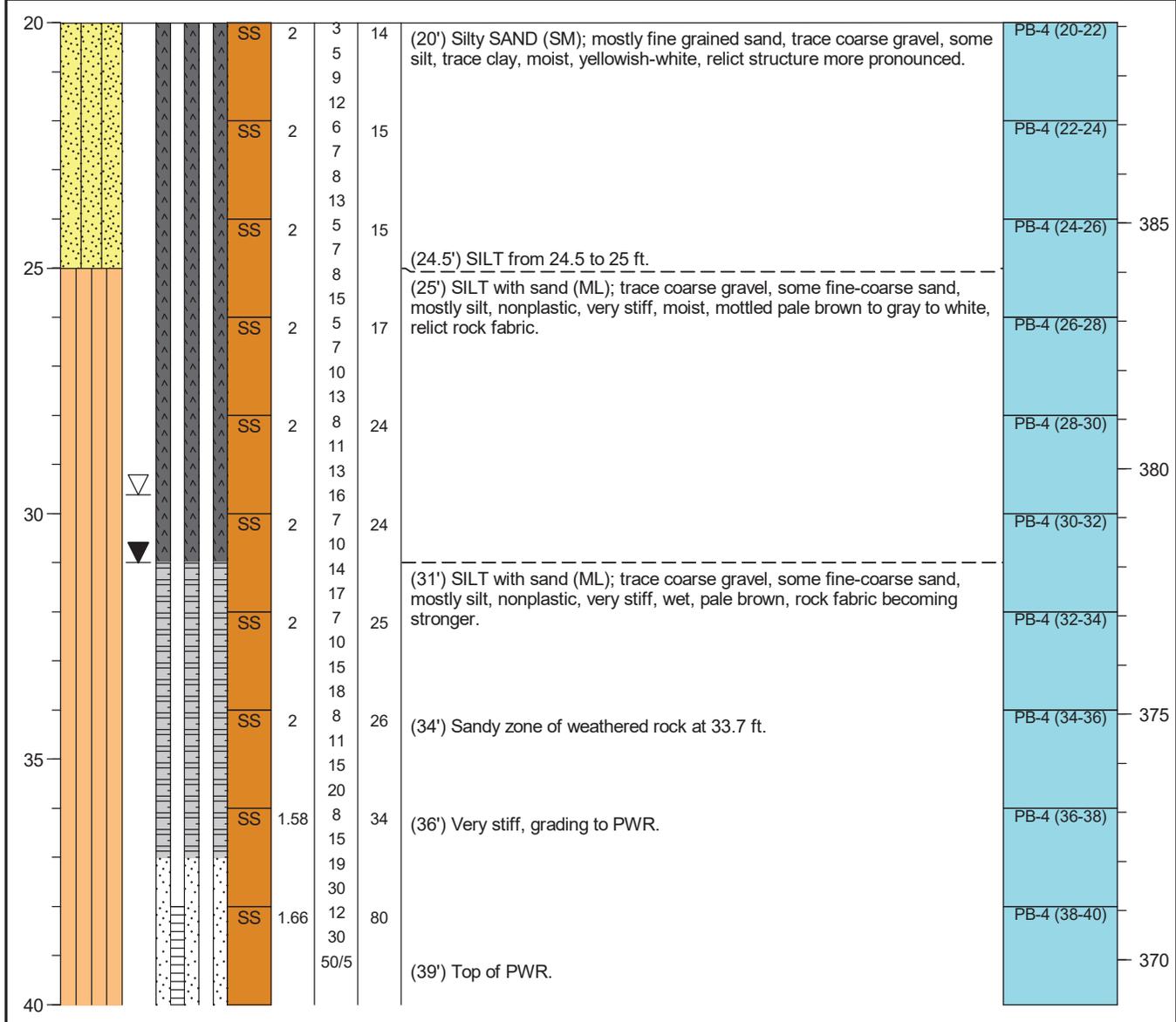
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
0				SS	1.34	1	4	(0') Clayey SAND (SC); some fine-coarse grained sand, some silt, little clay, moist, reddish.	PB-4 (0-2)	
				SS	1.76	1	14	(2') Lean CLAY (CL); trace fine sand, mostly clay, medium plasticity, stiff, moist, dark reddish, micaceous with trace quartz fragments.	PB-4 (2-4)	
				SS	1.76	3	13		PB-4 (4-6)	405
5				SS	1.66	5	11	(6') Elastic SILT (MH); little fine sand, mostly silt, trace clay, low plasticity, stiff, moist, dark reddish, more micaceous.	PB-4 (6-8)	
				SS	1.5	2	8		PB-4 (8-10)	400
10				SS	1.76	3	9		PB-4 (10-12)	
				SS	2	2	8	(11') Silty SAND (SM); mostly fine grained sand, trace coarse gravel, some silt, trace clay, dense, dry, mottled red to pink brown, trace quartz gravel.	PB-4 (12-14)	
				SS	1.58	3	9	(12') Silty SAND (SM); mostly fine grained sand, trace coarse gravel, some silt, trace clay, moist, yellowish-white, 1 inch thick clay lens 14.6 to 14.7.		395
15								Attempted Shelby Tube, only 10 in recovery, discarded.		
				SH	1.92					390
20										

NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 2 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) Ground Elev. (ft): 409.3(PB-4S) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			

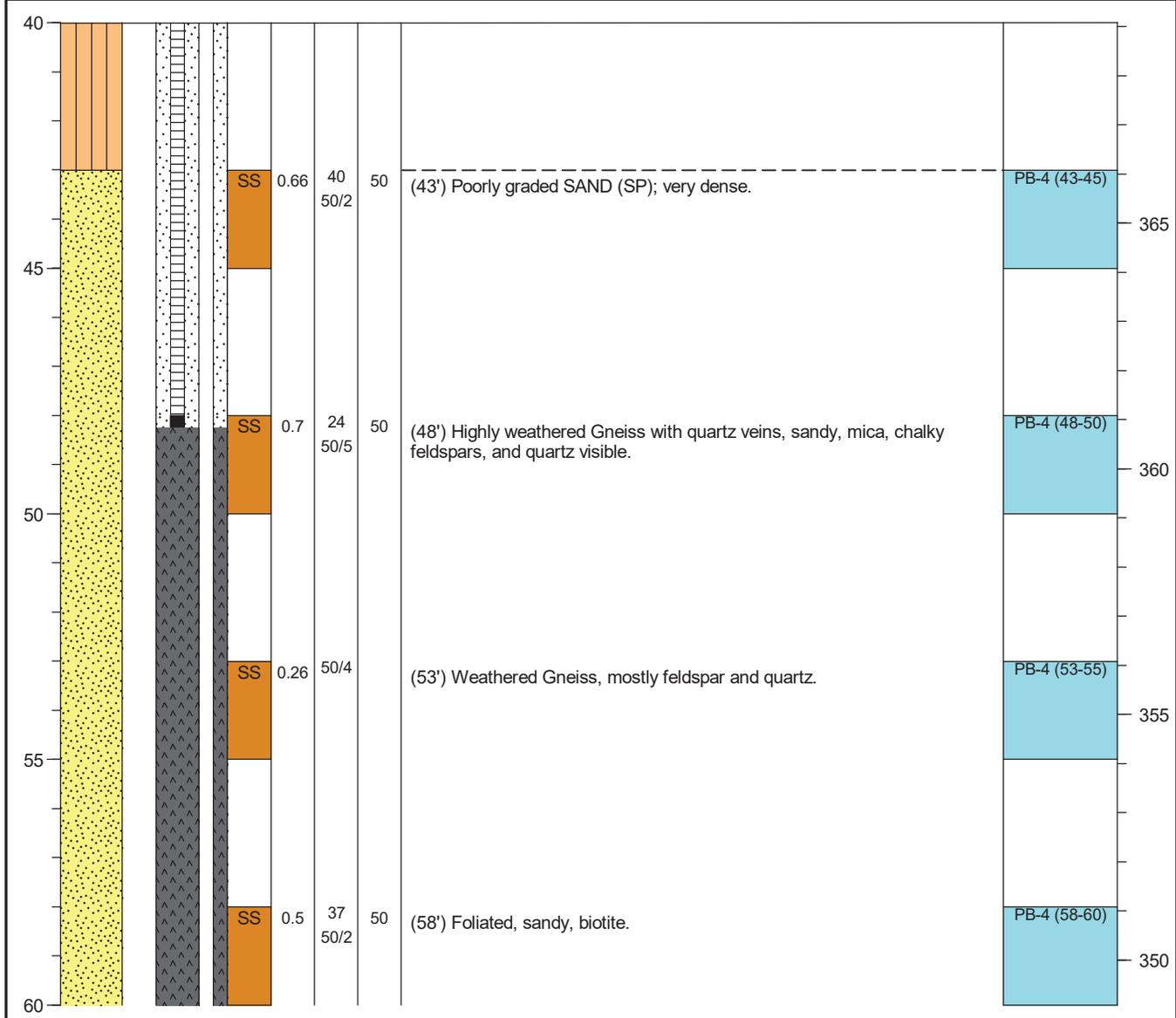


NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 3 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) 412.12(PB-4D) Ground Elev. (ft): 409.3(PB-4S) 409.0(PB-4D) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

