

GROUNDWATER MONITORING PLAN

PLANT YATES
ASH POND 2

COWETA COUNTY, GEORGIA

FOR



Georgia
Power

FEBRUARY 2023



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Approved

Solid Waste Management Program

Approved By: _____



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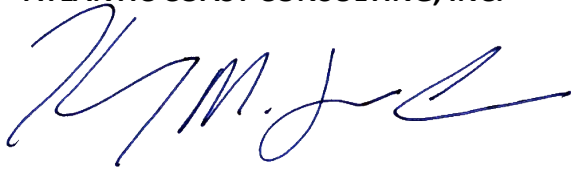
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I. CERTIFICATION

I hereby certify that this Groundwater Monitoring Plan was prepared by, or under the direct supervision of, a Qualified Groundwater Scientist, in accordance with the Georgia Environmental Protection Division (EPD) Rules of Solid Waste Management. According to 391-3-4-.01, 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 the Georgia EPD Rules of Solid Waste Management, Chapter 391-3-4.10(6).

ATLANTIC COAST CONSULTING, INC.



Harry M. Jones, P.G.
Project Manager
Date: February 2, 2023



Richard T. Deason, P.E.
Reviewer
Date: February 2, 2023



1. INTRODUCTION

Groundwater monitoring is required by the Georgia Environmental Protection Division (EPD) to detect and quantify potential changes in groundwater chemistry. This Groundwater Monitoring Plan (plan) describes the groundwater monitoring program for the site. This plan meets the requirements of EPD rules and uses EPD's Manual for Ground Water Monitoring dated September 1991 as a guide. Groundwater monitoring well locations are presented on Figure A1 of Appendix A and well and piezometer construction details presented on Table A1 of Appendix A.

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 EPD rules (391-3-4), the EPD rules will take precedent.

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (CCR) (§257.90), which is incorporated in the Georgia State CCR Rule by reference, a detection monitoring well network for AP-2 has been installed and certified by a qualified groundwater scientist. The existing monitoring wells were installed following the guidelines presented herein. Additionally, 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 EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist. Currently, routine assessment monitoring is completed as required by 391-3-4.10(6)(a) and §257.95.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic and hydrogeologic conditions for this site are described in a separate Hydrogeological Assessment report for AP-2 (ACC, 2022). Existing impoundment AP-2 is located within Plant Yates property.

Plant Yates lies within the Inner Piedmont of western Georgia, immediately southeast of the Brevard Fault Zone, an inactive fault which forms the northern boundary of the Inner Piedmont and the Dadeville Complex lithologies. The rocks in the area have been subjected to several episodes of metamorphism and intrusion by igneous bodies, creating a complex geologic picture. Surface expressions of the joints are observed on topographic maps and aerial photos of the Plant Yates area.

Granitic gneiss and schist units have been identified in the Plant Yates area. Both units are covered by a thick layer of saprolite. The schist unit is a sequence of amphibolites interlayered with chlorite schists and other metasedimentary rocks. Amphibolites are well foliated and may be retrograded to chlorite. The granitic gneiss is metamorphosed light-gray granitic pluton of medium- to coarse-grained texture. The unit is exposed in outcrops that trend northeast.

A thin soil layer from one to two feet thick overlies a thick layer of saprolite. The saprolite, which extends to typical depths of 20-40 feet below ground surface, was formed from the weathering of the underlying metamorphic rocks. There is typically a zone of variable thickness (approximately 5-20 feet) of weathered rock between the saprolite and competent bedrock.

Shallow groundwater is typically encountered near the saprolite/weathered rock interface. Bedrock becomes increasingly competent with depth and movement of groundwater occurs only in fractures (i.e., secondary porosity). Recharge to the water-bearing zones in fractured bedrock takes place by seepage through the overlying mantle of soil/saprolite, or by direct entrance through openings in outcrops. Groundwater flow is directed toward the ponds, which are essentially valley fill areas. The ponds were established along a topographically low area formed by a tributary to the Chattahoochee River. A recent water table elevation contour map showing overall flow directions is provided in Appendix A, Figure A2. Average depth of the water table at Plant Yates varies with topography (range of approximately 5 to 50 feet below ground surface).

At the site, groundwater in the saturated overburden represents the uppermost aquifer. This uppermost aquifer is comprised of both residual soils, saprolite, and partially weathered rock, and is generally unconfined. It is recharged by precipitation stored in residual soils and typically discharges to streams. Groundwater stored in the overburden also recharges the underlying bedrock through preferentially weathered discontinuities in the bedrock and discharges to streams through inter-connected bedrock fractures. Hydraulic conductivity (K) is defined as the rate at which water can move through a permeable medium. In situ rising head and falling slug tests were performed at multiple locations at AP-2 to determine horizontal K values. Vertical K values for locations throughout Plant Yates were determined by laboratory testing of undisturbed overburden samples (Shelby Tubes) collected at multiple Plant Yates locations. The range in K values at these locations is small, indicating a fairly uniform hydrogeologic layers across the saprolite and weathered rock horizon (typically range from 10^{-3} cm/sec to 10^{-5} cm/sec). Appendix A, Table A1, Monitoring System Details, presents summaries of the K testing values from AP-2 monitoring wells and piezometers and laboratory test results for locations throughout Plant Yates. The values from the field and laboratory tests fall within the standard range of hydraulic conductivity values associated with a silty sand. Supporting data for the K testing values are provided in Appendix B, Hydraulic Conductivity Testing Results.

The horizontal hydraulic gradient across the former AP-2 was calculated utilizing groundwater elevation data measured during the February 2022 sampling event from PZ-01S to YGWA-14S, PZ-13S to YGWC-28S, and YGWA-14S to PZ-31S resulting with an average estimated horizontal gradient of 0.039 ft/ft.

Average groundwater flow velocity in the AP-2 area is based on K, lateral gradient (i) and effective porosity (P_e). The average horizontal K for the site is 157 feet/year, and the gradient across AP-2 (February 2022) was 0.039 ft/ft, and the effective porosity (n_e) was estimated at 0.20. The average groundwater velocity is calculated as:

$$V_{gw} = (K)(i)/n_e = ((157 \text{ ft/year}) (0.039 \text{ ft/ft})/0.20 \text{ ft/ft}) = 31 \text{ feet/year.}$$

The AP-2 uppermost aquifer potentiometric map for the February 2022 sampling event is provided on Appendix A, Figure A2. Upgradient groundwater flow direction, south of AP-2, is generally from the south southeast to the north-northwest. Upgradient groundwater flow, north of AP-2, flows from the northeast to the southwest towards AP-2. Hydraulic gradients are steeper on the south side of AP-2 due to steeper topography.

3. WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost occurrence of groundwater beneath the site. Locations were selected based on the former waste unit layout and site geologic and hydrogeologic considerations. Locations were chosen to serve as upgradient (GWA designation) or downgradient (GWC designation) based on groundwater flow direction determined by potentiometric evaluation. The well naming nomenclature is based on Georgia EPD's Industrial Waste Disposal Site Design and Operations Plan – Supplemental Data for Solid Waste Handling Permit (undated).

A map depicting monitoring well locations for AP-2 is provided on Figure A1 in Appendix A. A tabulated list of individual monitoring wells and piezometers with well construction details such as location coordinates, top-of-casing elevations, well depths, and screened intervals is included on Table A1 of Appendix A. Any change to the groundwater monitoring network must be made by a minor modification to the permit pursuant to 391-3-4.10(6).