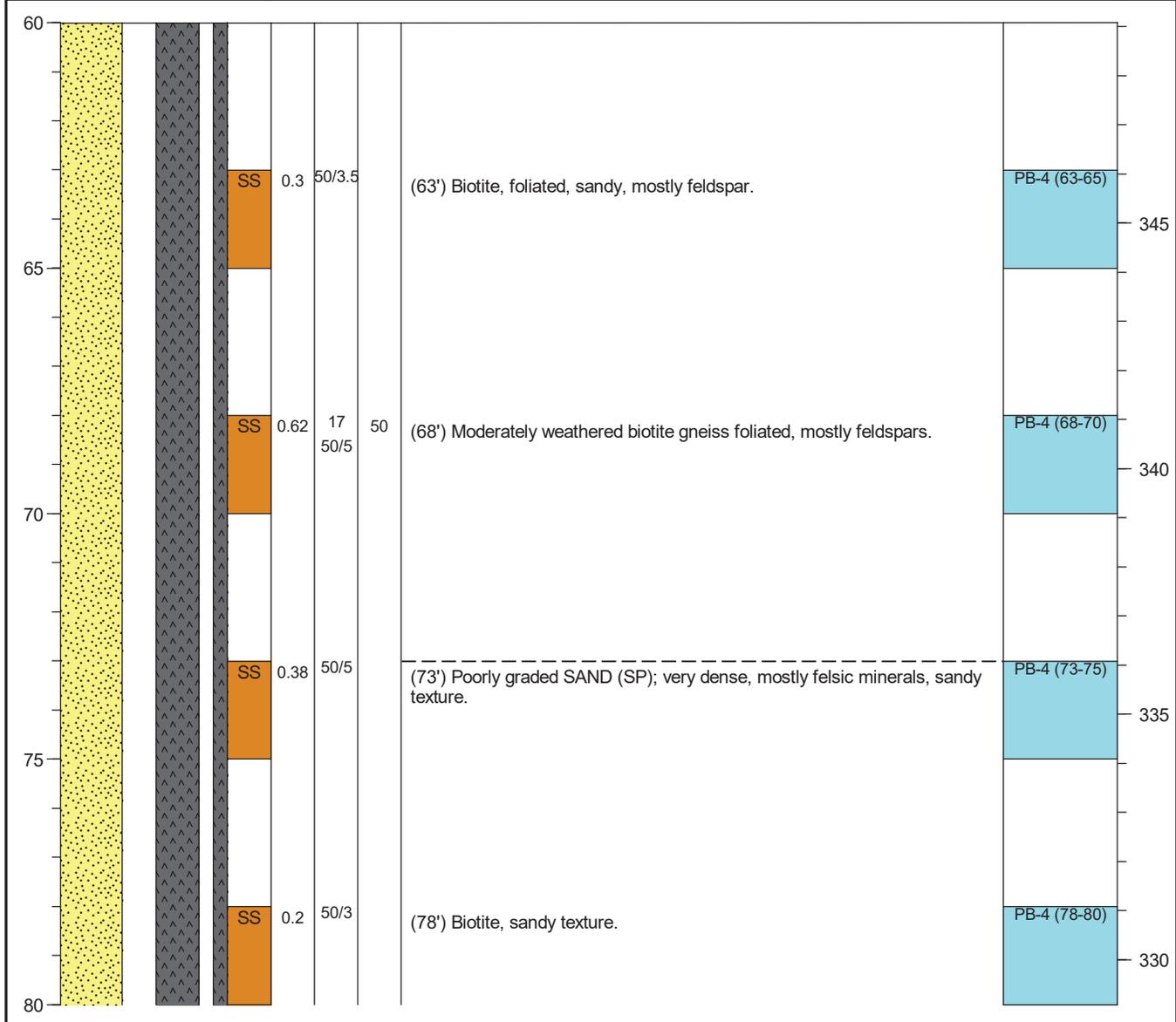


NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 4 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) Ground Elev. (ft): 409.3(PB-4S) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

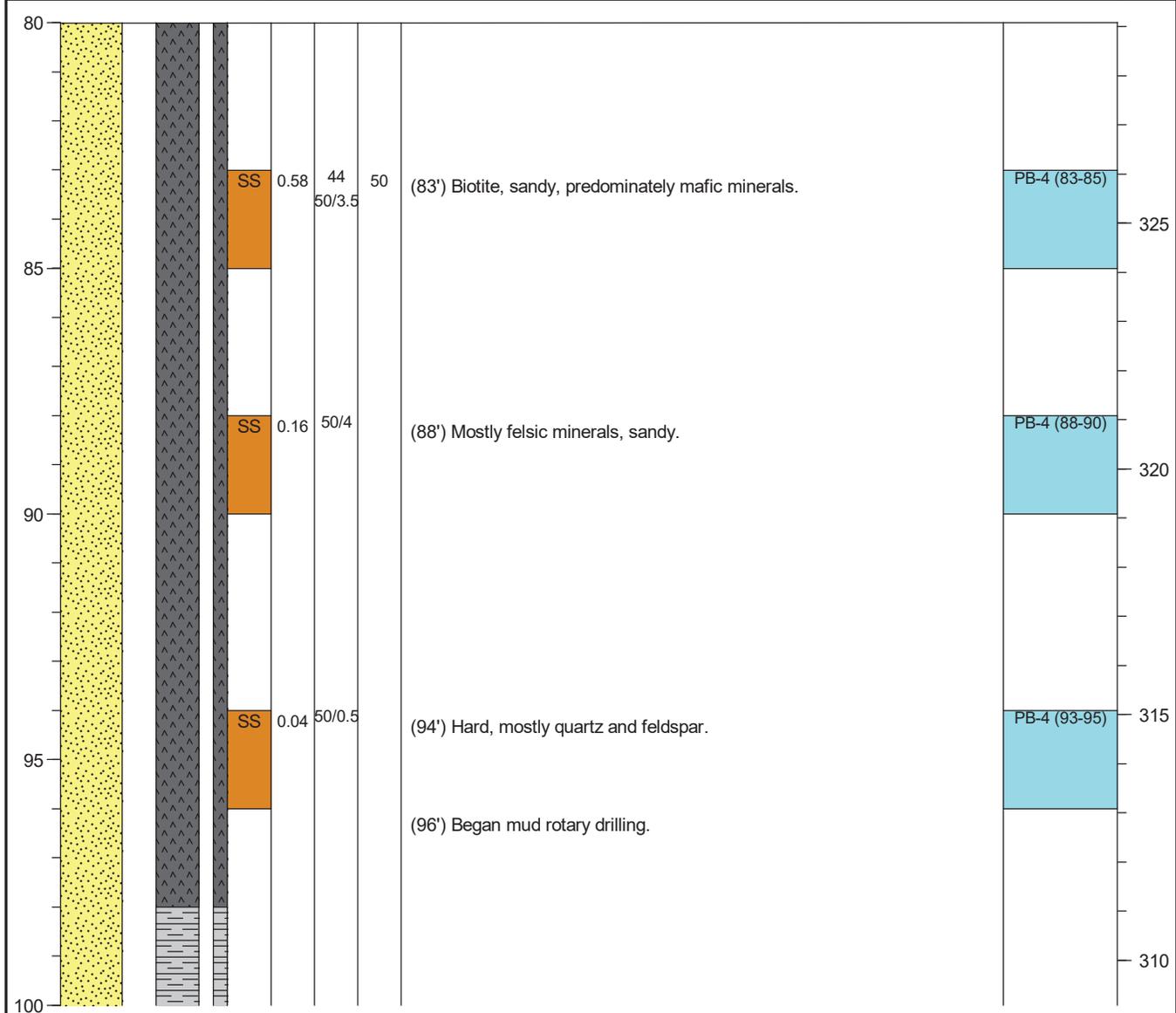


NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 5 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) 412.12(PB-4D) Ground Elev. (ft): 409.3(PB-4S) 409.0(PB-4D) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

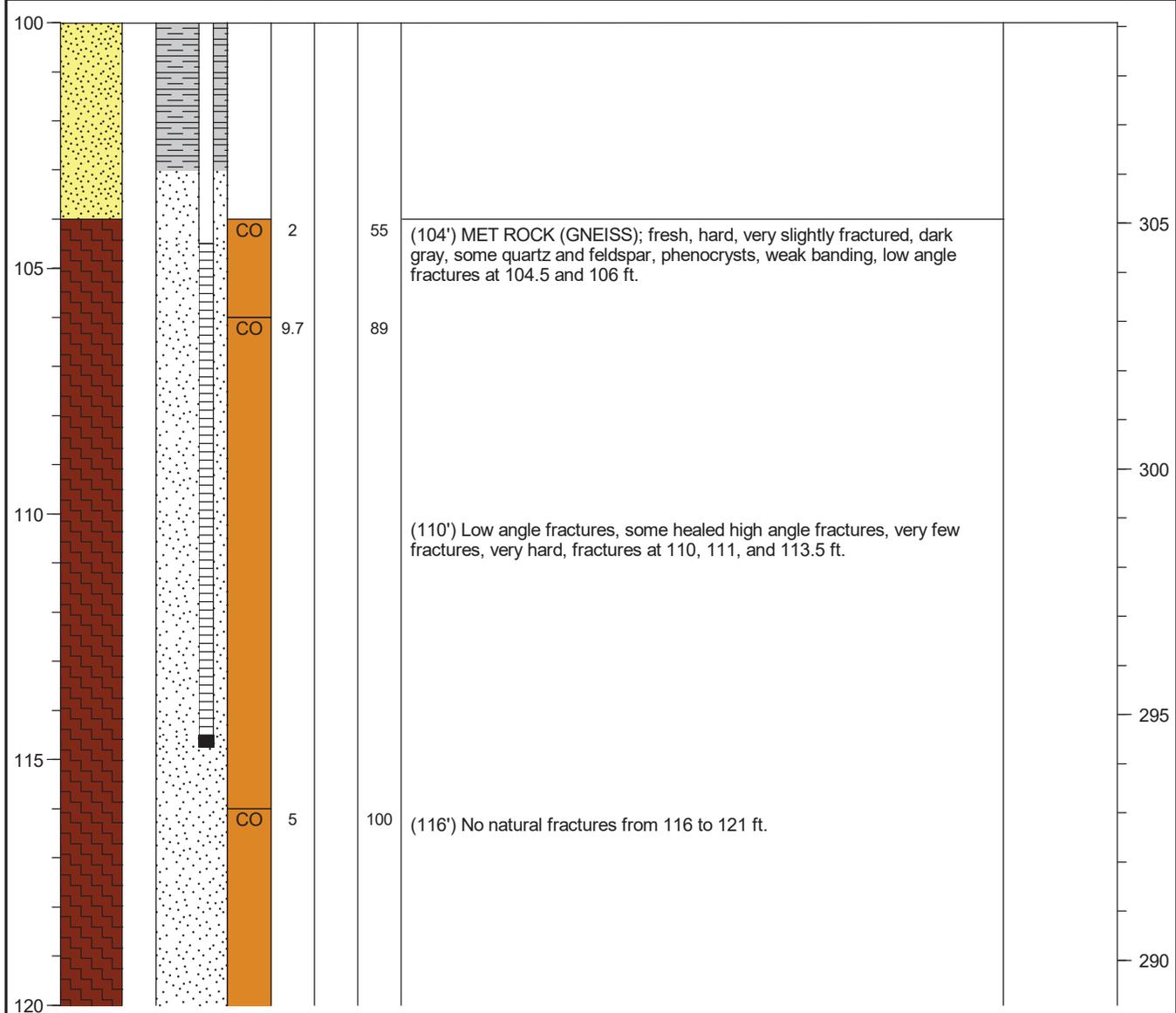


NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 6 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) 409.3(PB-4S) 412.12(PB-4D) Ground Elev. (ft): 409.0(PB-4D) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

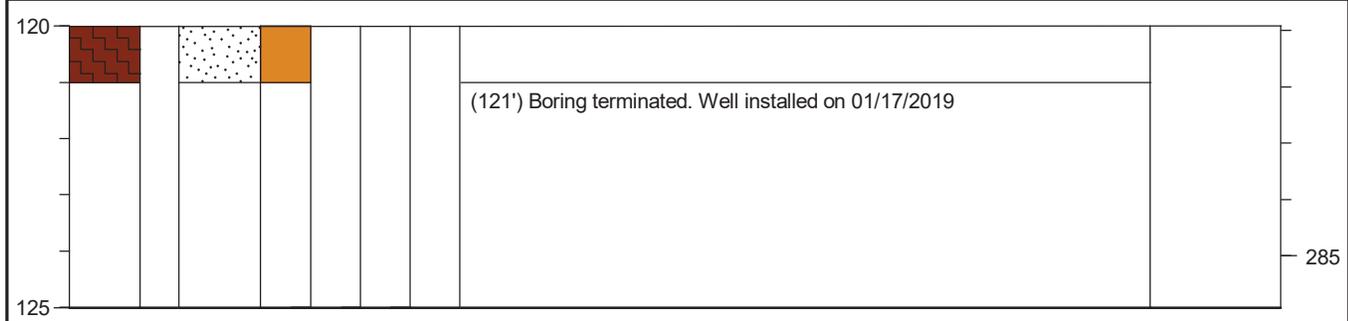


NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-4S/PB-4D Page: 7 of 7
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Drilling Start Date: 01/14/2019 Drilling End Date: 01/16/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: CME-550 Driller: Stan White Logged By: Joseph Ivanowski	Boring Depth (ft): 121 Boring Diameter (in): 6.50 Static Water Level (ft): 31.54/29.62 DTW After Drilling (ft): 31.70/31.00 Top of Casing Elev. (ft): 411.15(PB-4S) 409.3(PB-4S) 412.12(PB-4D) Ground Elev. (ft): 409.0(PB-4D) Location (X,Y): 1164335.1, 2556069.2(PB-4S) 1164339.6, 2556060.7(PB-4D)	Well Depth (ft): 48/114.5 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)



NOTES: PB-4S and PB-4D are stickup wells, PB-4S is ~10ft away from PB-4D well.
 NA = Not Applicable

Easting and Northing in NAD 83.
 Elevation in NAVD 88.

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-7S/PB-7 Page: 1 of 3
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Drilling Start Date: 01/10/2019 Drilling End Date: 01/14/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 59.6 Boring Diameter (in): 6.50 Static Water Level (ft): 24.51/NA DTW After Drilling (ft): 24.60/NA Top of Casing Elev. (ft) 402.88/NA Ground Elev. (ft): 399.7/NA Location (X,Y): 1163831.3, 2556186.2	Well Depth (ft): 33 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			

0				SS	1.5	1	4	(0') Lean CLAY (CL); few fine-coarse sand, few silt, mostly clay, medium plasticity, very soft, moist, reddish, few roots and organic matter.	PB-7 (0-2)	
				SS	2	3	11	(2') Lean CLAY (CL); few fine-coarse sand, few silt, mostly clay, medium plasticity, stiff, moist, reddish, trace mica.	PB-7 (2-4)	
				SS	2	3	7	(4') Lean CLAY (CL); few fine-coarse sand, few silt, mostly clay, medium plasticity, soft, moist, reddish, abundant mica.	PB-7 (4-6)	395
5				SS	2	3	7	(6') Lean CLAY (CL); few fine-coarse sand, few silt, medium plasticity, soft, moist, yellowish-red, abundant mica.	PB-7 (6-8)	
				SS	2	2	5	(8') Lean CLAY (CL); few fine-medium sand, some silt, mostly clay, medium plasticity, soft, moist, yellow to yellowish-brown, black mottles, abundant mica.	PB-7 (8-10)	390
10				SH	1.76	4		(12') CEC		
				SS	1.5	2	6	(12') SILT (ML); some fine-coarse sand, mostly silt, trace clay, soft, moist, yellowish-brown, black mottles, abundant mica.	PB-7 (12-14)	
15				SS	1.6	3	10	(14') SILT (ML); some fine-coarse sand, mostly silt, trace clay, soft, moist, yellowish-brown, black mottles, abundant mica.	PB-7 (14-16)	385
				SS	2	3	11	(16') SILT (ML); some fine-coarse sand, mostly silt, trace clay, soft, moist, yellowish-brown, black mottles, abundant mica, more sand.	PB-7 (16-18)	
20				SS	1.5	4	8	(18') SILT (ML); some fine-coarse sand, mostly silt, trace clay, soft, moist, yellowish-brown, black mottles, abundant mica.	PB-7 (18-20)	380