There are seven upgradient wells located upgradient and to the south and southwest of AP-2, and 12 additional site-wide upgradient wells located within Plant Yates that are included in the overall upgradient monitoring network system. All 19 upgradient wells are included on Table A1 and Figure A1 of Appendix A. Boring logs and well construction diagrams for the existing monitoring wells are provided in Appendix C, Boring Logs, Well Construction Diagrams, EPD Bond Continuation Certificates, and Survey Data. Copies of the driller's EPD bond continuation certificates from the period of well installation (2007 – 2016) and June 2020 well re-survey data certified by Georgia Registered Land Surveyor are also included in Appendix C.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The existing monitoring wells were installed following USEPA Region 4 Science and Ecosystem Support Division (SESD) Operating Procedure for Design and Installation of Monitoring Wells (USEPA, SESDGUID-101-R1) as a general guide for best practices. Monitoring well and piezometer construction data are provided on Table A1 of Appendix A.

4.1 DRILLING

A variety of well drilling methods are available for the purpose of installing groundwater wells. Drilling methodology may include, but not be limited to: hollow stem augers, direct push, air rotary, mud rotary, or roto sonic techniques. The drilling method shall minimize the disturbance of subsurface materials and shall not cause impact to the 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-R1 as a general guide for best practices. Drilling equipment shall be decontaminated before use and between borehole locations using the procedures described in the latest version of the Region 4 USEPA SESD Operating Procedure for Field Equipment Cleaning and Decontamination as a guide.

Sampling and/or coring may be used to help determine the stratigraphy and geology. Samples will be logged by trained personnel working under the direction of a Professional Geologist/Engineer registered in the State of Georgia. Screen depths will be chosen based on the depth of the uppermost aquifer.

Drilling and well installation activities will be directed by a qualified groundwater scientist. All drilling for any subsurface hydrologic investigation, installation or abandonment of groundwater monitoring wells must be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council.

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 International (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 EPD.

WELL INTAKE DESIGN

The design and construction of the intake of the groundwater wells shall: (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 shall not exceed 10 feet without justification as to why a longer screen is necessary (e.g., significant variation in groundwater level). If the above prove ineffective for developing a well with sufficient yield or acceptable turbidity, further steps will be taken to ensure 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 may be used 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 latest version of the Region 4 USEPA SESD Operating Procedure for Design and Installation of Monitoring Wells as a general guide.

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 hole 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 of filter pack depth will be measured, 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 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 zone. If dry bentonite is used, the bentonite must be hydrated with potable water prior to grouting the remaining annulus.

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 2 feet above the bentonite seal and injecting grout at low pressure/velocity.

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 pressure in the well to equalize with atmospheric pressure. 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 details attached in Appendix D1, Groundwater Monitoring Well Detail and Appendix D2, Groundwater Monitoring Well Detail Flush-Mount Surface Completion, illustrates the general design and construction details for a monitoring well.

WELL DEVELOPMENT

Well development will be conducted under supervision of a certified groundwater professional. 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. Development can be discontinued once a turbidity of less than 10 NTU is achieved. Additionally, the stabilization criteria contained in Appendix E, Groundwater Sampling Procedures, 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. Well development data will be included in installation documentation reports.

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, an equal volume purged from the well.

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

4.3 ABANDONMENT

Per Georgia Rule 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 Georgia EPD. Well

abandonment will be directed by a qualified groundwater scientist, and in accordance with the Official Code of Georgia Annotated (O.C.G.A) § 12-5-120, 1985.

4.4 DOCUMENTATION

The following information documenting the abandonment, construction, development, and survey of each well will be submitted to EPD by a qualified groundwater scientist within 60 days after completing all planned well installations and abandonments.

- Well identification,
- Name of drilling contractor and type of drill rig,
- Documentation stating that a Georgia-registered professional surveyor shall certify that the horizontal accuracy for the installed monitoring wells is 0.5 feet, and vertical accuracy for top of casing elevations to 0.01 feet using a known datum,
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council,
- Type of protective well cap and sump dimensions for each well,
- Dates of drilling and initial well emplacement,
- Drilling method and drilling fluid if used,
- Borehole diameter and well casing diameter,
- Well depth given to within an accuracy of 0.01 feet based upon survey from acceptable survey point,
- Lithologic logs,
- Well casing materials,
- Screen materials and design (i.e., interval in feet below ground surface and elevation),
- Screen length,
- Screen slot size,
- Filter pack material/size and volume (placement narrative),
- Seal emplacement method and type/volume of sealant,
- Surface seal and volumes/mix of annular seal material,
- Well development date and documentation that water quality field parameters meet well development criteria,
- Sealant materials and volume,
- Well turbidity following development,
- Narrative of well development method - specific well development,
- Documentation of ground surface elevation (± 0.01 feet),
- Documentation of top of casing elevation (± 0.01 feet), and
- Schematic of the well with dimensions

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 EPD.

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 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. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semi-annual during the post-CCR removal monitoring 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 USEPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), USEPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), ASTM, or other suitable analytical methods approved by the Georgia 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 Program (NELAP). 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	Semiannual Events
Field Parameters	Temperature	X	X
	pH	X	X
	Specific Conductance	X	X
	Turbidity	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	X ¹
	Arsenic	X	X ¹
	Barium	X	X ¹
	Beryllium	X	X ¹
	Cadmium	X	X ¹
	Chromium	X	X ¹
	Cobalt	X	X ¹
	Fluoride	X	X ¹
	Lead	X	X ¹
	Lithium	X	X ¹
	Mercury	X	X ¹
	Molybdenum	X	X ¹
	Selenium	X	X ¹
	Thallium	X	X ¹
Radium 226 & 228	X	X ¹	

1. As needed during assessment monitoring.

**TABLE 2
 ANALYTICAL METHODS**

Parameters	EPA Method Number
Boron	6010D/6020B
Calcium	7140/6010D/6020B
Chloride	300.0/300.1/9250/9251/9253/9056A
Fluoride	300.0/300.1/9214/9056A
pH	150.1field/9040C
Sulfate	9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	160/2540C
Antimony	7040/7041/6010D/6020B
Arsenic	7060A/7061A/6010D/6020B
Barium	7080A/7081/6010D/6020B
Beryllium	7090/7091/6010D/6020B
Cadmium	7130/7131A/6020B
Chromium	7190/7191/6010D/6020B
Cobalt	7200/7201/6010D/6020B
Fluoride	300.0/300.1/9214/9056
Lead	7420/7421/6010D/6020B
Lithium	6010D/6020B
Mercury	7470A/7471B
Molybdenum	6010D/6020B
Selenium	7740/7741A/6010D/6020B
Thallium	7840/7841/6010D/6020B
Radium 226 and 228 combined	903/9320/9315

6. SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in Appendix E, Groundwater Sampling Procedures. 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 EPD approval.

For groundwater sampling, positive gas displacement PVC, 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. The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

Per Georgia Rule 391-3-4-.10(6)(g) monitoring wells require replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the Georgia EPD. Well installation must be directed by a qualified groundwater scientist. A minor modification shall be submitted in accordance with Rule 391-3-4-.02(3)(b)(6) 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
- Notated date(s) and time(s) of sample transfer between individuals
- Signature of person(s) involved in the chain of possession

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

8. FIELD AND LABORATORY 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 20 samples.
- Field Blanks - Field blanks will be collected in the field using the same water source that is used for decontamination. The water will be 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 20 samples.

Calibration of field instruments will occur daily and follow the recommended (specific) instrument calibration procedures provided by the manufacturer and/or equipment manual specific to each instrument. Daily calibration will be documented on field forms and these field forms will be included in all groundwater monitoring reports. 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 provided as part of each groundwater report's quality control documentation.

The groundwater samples will be analyzed by licensed and accredited laboratories through the NELAP.

9. REPORTING RESULTS

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

1. 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.
2. A narrative of purging/sampling methodologies, which will include the type of sampling equipment used.
3. Discussion of results.
4. Recommendations for the future monitoring consistent with the Rules.
5. Potentiometric surface contour map for the aquifer being monitored, signed and sealed by a Georgia-registered P.G. or P.E.
6. 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.
7. Groundwater flow rate and direction calculations.
8. Identification of any groundwater wells that were installed or decommissioned during the preceding year, along with a narrative description of why these actions were taken.
9. 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).
10. If applicable, semiannual assessment monitoring results.
11. Any alternate source demonstration completed during the previous monitoring period, if applicable.
12. Laboratory Reports.
13. COC documentation.
14. Field sampling logs including field instrument calibration, indicator parameters, and parameter stabilization data.