NOTES: PB-7S is a stickup well located ~10ft away from PB-7 borehole.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-7S/PB-7 Page: 2 of 3
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Drilling Start Date: 01/10/2019 Drilling End Date: 01/14/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 59.6 Boring Diameter (in): 6.50 Static Water Level (ft): 24.51/NA DTW After Drilling (ft): 24.60/NA Top of Casing Elev. (ft) 402.88/NA Ground Elev. (ft): 399.7/NA Location (X,Y): 1163831.3, 2556186.2	Well Depth (ft): 33 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
20			SH		1.84			(20') Silty SAND (SM); 5-gallon bucket soil sample collected from approximately 15 to 20 feet below ground surface.		
			SS		1.6	5	11	(22') CEC (22') Silty SAND (SM); mostly fine-coarse grained sand, some silt, trace clay, well-graded, medium dense, moist, white to gray, abundant mica and quartz.	PB-7 (22-24)	
			SS		1.7	6	17	(24') Silty SAND (SM); mostly fine-coarse grained sand, some silt, trace clay, well-graded, medium dense, moist, white to gray, abundant mica and quartz.	PB-7 (24-26)	375
25			SS		1.4	7	31	(25') 5-gallon bucket soil sample collected from approximately 20 to 25 feet below ground surface.	PB-7 (26-28)	
			SS		1	3	41	(26') Silty SAND (SM); mostly fine-coarse grained sand, some silt, trace clay, well-graded, dense, wet, white to gray, abundant mica and quartz.	PB-7 (28-30)	370
30			SS		1	37	50	(30') Silty SAND (SM); mostly fine-coarse grained sand, some silt, trace clay, very dense, wet, white to light brown to whitish-gray, abundant mica and quartz.	PB-7 (30-32)	
			SS		0.1	50/2.5		(32') Silty SAND (SM); mostly fine-coarse grained sand, some silt, trace clay, very dense, wet, white to light brown to whitish-gray, abundant mica and quartz.	PB-7 (32-34)	
35										365
40			CO		3		100	(37') MET ROCK (GNEISS); coarse grained, slightly weathered, hard, slightly fractured, dark biotite, light feldspar minerals, strong, light and dark banding, competent, fracture at ~37.8 and ~38.5 ft (not healed, narrow, clean, rough). Auger refusal at 37 feet below ground surface, cable tool (rock coring) started. Fractures at 37.8 and 38.5		360

NOTES: PB-7S is a stickup well located ~10ft away from PB-7 borehole.
NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-7S/PB-7 Page: 3 of 3
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Drilling Start Date: 01/10/2019 Drilling End Date: 01/14/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 59.6 Boring Diameter (in): 6.50 Static Water Level (ft): 24.51/NA DTW After Drilling (ft): 24.60/NA Top of Casing Elev. (ft) 402.88/NA Ground Elev. (ft): 399.7/NA Location (X,Y): 1163831.3, 2556186.2	Well Depth (ft): 33 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
40			CO	5			100	(40') MET ROCK (GNEISS); coarse grained, fresh, hard, unfractured, dark biotite, light feldspar minerals, strong, light and dark banding, competent, mechanical break.		355
45				4.5			90	(45') MET ROCK (GNEISS); coarse grained, fresh, hard, unfractured, dark biotite, light feldspar minerals, strong, light and dark banding, competent, mechanical break.		350
50				5			100	(50') MET ROCK (GNEISS); coarse grained, fresh, hard, unfractured, dark biotite, light feldspar minerals, strong, light and dark banding, competent, mechanical break.		345
55				4.6			100	(55') MET ROCK (GNEISS); coarse grained, fresh, hard, unfractured, dark biotite, light feldspar minerals, strong, light and dark banding, competent, mechanical break.		340
60							(59.6') Boring terminated. Well installed on 01/14/2019			

NOTES: PB-7S is a stickup well located ~10ft away from PB-7 borehole.
 NA = Not Applicable

Eastings and Northing in NAD 83.
 Elevation in NAVD 88.

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 1 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 398.2(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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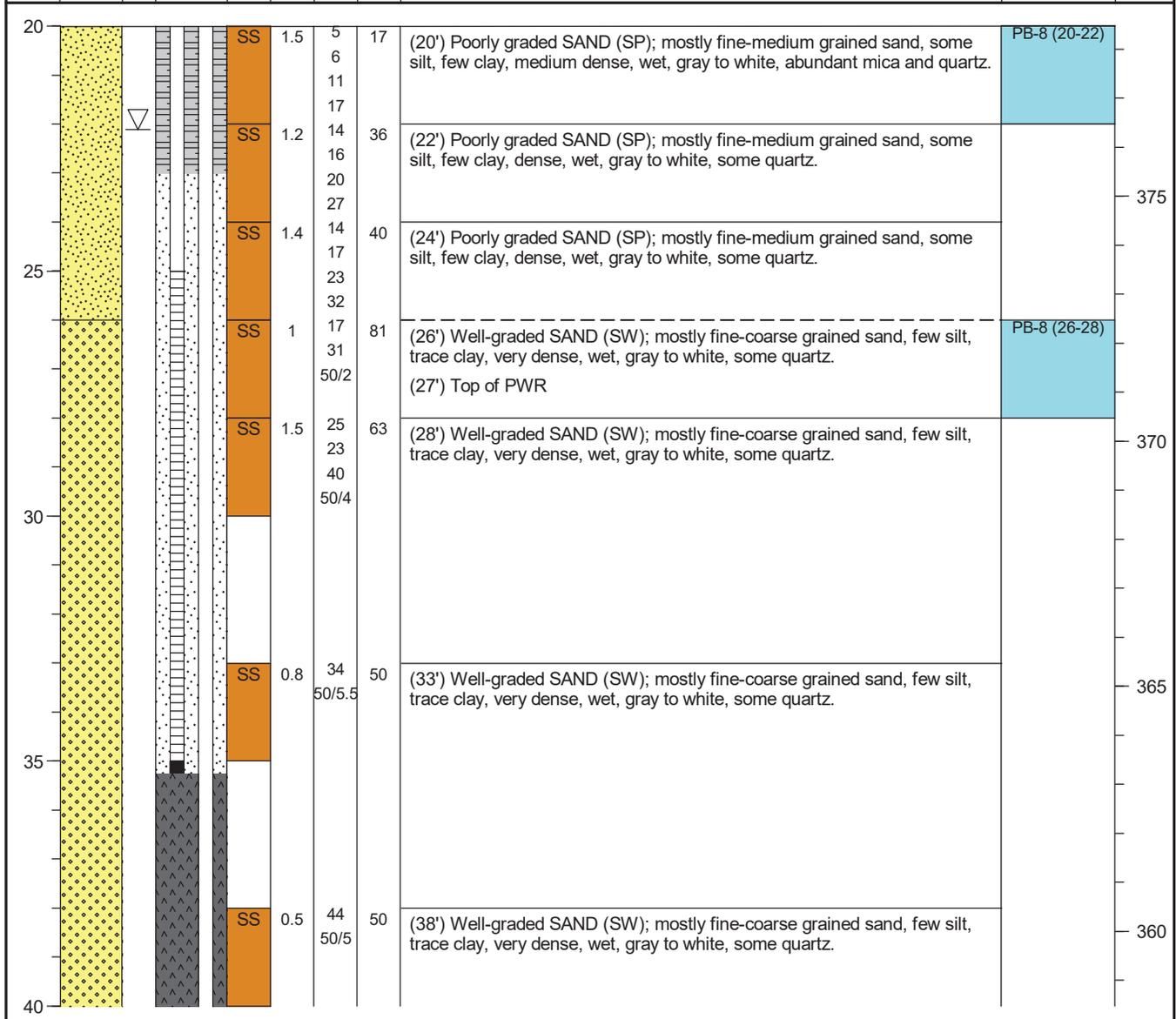
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)
0				SS	2	3	7	(0') Elastic SILT (MH); trace fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, reddish, few roots and mica.		
				SS	2	3	10	(2') Elastic SILT (MH); trace fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, reddish, abundant mica.	PB-8 (2-4)	395
				SS	2	5	19	(4') Elastic SILT (MH); trace fine-coarse sand, mostly silt, few clay, low plasticity, stiff, moist, reddish, black mottles.		
5				SS	2	4	11	(5') 5-gallon bucket soil sample collected from approximately 0 to 5 feet below ground surface		
				SS	2	4	11	(6') Elastic SILT (MH); trace fine-coarse sand, mostly silt, few clay, low plasticity, stiff, moist, reddish, black mottles.		
				SS	2	3	8	(8') Elastic SILT with sand (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, yellowish-brown, abundant mica.	PB-8 (8-10)	390
10				SH	0.84			Switched from 4 1/4 auger to 3 1/4 auger. Shelby tube discarded.		
				SS	2	3	6	(12.5') SILT (ML); few fine-coarse sand, mostly silt, few clay, nonplastic, soft, moist, yellowish-brown, abundant mica.	PB-8 (12-12.5) PB-8 (12.5-14)	385
15				SH	1.58					
				SS	1.8	4	19	(16') Well-graded SAND (SW); mostly fine-coarse grained sand, some silt, trace clay, medium dense, wet, yellowish-brown, abundant mica and quartz.	PB-8 (16-18)	
				SS	1.5	7	19	(18') Well-graded SAND (SW); mostly fine-coarse grained sand, some silt, trace clay, medium dense, wet, yellowish-brown, abundant mica and quartz.	PB-8 (18-22)	380

NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 2 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 401.74(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			

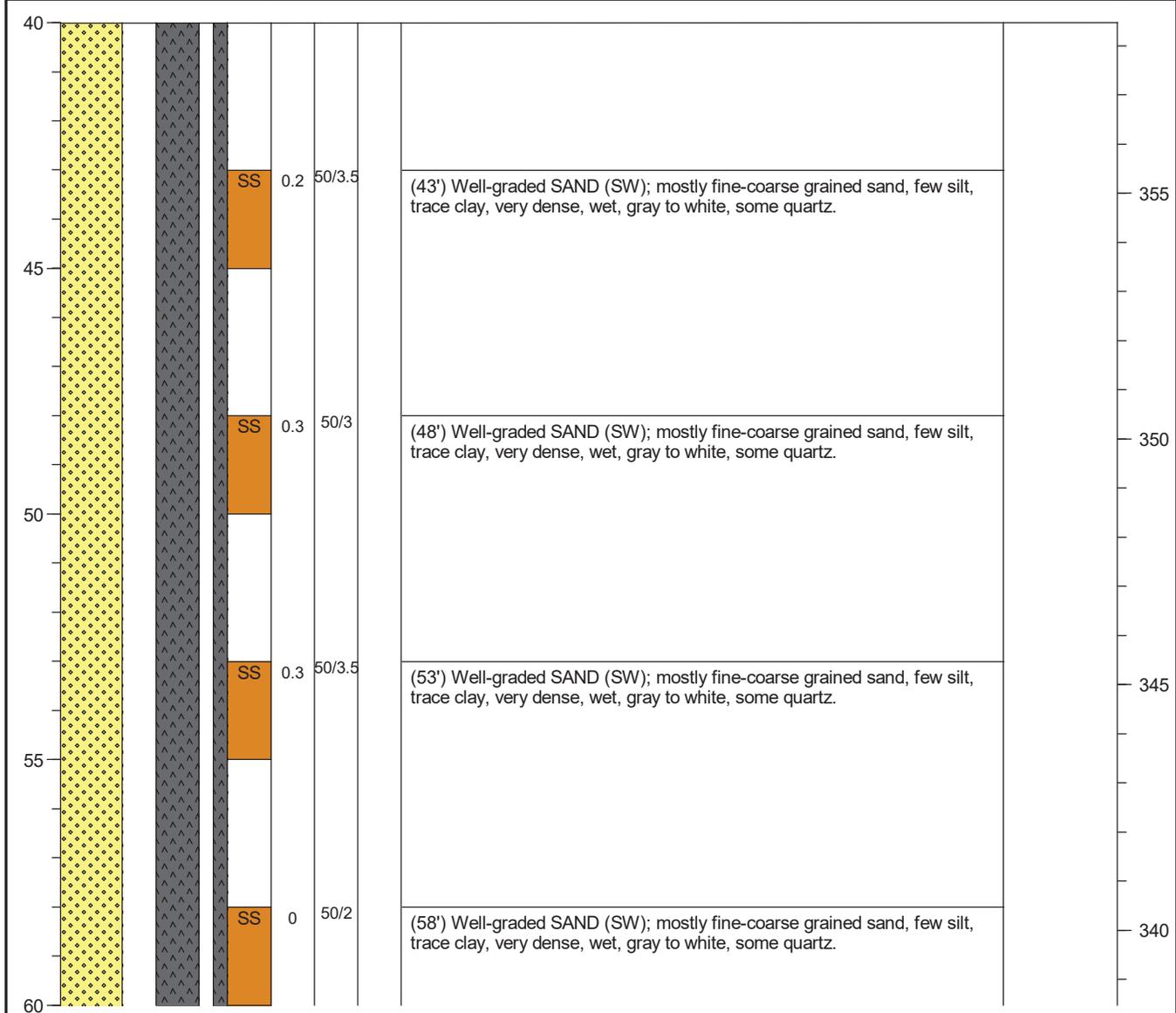


NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 3 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 398.2(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

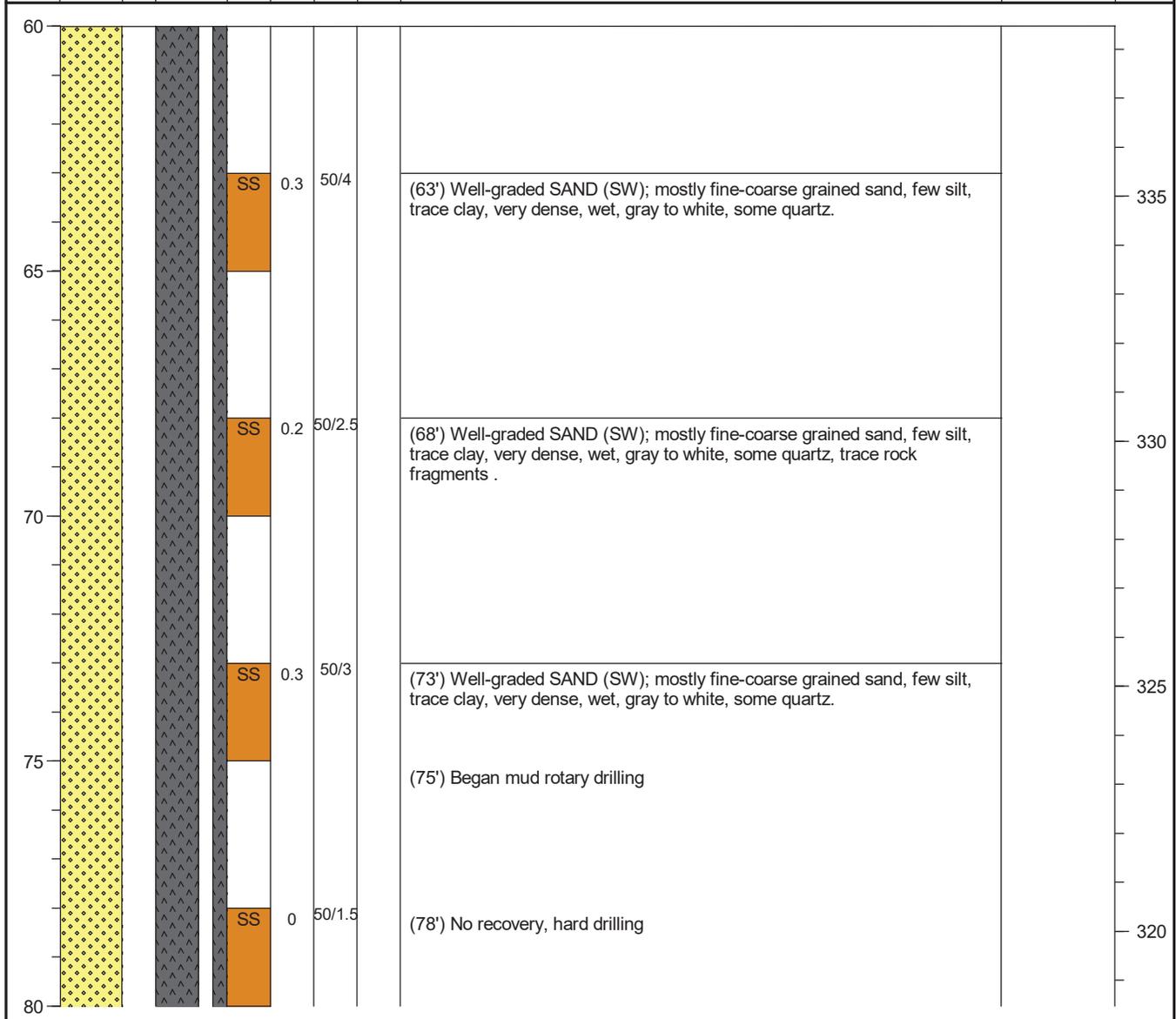


NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 4 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 398.2(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)