15. Field logs and forms for each sampling event to include, but not limited to, well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling.
16. Documentation of non-functioning wells.
17. Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL).
18. Statistical analyses.
19. Certification by a qualified groundwater scientist.
20. Plume delineation (if applicable based on exceedances of groundwater protection standards)
21. Potable water well survey (annually, if applicable based on exceedances of groundwater protection standards)

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. All 19 upgradient wells at Plant Yates are included in site background. Statistical analysis techniques will be consistent with the USEPA document Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance (Unified Guidance) (USEPA, 2009).

According to EPD rules (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 hazardous constituent. The statistical test chosen shall be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that will be used include:

1. A 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 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 (such as prediction limits or control charts) 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).

An interwell statistical method will be used to 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 will be placed in the site's operating record pursuant to 391-3-4-.10(6). Figure 1, Statistical Analysis Plan Overview, includes a flowchart that depicts the process that will be followed to develop the site-specific plan. Figure 2, Decision Logic for Computing Prediction Limits, presents the logic that will be used to calculate site-specific statistical limits and test compliance results against those limits.

11. REFERENCES

- Arcadis U.S., Inc., 2022. 2022 Semiannual Groundwater Monitoring and Corrective Action Report, Plant Yates – Ash Pond 2. February 2022.
- ACC, Inc., 2022. *Hydrogeologic Assessment Report*. Ash Pond 2 Plant Yates.
- Georgia Environmental Protection Division (EPD), 1991. *Manual for Groundwater Monitoring*. (PP. 38).
- Georgia Rules and Regulations, 2018. Chapter 391-3-4, *Solid Waste Management*. Revised March 28, 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, 2013. *Operating Procedure for Design and Installation of Monitoring Wells*. SESDGUID-101-R1.
- United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2015. *Operating Procedure for Field Equipment Cleaning and Decontamination*. SESDPROC-205- R3.
- 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*.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

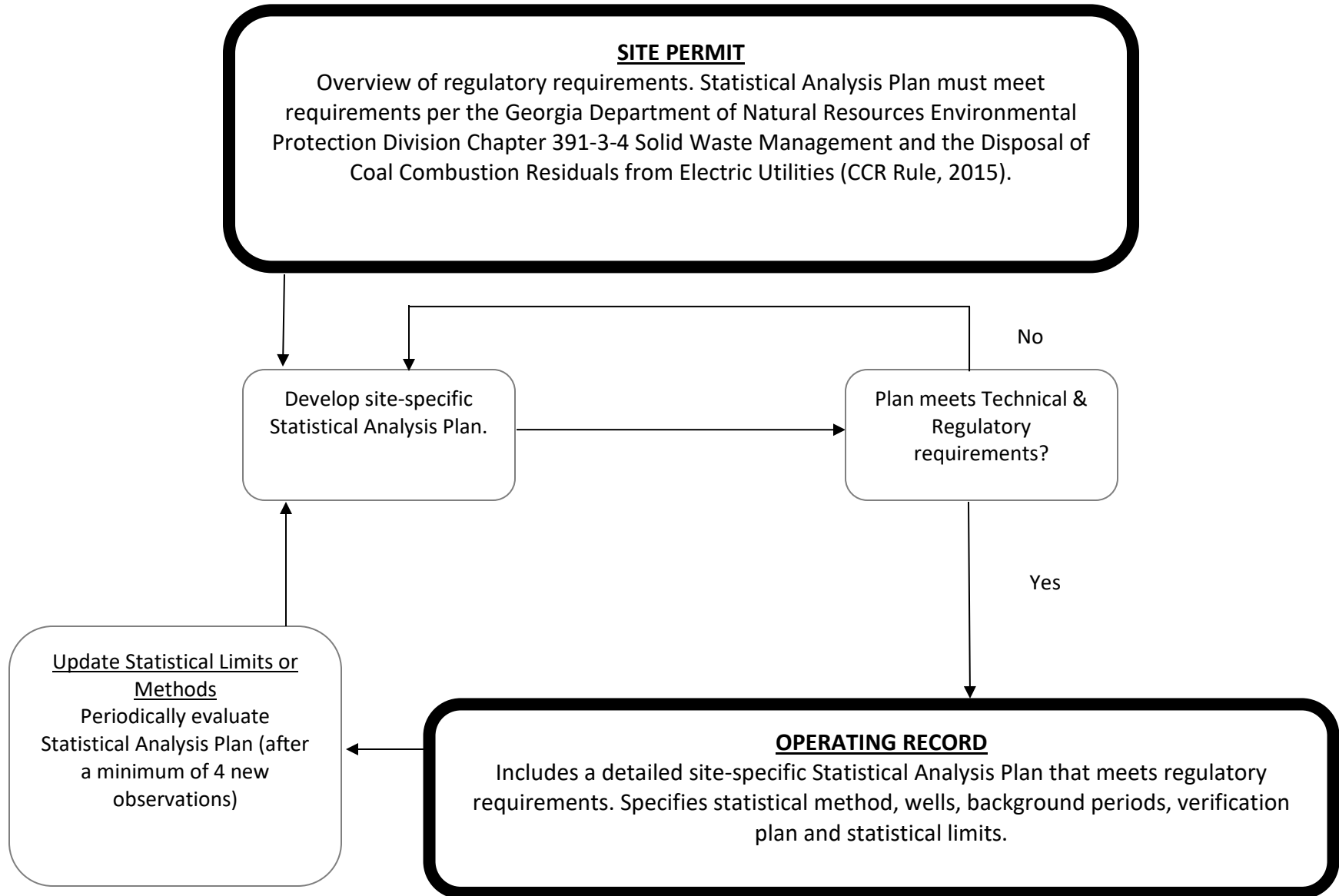
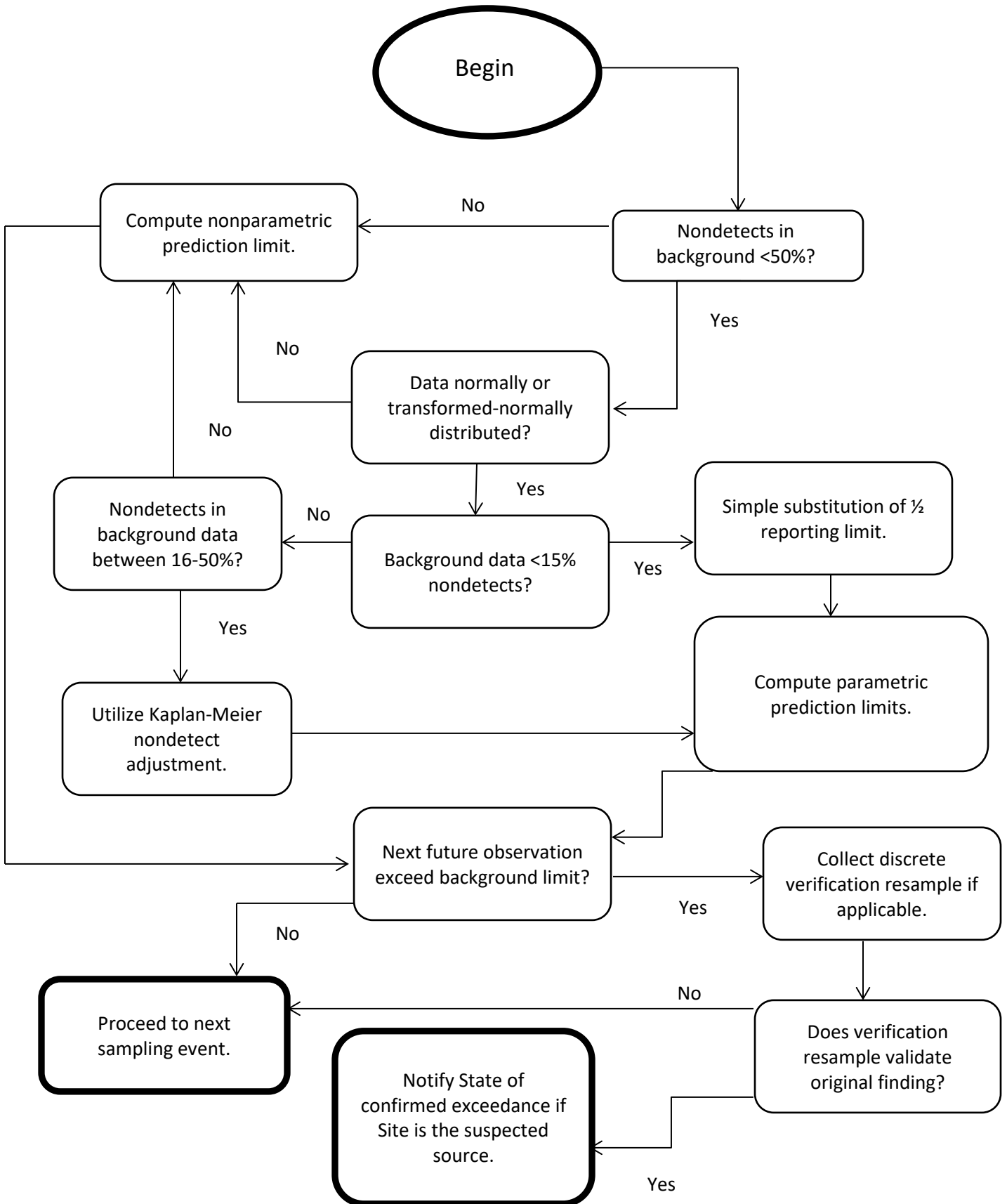