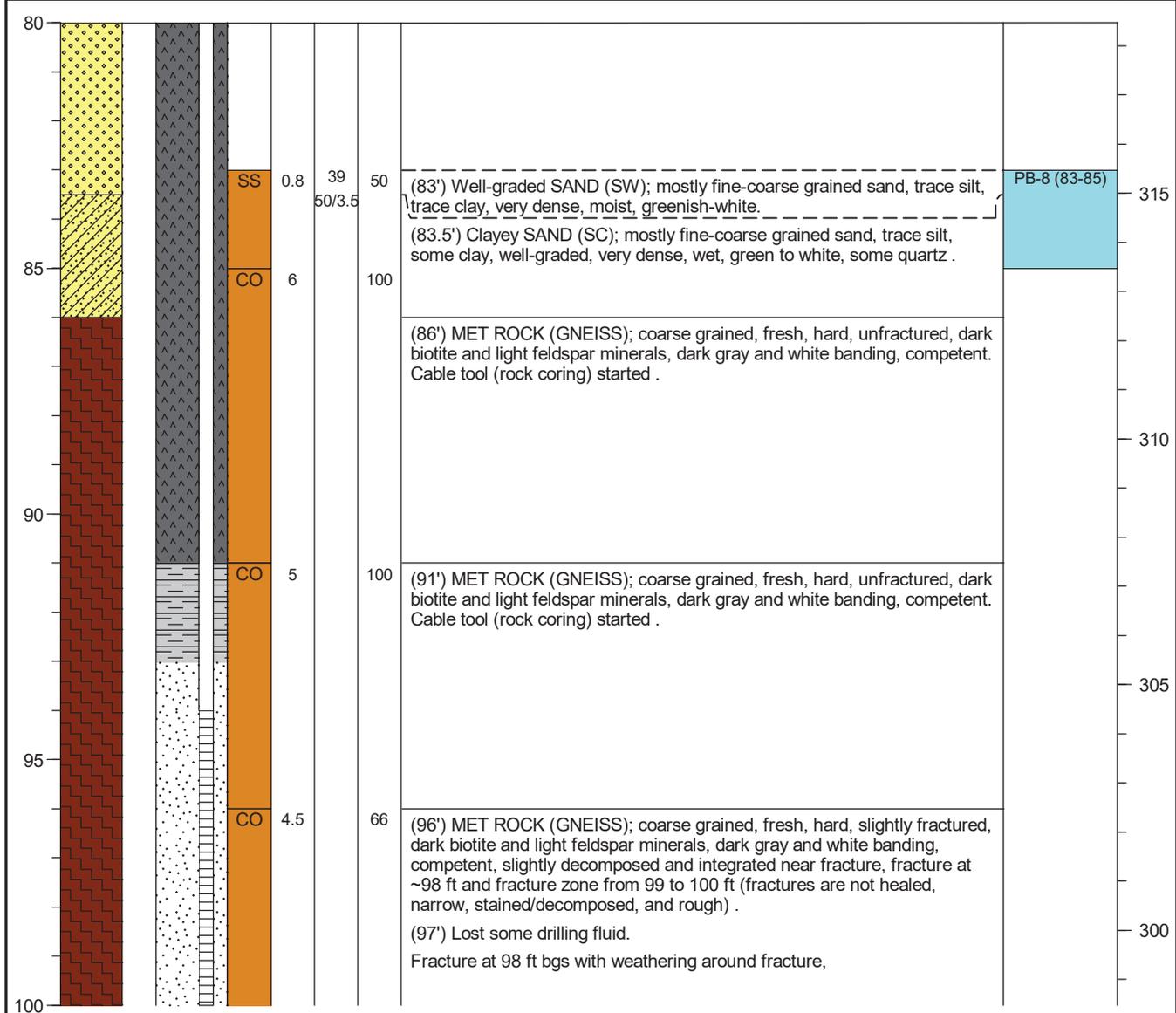


NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 5 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 401.74(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			

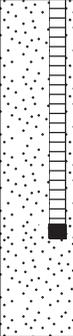


NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-8S/PB-8D Page: 6 of 6
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Drilling Start Date: 01/06/2019 Drilling End Date: 01/08/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 106 Boring Diameter (in): 6.50 Static Water Level (ft): 22.05/22.11 DTW After Drilling (ft): 22.60/14.00 Top of Casing Elev. (ft): 401.82(PB-8S) 398.2(PB-8D) Ground Elev. (ft): 398.6(PB-8S) 398.2(PB-8D) Location (X,Y): 1163018.2, 2556792.3(PB-8S) 1163024.4, 2556786.7(PB-8D)	Well Depth (ft): 35/106 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			

100				CO	4.7		88	(101') MET ROCK (GNEISS); coarse grained, fresh, hard, slightly fractured, dark biotite and light feldspar minerals, dark gray and white banding, competent, slightly decomposed and integrated near fracture, fracture at ~103, 104.5, and 104.7 ft (fractures are not healed, narrow, stained/decomposed, and rough) . (102') Lost some drilling fluid Fracture at 103, 104.5, and 104.7 ft bgs.		295
105								(106') Boring terminated.		290
110										

NOTES: PB-8S and PB-8D are stickup wells, PB-8S is ~10ft away from PB-8D well. Depth to water at PB-8S is 22.6 feet below ground surface.
 NA = Not Applicable
 Easting and Northing in NAD 83.
 Elevation in NAVD 88.

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-10S/PB-10D Page: 1 of 5
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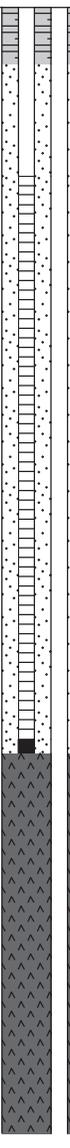
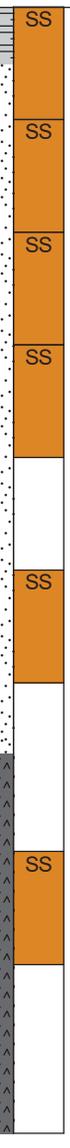
Drilling Start Date: 01/16/2019 Drilling End Date: 01/17/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 91 Boring Diameter (in): 6.50 Static Water Level (ft): 9.91/10.04 DTW After Drilling (ft): 9.70/9.70 Top of Casing Elev. (ft): 400.91(PB-10S) 400.31(PB-10D) Ground Elev. (ft): 397.6(PB-10S) 397.5(PB-10D) Location (X,Y): 1163588.9, 2558551.2(PB-10S) 1163593.4, 2558546.7(PB-10D)	Well Depth (ft): 33/85 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
0				SS	2	3	3	(0') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, very soft, moist, reddish, some roots.	PB-10 (0-2)	
				SS	2	2	7	(2') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, reddish.	PB-10 (2-4)	395
				SS	2	3	10	(4') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, yellowish-brown. (5') 5-gallon bucket soil sample collected from approximately 0 to 5 feet below ground surface.	PB-10 (4-6)	
				SS	2	8	26	(6') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, medium stiff, moist, yellowish-brown, black mottles.	PB-10 (6-8)	390
				SH	2			(10') CEC		
				SS	2	4	14	(10') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, medium stiff, wet, yellowish-brown, few mica.	PB-10 (10-12)	
				SS	1.6	3	11	(12') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, low plasticity, medium stiff, wet, yellowish-brown, abundant mica.	PB-10 (12-14)	385
				SS	2	6	23	(14') Elastic SILT (MH); few fine-coarse sand, mostly silt, few clay, medium plasticity, medium stiff, wet, light gray to light brown, abundant mica.	PB-10 (14-16)	
				SS	2	8	17	(15') 5-gallon bucket soil sample collected from approximately 10 to 15 feet below ground surface.	PB-10 (16-18)	
				SH	1.66	8		(16') Clayey SAND (SC); mostly fine grained sand, trace silt, some clay, medium dense, wet, greenish-gray, abundant mica.		380
20								(20') CEC		

NOTES: PB-10S and PB-10D are stickup wells, PB-10S is ~10ft away from PB-10D well. Depth to water at PB-10S is 9.7 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-10S/PB-10D Page: 2 of 5
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Drilling Start Date: 01/16/2019 Drilling End Date: 01/17/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 91 Boring Diameter (in): 6.50 Static Water Level (ft): 9.91/10.04 DTW After Drilling (ft): 9.70/9.70 Top of Casing Elev. (ft): 400.91(PB-10S) 400.31(PB-10D) Ground Elev. (ft): 397.6(PB-10S) 397.5(PB-10D) Location (X,Y): 1163588.9, 2558551.2(PB-10S) 1163593.4, 2558546.7(PB-10D)	Well Depth (ft): 33/85 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)
20				SS	2	4	19	(20') Clayey SAND (SC); mostly fine grained sand, trace silt, some clay, medium dense, wet, greenish-gray to light brown, black mottles, abundant mica. 5-gallon bucket soil sample collected from approximately 15 to 20 feet below ground surface.	PB-10 (20-22)	
11				SS	1.6	3	37	(22') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, dense, wet, light brown, abundant mica.	PB-10 (22-24)	375
25				SS	1.4	41	72	(24') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, very dense, wet, light brown, abundant mica.	PB-10 (24-26)	
				SS	0.3	50/3		(26') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, very dense, wet, light brown, abundant mica.	PB-10 (26-28)	370
30				SS	0.3	50/3		(30') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, very dense, wet, dark brown, abundant mica.	PB-10 (30-32)	
35				SS	0.3	50/3		(35') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, very dense, wet, dark brown, abundant mica, soft drilling (30-35).	PB-10 (35-37)	365
40										360

NOTES: PB-10S and PB-10D are stickup wells, PB-10S is ~10ft away from PB-10D well. Depth to water at PB-10S is 9.7 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-10S/PB-10D Page: 3 of 5
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Drilling Start Date: 01/16/2019 Drilling End Date: 01/17/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 91 Boring Diameter (in): 6.50 Static Water Level (ft): 9.91/10.04 DTW After Drilling (ft): 9.70/9.70 Top of Casing Elev. (ft): 400.91(PB-10S) 400.31(PB-10D) Ground Elev. (ft): 397.6(PB-10S) 397.5(PB-10D) Location (X,Y): 1163588.9, 2558551.2(PB-10S) 1163593.4, 2558546.7(PB-10D)	Well Depth (ft): 33/85 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)



NOTES: PB-10S and PB-10D are stickup wells, PB-10S is ~10ft away from PB-10D well. Depth to water at PB-10S is 9.7 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-10S/PB-10D Page: 4 of 5
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Drilling Start Date: 01/16/2019 Drilling End Date: 01/17/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 91 Boring Diameter (in): 6.50 Static Water Level (ft): 9.91/10.04 DTW After Drilling (ft): 9.70/9.70 Top of Casing Elev. (ft): 400.91(PB-10S) 400.31(PB-10D) Ground Elev. (ft): 397.6(PB-10S) 397.5(PB-10D) Location (X,Y): 1163588.9, 2558551.2(PB-10S) 1163593.4, 2558546.7(PB-10D)	Well Depth (ft): 33/85 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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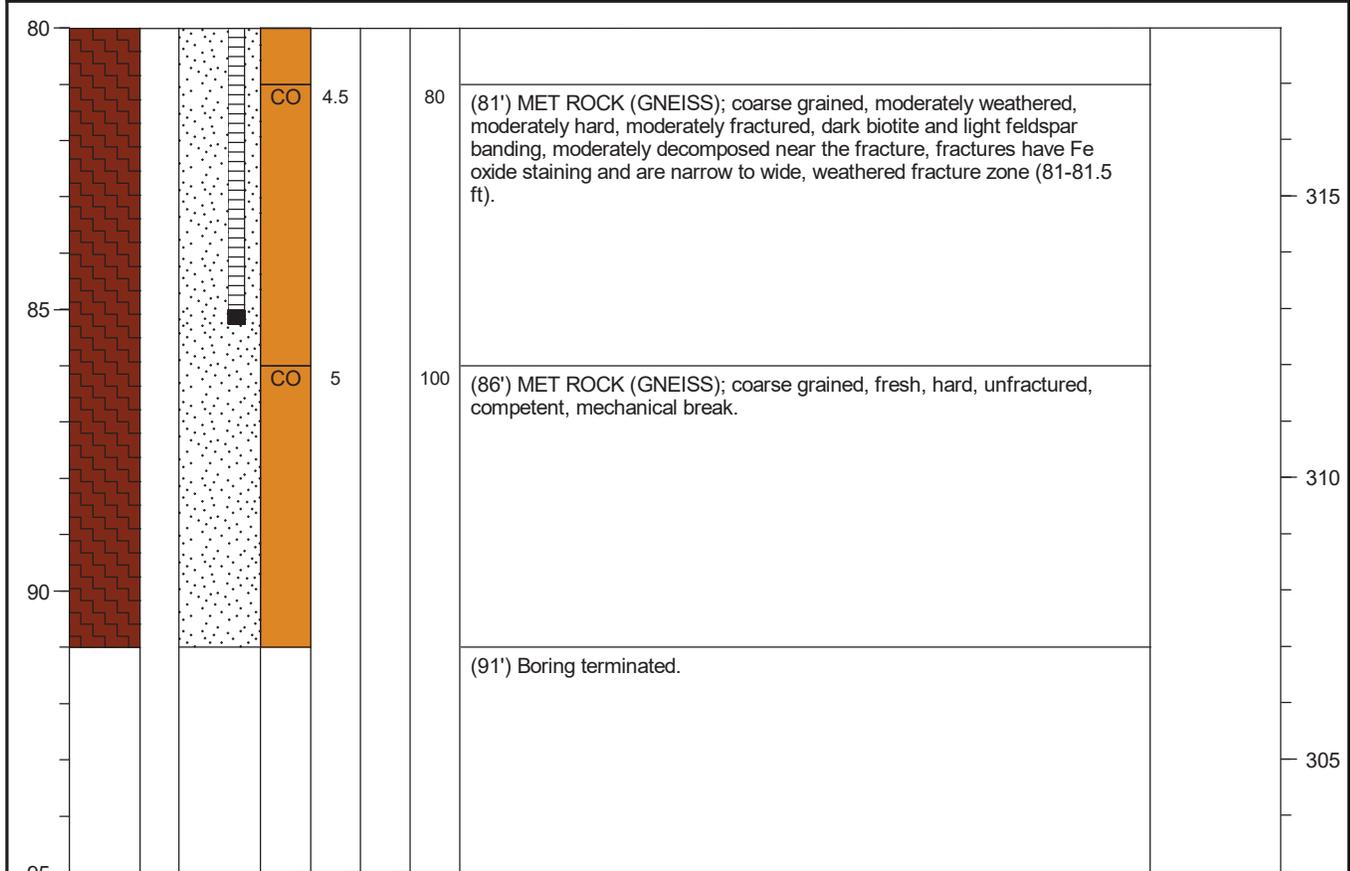
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
60				SS	0.2	50/2		(60') Well-graded SAND (SW); mostly fine-coarse grained sand, trace silt, few clay, very dense, wet, dark brown, abundant mica.	PB-10 (60-62)	
								(62') Began mud rotary drilling.		
				SS	1.3	20 38 50/4	88	(63') Poorly graded SAND (SP); mostly fine-coarse grained sand, very dense, wet, light gray to white, weathered rock fragments (gneiss), abundant mica and quartz.	PB-10 (63-65)	335
65										
				CO	2.5		14	(67.5') MET ROCK (GNEISS); coarse grained, moderately weathered, moderately hard, intensely fractured, dark biotite and light feldspar banding, moderately decomposed near the top, fractures have Fe oxide staining and are narrow to wide. Cable tool (rock coring) started.		330
70										
				CO	3.5		20	(71') MET ROCK (GNEISS); coarse grained, moderately weathered, moderately hard, moderately fractured, dark biotite and light feldspar banding, moderately decomposed near fracture, fractures have clay filling and are narrow to wide.		325
75										
				CO	4.75		54	(76') MET ROCK (GNEISS); coarse grained, moderately weathered, moderately hard, moderately fractured, dark biotite and light feldspar banding, fractures have clay filling and Fe oxide staining and are narrow to wide.		320
80										

NOTES: PB-10S and PB-10D are stickup wells, PB-10S is ~10ft away from PB-10D well. Depth to water at PB-10S is 9.7 feet below ground surface.
 NA = Not Applicable

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-10S/PB-10D Page: 5 of 5
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Drilling Start Date: 01/16/2019 Drilling End Date: 01/17/2019 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 91 Boring Diameter (in): 6.50 Static Water Level (ft): 9.91/10.04 DTW After Drilling (ft): 9.70/9.70 Top of Casing Elev. (ft): 400.91(PB-10S) 400.31(PB-10D) Ground Elev. (ft): 397.6(PB-10S) 397.5(PB-10D) Location (X,Y): 1163588.9, 2558551.2(PB-10S) 1163593.4, 2558546.7(PB-10D)	Well Depth (ft): 33/85 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE	
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)		Lab Sample	ELEV. (ft msl)



NOTES: PB-10S and PB-10D are stickup wells, PB-10S is ~10ft away from PB-10D well. Depth to water at PB-10S is 9.7 feet below ground surface.
 NA = Not Applicable

Easting and Northing in NAD 83.
 Elevation in NAVD 88.