FIGURE 2. DECISION LOGIC FOR COMPUTING PREDICTION LIMITS



APPENDICES

APPENDIX A. MONITORING SYSTEM DETAILS

TABLE A1 MONITORING WELL AND PIEZOMETER NETWORK

FIGURE A1 MONITORING WELL NETWORK

FIGURE A2 FEBRUARY 2022 POTENTIOMETRIC SURFACE CONTOUR MAP

APPENDIX B. HYDRAULIC CONDUCTIVITY TESTING RESULTS

TABLE B1 HORIZONTAL HYDRAULIC CONDUCTIVITY DATA SUMMARY

TABLE B2 SITEWIDE VERTICAL HYDRAULIC CONDUCTIVITY DATA SUMMARY

APPENDIX C. BORING LOGS, WELL CONSTRUCTION DIAGRAMS, EPD BOND CONTINUATION CERTIFICATES AND SURVEY DATA

APPENDIX D1. GROUNDWATER MONITORING WELL DETAIL

APPENDIX D2. GROUNDWATER MONITORING WELL DETAIL FLUSH-MOUNT SURFACE COMPLETION

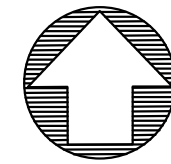
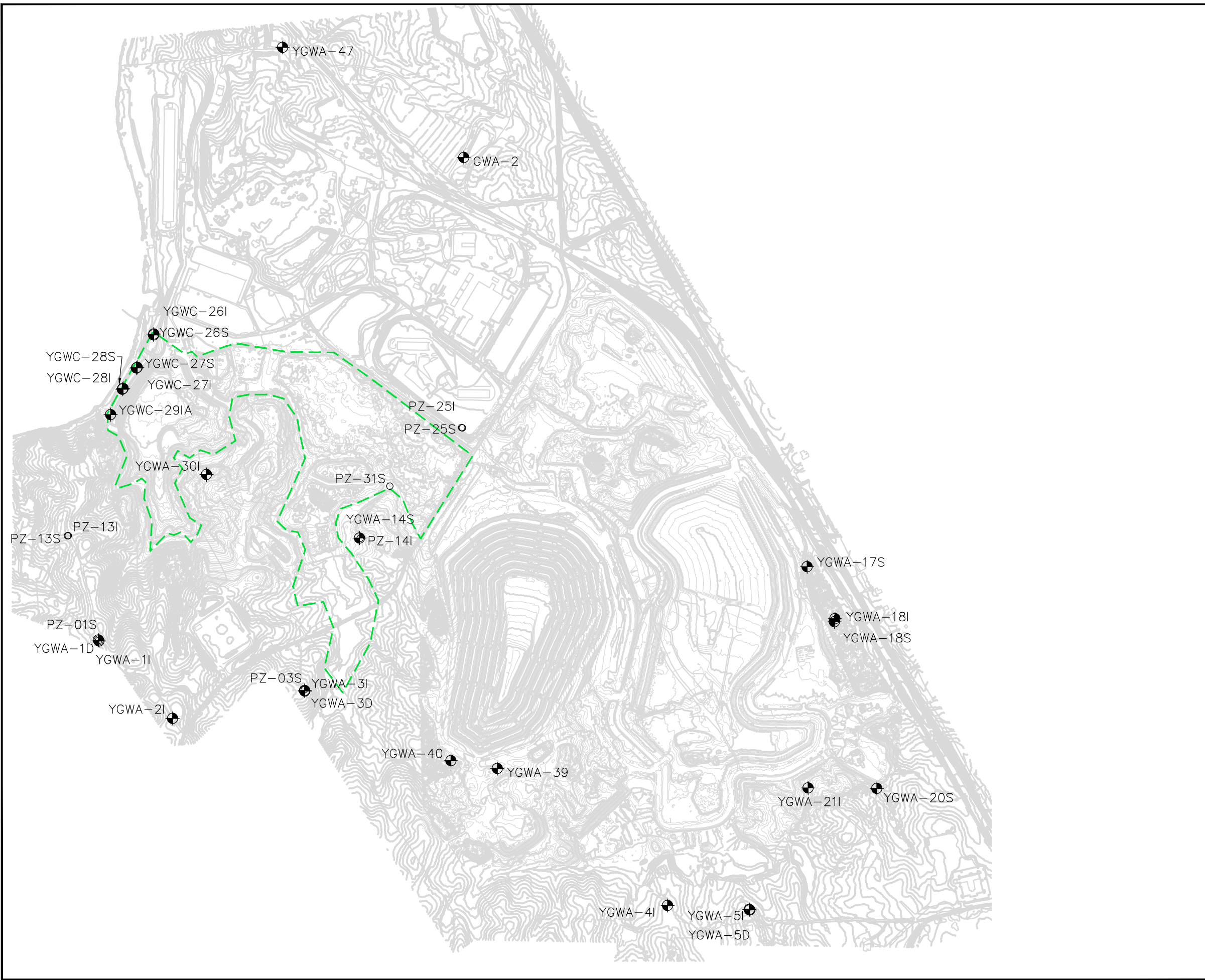
APPENDIX E. GROUNDWATER SAMPLING PROCEDURES

APPENDIX A. MONITORING SYSTEM DETAILS

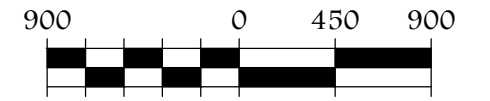
**TABLE A1
MONITORING WELL AND PIEZOMETER NETWORK**

Monitoring Well ID	Hydraulic Location	Total Depth (ft BTOC)	Top of Casing (ft)	Screen Interval Elevation (ft)	Depth to Groundwater (ft BTOC)	February 2022 Groundwater Elevation (ft)	Screened Lithology	Horizontal Hydraulic Conductivity (cm/sec)	Vertical Hydraulic Conductivity (cm/sec)
GWA-2	Upgradient	52.02	805.62	763.8 - 753.8	36.39	769.23	PWR	1.46E-03	n/a
YGWA-1I	Upgradient	53.60	836.60	793.3 - 783.3	37.90	798.70	PWR	1.80E-04	n/a
YGWA-1D	Upgradient	128.85	837.25	759.2 - 709.2	48.94	788.31	Bedrock	6.17E-05	n/a
YGWA-2I	Upgradient	63.75	866.25	812.8 - 802.8	44.92	821.33	PWR	3.53E-06	n/a
YGWA-3I	Upgradient	59.05	796.55	747.7 - 737.7	52.35	744.20	PWR	1.16E-04	n/a
YGWA-3D	Upgradient	134.18	796.78	712.9 - 662.9	30.28	766.50	Bedrock	4.90E-04	n/a
YGWA-4I	Upgradient	48.81	784.21	745.7 - 735.7	22.29	761.92	PWR	8.55E-05	n/a
YGWA-5I	Upgradient	58.94	784.54	735.9 - 725.9	17.96	766.58	PWR	2.90E-04	n/a
YGWA-5D	Upgradient	129.13	784.53	706.0 - 656.0	19.54	764.99	Bedrock	1.11E-04	n/a
YGWA-14S	Upgradient	34.96	748.76	724.1 - 714.1	18.58	730.18	Saprolite	4.94E-04	n/a
YGWA-17S	Upgradient	39.85	783.05	753.2 - 743.2	11.74	771.31	Saprolite	3.46E-04	6.91E-04
YGWA-18S	Upgradient	39.97	790.57	760.9 - 750.9	19.81	770.76	Saprolite	1.06E-04	n/a
YGWA-18I	Upgradient	79.97	790.57	720.9 - 710.9	23.05	767.52	PWR	6.42E-04	n/a
YGWA-20S	Upgradient	29.52	767.12	747.9 - 737.9	11.00	756.12	Saprolite	2.93E-04	9.72E-05
YGWA-21I	Upgradient	79.90	783.70	714.1 - 704.1	30.18	753.52	PWR	2.20E-05	n/a
YGWA-30I	Upgradient	59.48	762.58	713.4 - 703.4	43.98	718.60	PWR	2.27E-03	n/a
YGWA-39	Upgradient	68.59	818.19	760.1 - 750.1	17.62	800.57	PWR	1.85E-03	n/a
YGWA-40	Upgradient	48.23	815.73	778.0 - 768.0	22.71	793.02	PWR	6.50E-04	n/a
YGWA-47	Upgradient	59.19	758.22	709.6 - 699.6	34.83	723.39	PWR	8.04E-04	n/a
YGWC-26S	Downgradient	40.18	716.28	686.4 - 675.4	25.36	690.92	Saprolite	7.76E-05	1.77E-05
YGWC-26I	Downgradient	69.81	715.91	656.4 - 646.4	26.70	689.21	Bedrock	4.27E-04	n/a
YGWC-27S	Downgradient	40.52	716.52	686.3 - 676.3	29.76	686.76	Saprolite	3.02E-03	2.01E-06
YGWC-27I	Downgradient	79.99	716.19	646.5 - 636.5	29.70	686.49	Bedrock	1.80E-04	n/a
YGWC-28S	Downgradient	44.95	717.95	683.3 - 673.3	27.88	690.07	Saprolite	3.17E-04	2.08E-07
YGWC-28I	Downgradient	69.93	717.93	658.3 - 648.3	29.45	688.48	Bedrock	3.35E-05	n/a
YGWC-29IA	Downgradient	34.40	711.80	687.4 - 677.4	n/a	n/a	Bedrock	n/a	n/a
PZ-01S	Water Level Only	36.34	836.84	810.8 - 800.8	32.84	804.00	Saprolite	n/a	n/a
PZ-03S	Water Level Only	42.39	796.39	764.3 - 754.3	36.47	759.92	Saprolite	n/a	n/a
PZ-13S	Water Level Only	43.79	807.79	774.3 - 764.3	36.37	771.42	Saprolite	n/a	n/a
PZ-13I	Water Level Only	59.22	807.62	758.7 - 748.7	40.05	767.57	Bedrock	1.45E-04	n/a
PZ-14I	Water Level Only	50.86	749.06	708.5 - 698.5	19.58	729.48	Bedrock	1.06E-06	n/a
PZ-25S	Water Level Only	56.80	766.60	720.1 - 710.1	43.07	723.53	Saprolite	1.66E-04	1.21E-04
PZ-25I	Water Level Only	84.58	766.38	692.1 - 682.1	46.02	720.36	Bedrock	3.35E-05	n/a
PZ-31S	Water Level Only	34.72	738.62	714.2 - 704.2	26.15	712.47	Saprolite	2.07E-03	7.85E-04

Notes: ft BTOC = feet below top of casing; cm/sec = centimeters per second
Elevations in U.S. Survey Feet (NAVD88) based on June 2020 survey.
PWR = Partially Weathered Rock; n/a = not applicable; TBD = to be determined.



ACC



SCALE (IN FEET)

LEGEND:

EXISTING	DESCRIPTION
	AP-2 BOUNDARY PER D&O PLAN
	YGWC-26S GROUNDWATER MONITORING NETWORK WELL
	PZ-01S PIEZOMETER

- NOTES:
 1. TOPOGRAPHIC GROUND SURFACE PROVIDED BY METRO ENGINEERING & SURVEYING DATED MAY 26, 2017.
 2. ADDITIONAL TOPOGRAPHIC DATA FROM ORTHOGRAPHIC PHOTO DATED JUNE 17, 2021.

PROJECT



GEORGIA POWER COMPANY
 PLANT YATES ASH POND 2

MONITORING WELL NETWORK

PROJECT NO. I054-107

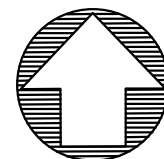
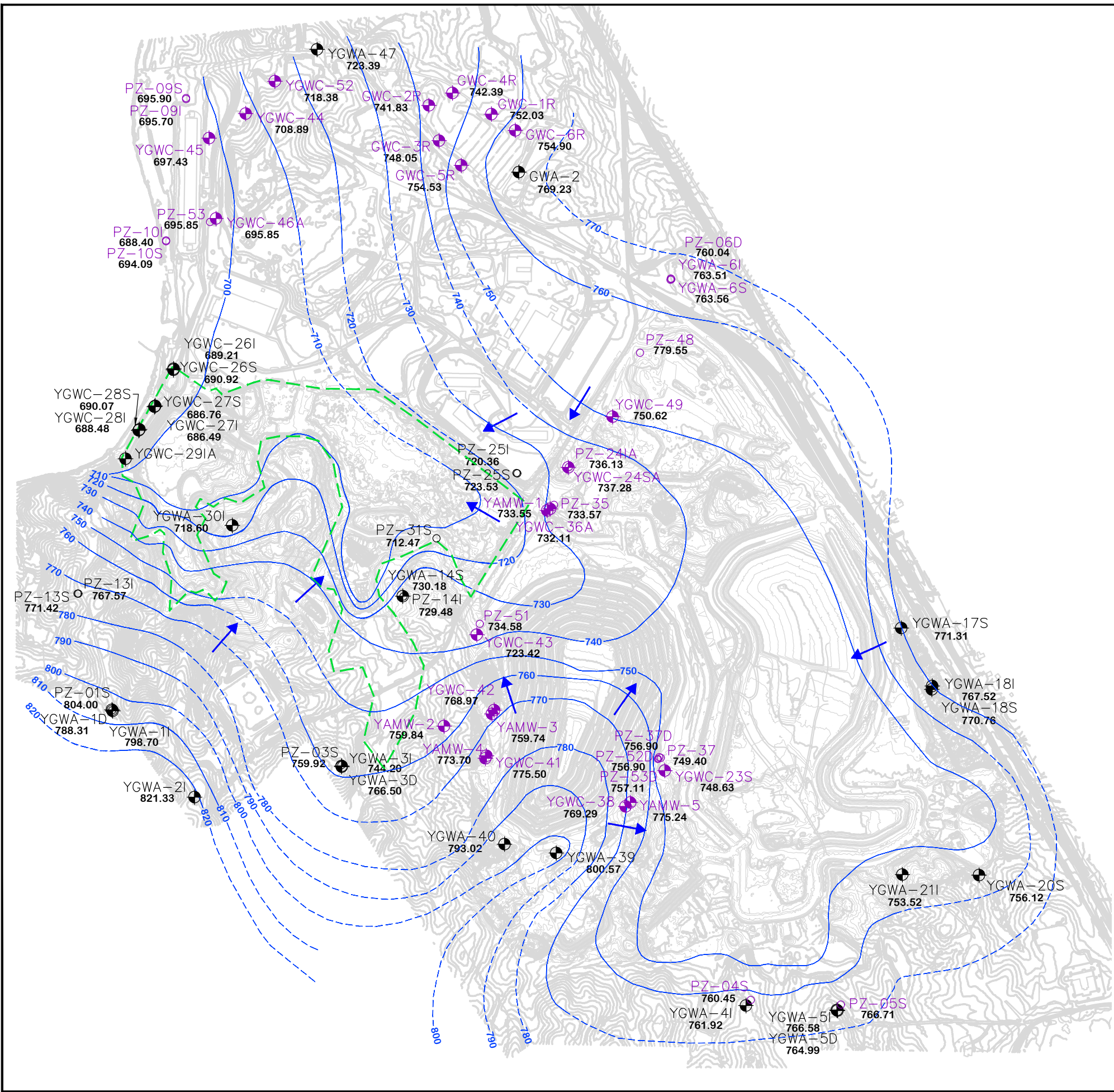
FEBRUARY 2023