 <p>Geosyntec consultants engineers scientists innovators</p>	Client: Georgia Power Company Project: Plant Branch CCR Landfill Site Investigation Address: 1100 Milledgeville Rd, Milledgeville	WELL LOG Well No. PB-13S/PB-13D Page: 1 of 6
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Drilling Start Date: 12/10/2018 Drilling End Date: 12/18/2018 Drilling Company: Thompson Engineering Drilling Method: Hollow Stem Auger Drilling Equipment: D-50 Driller: Phil Pitts Logged By: Nardos Tilahun	Boring Depth (ft): 107.8 Boring Diameter (in): 6.50 Static Water Level (ft): 7.19/7.74 DTW After Drilling (ft): 7.40/7.40 Top of Casing Elev. (ft): 373.31(PB-13S) 373.77(PB-13D) Ground Elev. (ft): 370.8(PB-13S) 371.1(PB-13D) Location (X,Y): 1162084.4, 2556626.1(PB-13S) 1162084.5, 2556638.8(PB-13D)	Well Depth (ft): 50/97 Well Diam. (in)/Screen Slot (in): 2.0/0.010 Riser Material: Sch 40 PVC Screen Material: Sch 40 PVC Slotted Sanitary Seal: Bentonite Pellets Filter Pack: Sand Sampling Method(s): SS/SH/CO
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DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT				SOIL/ROCK VISUAL DESCRIPTION	MEASURE Lab Sample	ELEV. (ft msl)
				Sample Type	Recovery (ft)	Blow Counts	N Value RQD (%)			
0				SS	2	2	10	(0') Sandy elastic SILT (MH); some fine-coarse sand, mostly silt, few clay, low plasticity, soft, moist, reddish, some organic matter.		370
				SS	2	6	16	(2') Sandy elastic SILT (MH); some fine-coarse sand, mostly silt, few clay, low plasticity, medium stiff, moist, yellowish-red to red, mica.	PB-13 (2-4)	
				SS	2	4	15	(4') Sandy elastic SILT (MH); some fine-coarse sand, mostly silt, few clay, low plasticity, medium stiff, moist, yellowish-red to red, mica.		
5				SS	2	2	10	(5') Elastic SILT with sand (MH); little fine sand, mostly silt, few clay, low plasticity, medium stiff, moist, yellowish-brown, 5-gallon bucket soil sample collected from approximately 0 to 5 feet below ground surface.	PB-13 (6-8)	365
				SS	2	2	8	(6') Elastic SILT with sand (MH); little fine sand, mostly silt, few clay, low plasticity, medium stiff, moist, yellowish-brown.		
				SS	2	3	14	(8') Sandy lean CLAY (CL); some fine sand, trace silt, mostly clay, medium plasticity, medium stiff, moist, light greenish.		
10				SS	2	3	18	(10') Lean CLAY (CL); some fine-coarse sand, trace silt, mostly clay, medium plasticity, stiff, moist, light greenish.	PB-13 (10-12)	360
				SH	2	8	10	(10.5') Clayey SAND (SC); mostly fine-coarse grained sand, trace silt, some clay, well-graded, medium dense, moist, light greenish.		
				SH	2	12	12	(12') Clayey SAND (SC).		
15				SS	2	2	7	(14') Clayey SAND (SC); mostly fine-coarse grained sand, trace silt, some clay, well-graded, loose, moist, light green to light brown.		
				SS	2	3	4	(15') 5-gallon bucket soil sample collected from approximately 10 to 15 feet below ground surface.		
				SS	1.5	2	7	(16') Well-graded SAND (SW); mostly fine-coarse grained sand, few silt, trace clay, loose, wet, dark gray to grayish-white, abundant mica and quartz.	PB-13 (16-18)	355
				SH	2	5	6		PB-13 (18-20)	
20						6				

NOTES: PB-13S and PB-13D are stickup wells, PB-13S is ~10ft away from PB-13D well. Depth to water at PB-13S is 7.4 feet below ground surface.
 NA = Not Applicable

C. GROUNDWATER SAMPLING PROCEDURE

Groundwater sampling will be conducted using the most current applicable USEPA Region 4 SESD Field Branches Quality System and Technical Procedures as a guide (<https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches>). The following procedures describe the general methods associated with groundwater sampling at the Site. Prior to sampling, the well must be evacuated (purged) to ensure that representative groundwater is obtained. Any item coming in contact with the inside of the well casing or the well water will be kept in a clean container and handled only with gloved hands.

GPC will follow the procedures below at each well to ensure that a representative sample is collected:

1. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations and notify GPC if it appears that the well has been compromised.
2. Measure and record the depth to water in all wells to be sampled prior to purging using a water measuring device consisting of probe and measuring tape capable of measuring water levels with accuracy to 0.1 foot. Static water levels will be measured from each well, within a 24-hour period. The water level measuring device will be decontaminated prior to lowering in each well.
3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. All non-dedicated pumps and wiring will be decontaminated before use and between well locations in general accordance with USEPA Laboratory Services and Applied Science Division *Field Equipment Cleaning and Decontamination* (LSASDPROC-205-R4), or the latest version of the document.
4. Measure Water Level: Immediately prior to purging, measure the water level again with the pump in the well. Leave the water level measuring device in the well.
5. Purge Well: Begin pumping the well at approximately 100 to 500 milliliters per minute (mL/min). Monitor the water level continually. Maintain a steady flow rate that results in a stabilized water level with 0.3 feet or less of variability. Avoid entraining air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.
6. Monitor Indicator Parameters: Monitor and record the field indicator parameters [turbidity, temperature, specific conductance, pH, oxidation-reduction potential (ORP), and dissolved oxygen (DO)] approximately every three to five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:

±0.1 for pH

±5% for specific conductance (conductivity)

±10% or ±0.2 mg/L (whichever is greater) for DO where DO>0.5mg/L. If DO<0.5mg/L no stabilization criteria apply

<5 NTU for turbidity

Temperature – Record only, not used for stabilization criteria

ORP – Record only, not used for stabilization criteria.

7. Collect samples at a flow rate between 100 and 200 mL/min according to the most current version of USEPA Region 4 SEDS guidance document, *Operating Procedure – Groundwater Sampling* (EPA, SEDSPROC-301-R4), and such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.
8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results (i.e., >10 NTU), duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. A new filter must be used for each well and each sampling event. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity. Additional details related to managing for elevated turbidity is discussed below.
9. All sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.
10. Sample containers and preservative will be appropriate for the analytical method being used.
11. Information contained on sample container labels will include:
 - a. Name of facility
 - b. Date and time of sampling
 - c. Sample description (well number)
 - d. Sampler's initials
 - e. Preservatives
 - f. Analytical method(s)
12. After samples are collected, samplers will remove all non-dedicated equipment. Upon completion of all activity the well will be closed and locked.

13. Samples will be delivered to the laboratory following appropriate COC and temperature control requirements. The goal for sample delivery will be within 48 hours of collection; however, at no time will samples be analyzed after the method-prescribed hold time.

Throughout the sampling process, new latex or nitrile gloves will be worn by the sampling personnel. A clean pair of new, disposable gloves will be worn each time a different location is sampled, and new gloves donned prior to filling sample bottles. Gloves will be discarded after sampling each well and before sampling the next well.

The goal when sampling is to attain a turbidity of less than 5 NTU; however, samples may be collected where turbidity is less than 10 NTU and the stabilization criteria described above are met.

If sample turbidity is greater than 5 NTU and all other stabilization criteria have been met, samplers will continue purging for 3 additional hours in order to reduce the turbidity to 5 NTU or less.

- If turbidity remains above 5 NTU but is less than 10 NTU, and all other parameters are stabilized, the well can be sampled.
- Where turbidity remains above 10 NTU, an unfiltered sample will be collected followed by a filtered sample that has passed through an in-line 0.45-micron filter attached to the discharge (sample collection) tube. Data from filtered samples will only be used to quantify the effects of turbidity on sample results.

Samplers will identify the sample bottle as containing a filtered sample on the sample bottle label and on the COC form.