DRAWN BY: MM

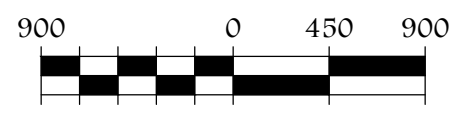
FIGURE:

CHECKED BY: MJ

A1



ACC



SCALE (IN FEET)

LEGEND:

EXISTING	DESCRIPTION
	AP-2 BOUNDARY PER D&O PLAN
	YGWC-26S 690.92 GROUNDWATER MONITORING NETWORK WELL GROUNDWATER ELEVATION
	YGWC-46A 695.85 GROUNDWATER WELL NOT ASSOCIATED WITH AP-2 GROUNDWATER ELEVATION
	PZ-01S 804.00 PIEZOMETER GROUNDWATER ELEVATION
	PZ-48 750.62 PIEZOMETER NOT ASSOCIATED WITH AP-2 GROUNDWATER ELEVATION
	750 — 750 GROUNDWATER ELEVATION CONTOUR (DASHED LINE WHERE INFERRED)
	GROUNDWATER FLOW DIRECTION

- NOTES:
1. TOPOGRAPHIC GROUND SURFACE PROVIDED BY METRO ENGINEERING & SURVEYING DATED MAY 26, 2017.
 2. ADDITIONAL TOPOGRAPHIC DATA FROM ORTHOGRAPHIC PHOTO DATED JUNE 17, 2021.
 3. POTENTIOMETRIC SURFACE CONTOURS, GROUNDWATER ELEVATIONS, AND GROUNDWATER FLOW DIRECTIONS ARE DERIVED FROM FIGURE 4, SITEWIDE GROUNDWATER ELEVATION MAP, FROM THE 2022 SEMIANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT BY ARCADIS, DATED AUGUST 31, 2022.

PROJECT



GEORGIA POWER COMPANY
PLANT YATES ASH POND 2

FEBRUARY 2022 POTENTIOMETRIC SURFACE CONTOUR MAP

PROJECT NO. I054-107 FEBRUARY 2023

DRAWN BY: MM

FIGURE:

CHECKED BY: MJ

A2



APPENDIX B. HYDRAULIC CONDUCTIVITY TESTING RESULTS

**TABLE B1
HORIZONTAL HYDRAULIC CONDUCTIVITY DATA SUMMARY**

Location	Test	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)	Hydraulic Conductivity (ft/yr)
YGWA-1I	Slug-In Test	7.41E-05	0.21	77
	Slug-Out Test	2.86E-04	0.81	296
YGWA-1D	Slug-In Test	1.76E-05	0.05	18
	Slug-Out Test	1.06E-04	0.30	110
YGWA-2I	Slug-In Test	3.53E-06	0.01	4
	Slug-Out Test	N/A	N/A	N/A
YGWA-3I	Slug-In Test	1.34E-04	0.38	139
	Slug-Out Test	9.88E-05	0.28	102
YGWA-3D	Slug-In Test	4.94E-04	1.40	511
	Slug-Out Test	4.87E-04	1.38	504
PZ-13I	Slug-In Test	5.64E-05	0.16	58
	Slug-Out Test	2.33E-04	0.66	241
YGWA-14S	Slug-In Test	3.53E-04	1.00	365
	Slug-Out Test	6.35E-04	1.80	657
PZ-14I	Slug-In Test	1.06E-06	0.003	1
	Slug-Out Test	N/A	N/A	N/A
PZ-25S	Slug-In Test	1.66E-04	0.47	172
	Slug-Out Test	1.66E-04	0.47	172
PZ-25I	Slug-In Test	3.88E-05	0.11	40
	Slug-Out Test	2.82E-05	0.08	29
YGWC-26S	Slug-In Test	8.11E-05	0.23	84
	Slug-Out Test	7.41E-05	0.21	77
YGWC-26I	Slug-In Test	4.48E-04	1.27	464
	Slug-Out Test	4.06E-04	1.15	420
YGWC-27S	Slug-In Test	3.02E-03	8.57	3130
	Slug-Out Test	N/A	N/A	N/A
YGWC-27I	Slug-In Test	1.83E-04	0.52	190
	Slug-Out Test	1.76E-04	0.50	183
YGWC-28S	Slug-In Test	3.53E-04	1.00	365
	Slug-Out Test	2.82E-04	0.80	292
YGWC-28I	Slug-In Test	2.47E-05	0.07	26
	Slug-Out Test	4.23E-05	0.12	44
YGWC-29I	Slug-In Test	4.59E-05	0.13	47
	Slug-Out Test	4.59E-05	0.13	47
YGWA-30I	Slug-In Test	2.13E-03	6.03	2202
	Slug-Out Test	2.40E-03	6.35	2319
PZ-31S	Slug-In Test	1.59E-03	4.51	1642
	Slug-Out Test	2.54E-03	7.21	2624
Slug-in Test Geometric Mean		1.14E-04	0.32	118
Slug-out Test Geometric Mean		2.13E-04	0.60	220

Notes:

1. Slug Test on locations -1 through -14 completed in 2014, -25 through -30 in 2015, -31 and higher performed by ACC, Inc. personnel March 2017.
2. N/A = Result not available.
3. cm/sec = centimeters per second; ft/day = feet per day; ft/yr = feet per year
4. Supporting data are provided in *Hydro* geologic Assessment Report (Part B of the Permit Application).

**TABLE B2
SITEWIDE VERTICAL HYDRAULIC CONDUCTIVITY DATA SUMMARY**

	Depth (ft bgs)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/day)	Hydraulic Conductivity (ft/yr)
YGWA-17S	17 - 19	6.91E-04	1.96	715
YGWC-19S	17 - 19	1.78E-04	0.50	184
YGWA-20S	17 - 19	9.72E-05	0.28	101
YGWC-22S	7 - 9	1.63E-03	4.62	1688
YGWC-22S	17 - 19	4.66E-04	1.32	485
YGWC-24S	17 - 19	2.51E-03	7.11	2599
YGWC-24S	37 - 39	2.50E-05	0.07	26
PZ-25S	33 - 35	4.13E-05	0.12	43
PZ-25S	44 - 46	2.00E-04	0.57	207
YGWC-26S	17 - 19	1.79E-06	0.01	1.9
YGWC-26S	27 - 29	3.36E-05	0.10	35
YGWC-27S	17 - 19	4.58E-07	0.00	0.5
YGWC-27S	27 - 29	3.56E-06	0.01	3.7
YGWC-28S	17 - 19	2.08E-07	0.00	0.2
PZ-30S	27 - 29	1.38E-05	0.04	14
PZ-31S	44 - 46	7.85E-04	2.23	813
Geometric Mean		4.88E-05	0.14	51

Notes:

1. Data from Shelby Tube sample analysis completed by Cardno ATC, 2015.
2. All locations original IDs were originally pre-fixed with "PZ"; pre-fixes of locations incorporated into a groundwater monitoring network were changed to "YGWA" or "YGWC" as appropriate.
3. ft bgs = feet below ground surface
4. cm/sec = centimeters per second; ft/day = feet per day; ft/yr = feet per year

**APPENDIX C. BORING LOGS, WELL CONSTRUCTION DIAGRAMS, EPD
BOND CONTINUATION CERTIFICATES, AND SURVEY
DATA**



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-11
PAGE 1 OF 2
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/8/2014 COMPLETED 5/20/2014 SURF. ELEV. 834.3 COORDINATES: N:1,256,876.13 E:2,070,097.91

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 51.3 ft. GROUND WATER DEPTH: DURING _____ COMP. 33.18 ft. DELAYED _____

NOTES Top of Casing Elevation = 836.6

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete
	Silt (ML) - reddish brown to rusty red, dry, stiff, low plasticity, very fine (silt/clay) with lower fine to upper fine sand grain, cohesive; trace mica; trace organics	831.3	832.3 (2.0)
5	Silty Sand (SM) - reddish brown to red (pink) with zones of light gray mottling, dry, medium dense to loose, no plasticity, lower fine to lower medium grain, noncohesive; trace gravel sized rock fragments; micaceous	828.3	
10	Poorly-graded Sand with Silt (SP-SM) - rusty red with greenish gray mottling, damp, medium dense to dense, no plasticity, lower fine to upper fine grain, slightly cohesive; increasing fines (clay/silt); micaceous; quartz, plagioclase, muscovite, biotite, trace chlorite visible	825.3	
15	Silty Sand (SM) - reddish pink grading to light gray with pinkish to yellowish tan to dark brown mottling, damp, medium dense to loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; trace pea to gravel sized rock fragments; brittle rock fragments		
20	- SM: light gray/tan grading to reddish brown, damp, medium dense to loose, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; zones of increased fines/clay content; completely weathered to residual soil; trace to little mica; quartz, plagioclase, muscovite, biotite visible		Annular Fill: 90/10 Portland Cement/Bentonite Powder
25		808.3	
30	Poorly-graded Sand with Silt (SP-SM) - light brown/tan with rusty red to light gray to dark brown/black mottling, moist, medium dense, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; remnant banding visible; trace mica		
35		799.3	799.3 (35.0)
40	Interlayered/Alternating Biotite Gneiss and Mica Schist - light gray to white (gneiss) with zones of dark gray/black (schist), upper fine to lower coarse grain, medium hard to hard, slightly to not weathered, gneiss banding with zones of schistose foliation, quartz, plagioclase, biotite, muscovite, trace chlorite, pyrite, garnet; low to moderate angled fractures; most fracturing tends to occur in zones of		Annular Seal: 3/8 Hole Plug (medium bentonite chips)
			794.8

(Continued Next Page)

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:27 - \\ALTRCF502X2DB\$MEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-11
PAGE 2 OF 2
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
45		alternating gneiss and schist; no visible healing/fracture fill Interlayered/Alternating Biotite Gneiss and Mica Schist(Con't)	Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (CONTINUED)
50		<p>- Interlayered/Alternating Biotite Gneiss and Mica Schist: light gray to white (gneiss) with zones of dark gray/black (schist), upper fine to lower coarse grain, medium hard to hard, slightly to not weathered, gneiss banding with zones of schistose foliation, quartz, plagioclase, biotite, muscovite, trace chlorite, pyrite, garnet; low to moderate angled fractures; most fracturing tends to occur in zones of alternating gneiss and schist; no visible healing/fracture fill</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Filter: 20/30 Silica Sand</p> <p>Filter: 20/30 Silica Sand</p> <p>Well: 2" OD PVC (SCH 40)</p> <p>Screen: 10 ft; pre-pack</p> </div> <div style="width: 5%; text-align: center;"> <p>ELEV. (DEPTH)</p> </div> <div style="width: 45%;"> <p>(39.5)</p> <p>793.3</p> <p>(41.0)</p> <p>783.3</p> <p>783.0</p> </div> </div>

Bottom of borehole at 51.3 feet.

Sump: 0.30 ft.

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:27 - \\VALTRCF02\X2\DB\SMEL\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-1D
PAGE 1 OF 3
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

DATE STARTED 4/28/2014 COMPLETED 5/20/2014 SURF. ELEV. 834.9 COORDINATES: N:1,256,867.34 E:2,070,104.61

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 126.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 45.89 ft. DELAYED _____

NOTES Top of Casing Elevation = 837.25

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			← Surface Seal: concrete
	Silt (ML) - reddish brown to rusty red, dry, stiff, low plasticity, very fine (silt/clay) with lower fine to upper fine sand grain, cohesive; trace mica; trace organics	831.9	832.9 (2.0)
5	Silty Sand (SM) - reddish brown to red (pink) with zones of light gray mottling, dry, medium dense to loose, no plasticity, lower fine to lower medium grain, noncohesive; trace gravel sized rock fragments; micaceous	828.9	
10	Poorly-graded Sand with Silt (SP-SM) - rusty red with greenish gray mottling, damp, medium dense to dense, no plasticity, lower fine to upper fine grain, slightly cohesive; increasing fines (clay/silt); micaceous; quartz, plagioclase, muscovite, biotite, trace chlorite visible	825.9	
15	Silty Sand (SM) - reddish pink grading to light gray with pinkish to yellowish tan to dark brown mottling, damp, medium dense to loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; trace pea to gravel sized rock fragments; brittle rock fragments		
20	- SM: light gray/tan grading to reddish brown, damp, medium dense to loose, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; zones of increased fines/clay content; completely weathered to residual soil; trace to little mica; quartz, plagioclase, muscovite, biotite visible		
25			
30	Poorly-graded Sand with Silt (SP-SM) - light brown/tan with rusty red to light gray to dark brown/black mottling, moist, medium dense, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; remnant banding visible; trace mica	808.9	
35	Mica Schist with thinly interlayered/alternating Biotite Gneiss - dark gray/black to greenish gray (schist) with thin zones of med gray to light gray (Gneiss), lower fine to upper fine with trace lower medium to upper medium grain, medium hard to soft, slightly to moderately weathered, schistose foliation, trace banding, biotite, chlorite, muscovite, quartz, plagioclase, hornblende, trace garnet, pyrite with some pyrite being porphyroblastic; trace low angle fractures visible; fracturing tends to occur along schistose zones of	800.9	
40			

Annular Fill: 90/10 Portland Cement/Bentonite Powder

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:36 - \\VALTRCF502X2DB\$MEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-1D
PAGE 2 OF 3
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:36 - \\ALTRCF02X2DBSME\\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV. (CONTINUED)	ELEV. (DEPTH)
	<p>phyllosilicate minerals; no healing/fracture fill visible Mica Schist with thinly interlayered/alternating Biotite Gneiss(Con't)</p>		
45			
	<p>Biotite Gneiss - medium gray to light gray, very fine to lower medium grain, medium hard, not to slightly weathered, banded, quartz, plagioclase, muscovite, biotite, hornblende; low angle fractures visible; total to partial healing visible; some zones of orangish brown staining observed</p>	788.4	
50			
55			
60	<p>- Granitic Gneiss: very light gray to white, very fine to upper fine grain, hard to very hard, not weathered, slight/trace banding visible, quartz, plagioclase, muscovite, trace biotite (less mafic minerals than above); low to high angle fracturing observed; unable to distinguish between natural and mechanical fracturing; no visible healing/fracture fill;</p>		
65			
70	<p>- Biotite Gneiss: medium gray to light gray, lower fine to upper medium grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, pyrite, hornblende (increase in mafic minerals); some zones of thinly interlayered (1-2 mm) greenish gray mica schist; low to moderately angled fractures visible; no visible healing/fracture fill; fracturing tends to occur along planes of thinly interlayered schist;</p>		768.4 (66.5)
75			
			<p>Annular Fill: 90/10 Portland Cement/Bentonite Powder</p>
			<p>Annular Seal: 3/8 Hole Plug (medium bentonite chips)</p>
			762.7 (72.2)
			<p>Filter: 20/30 Silica Sand</p>
			759.2 (75.7)
80	<p>Mica Schist with thinly interlayered/alternating Biotite Gneiss - dark gray to greenish gray, lower medium to upper medium with some upper coarse plagioclase /quartz grain, medium hard to soft, not to slightly weathered, schistose foliation, biotite, muscovite, quartz, plagioclase, pyrite; low angle fractures visible; no visible healing/fracture fill; thin zone of highly fractured (rubble zone) biotite gneiss with orangish brown staining @ approx. 88'</p>	755.9	
85			
			<p>Screen: 50 ft; 0.01" slotted</p>

(Continued Next Page)



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-1D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION		WELL DATA
			ELEV.	Surface: protective aluminum cover with bollards; 4-foot square concrete pad
			(CONTINUED)	ELEV. (DEPTH)
90		Mica Schist with thinly interlayered/alternating Biotite Gneiss(Con't)		
95				
100		Biotite Gneiss - medium gray to light gray, upper fine to lower coarse grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, hornblende; pyrite, garnet; @ approx. 109' thin zone with porphyroblastic garnets (2-5 mm in size); low to moderately angled fractures visible; trace to partial healing/some quartz/plagioclase fracture fill; @ approx. 110' thin (1') zone of amphibolite (very mafic, dark gray to black with white flecks, biotite, hornblende, plagioclase, trace quartz, trace pyrite in fractures; no visible texture; upper fine to upper medium grain size; low to high angled fractures; no visible healing/fracture fill, moderately hard to hard, not weathered (fresh))	738.4	
105				
110		Biotite Gneiss: medium gray to light gray, upper fine to lower coarse grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, hornblende; pyrite, trace garnet; low to moderately angled fractures visible; trace to partial healing/some quartz/plagioclase fracture fill; highly fractured (rubble zone) @ approx. 125-126'		
115				
120				
125			708.4	
		Bottom of borehole at 126.5 feet.		709.2 (125.7) 708.9
				Screen: 50 ft; 0.01" slotted Well: 2" OD PVC (SCH 40)
				Sump: 0.30 ft.

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:36 - \\ALTRCF502X2DBSME\\$\GINTE\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

The well coordinates and elevation data were revised based on a June 2020 survey (Arcadis, June 29, 2020).

Note: Top of Casing Elevation = 805.62.

SOUTHERN COMPANY <i>Energy to Serve Your World™</i>		DRILLING LOG				Hole No. GWA-2	
GEOLOGICAL SERVICE						Sheet 1 of 2	
SITE Plant Yates		HOLE DEPTH 49.5		SURF. ELEV. 803.1			
LOCATION Gypsum Stacking Area		COORDINATES N 1,261,383.11		E 2,073,509.98			
ANGLE 0	BEARING 0	CONTRACTOR SCS, Inc.		DRILL NO.			
DRILLING METHOD HAS/SS -31' Rock core-49.5'		NO. SAMPLES 6		NO. U.D. SAMPLES 0			
CASING SIZE 6"		LENGTH		CORE SIZE 2"		TOTAL % REC.	
WATER TABLE DEPTH 37.6		ELEV. 767.71		TIME AFTER COMP. 0		DATE TAKEN 4/17/2007	
TYPE GROUT Portland Type I/II		QUANTITY 18 gallons		MIX 6 gal:94 lbs		DRILLING START DATE 4/16/2007	
DRILLER Shawn Milan		RECORDER Lea Millet		APPROVED		DRILLING COMP. DATE 4/17/2007	

Graphic Log	Depth	Elev.	Material Description, Classification and Remarks	Standard Penetration Test			Sample No.	Comments
				From To	Blows	N		
	0	803.1						
	1	802.1						
	2	801.1						
	3	800.1						
	4	799.1						
	5	798.1	Orange and tan silty CLAY, dry, black mottling, high mica content	4.5-6.0	2/5/6	11		50%
	6	797.1						
	7	796.1						
	8	795.1						
	9	794.1						
	10	793.1	As above	9.5-11.0	4/4/5	9		40%
	11	792.1						
	12	791.1						
	13	790.1						
	14	789.1						
	15	788.1	As above - last 3" starting into saprolite	14.5-16.0	3/5/7	12		50%
	16	787.1						
	17	786.1						
	18	785.1						
	19	784.1						
	20	783.1	Orange gneissic saprolite with mica, dry, weathered feldspar pebbles	19.5-21.0	4/3/8	11		50%
	21	782.1						
	22	781.1						
	23	780.1						
	24	779.1						

SITE **Plant Yates** TOTAL DEPTH **49.5** SURF. ELEV. **805.31**

Graphic Log	Depth	Elev.	Material Description, Classification and Remarks	Standard Penetration Test			Sample No.	Comments
				From To	Blows	N		
	25	778.1	As above, no pebbles	24.5-26.0	4/4/50-3	R		
	26	777.1						
	27	776.1						
	28	775.1						
	29	774.1						
	30	773.1	Granular gneissic saprolite					
	31	772.1	32' - Top of Rock					
	32	771.1	Black & white schist, verging on gneiss - chlorite, biotite, white minerals	32-40 7.9/8				
	33	770.1	Fracture with iron staining, chlorite/biotite schist					
	34	769.1	33.7-Fracture with iron staining Fracture with pyrite	40-45 4.8/5				
	35	768.1	Schist verging on gneiss, iron staining, small amount pyrite					
	36	767.1	Chlorite/biotite schist, iron staining, light clay rind					
	37	766.1	36.9-Iron staining in fracture Fracture with clay rind					
	38	765.1	37.1-Clay rind with minimal pyrite Visible amphibole					
	39	764.1	Pyrite crystal, high chlorite content					
	40	763.1	Abundant pyrite					
	41	762.1	Thin clay rind					
	42	761.1						
	43	760.1	42.7-High chlorite content, heavier clay rind Gneissic with visible biotite books, chlorite, pyrite, thin clay rind					
	44	759.1						
	45	758.1	Chlorite/biotite schist, pyrite, thin clay rind					
	46	757.1	Visible amphibole					
	47	756.1	Gneissic, visible biotite, pyrite					
	48	755.1	Schistic, visible amphibole, clay rind					
	49	754.1	48.1-Heavy clay rind	49.5- Bottom of Boring				
	50	753.1						
	51							
	52							
	53							
	54							
	55							
	56							

The well coordinates and elevation data were revised based on a June 2020 survey (Arcadis, June 29, 2020).

SOUTHERN COMPANY SERVICES, INC.			
WELL CONSTRUCTION LOG		PROJECT	WELL NO.
SITE Plant Yates		Background well installation	GWA-2
LOCATION Gypsum Stacking Area			
DATE STARTED	4/17/2007	ENDED	4/17/2007
		PREPARED	L. Millet
		DEPTH	ELEVATION
	TOP OF CASING		805.62
	GROUND SURFACE	0	803.1
	PROTECTIVE CASING DIA 4" TYPE Sch 40 PVC		
	BOTTOM OF PROTECTIVE CASING	2	801.1
	BACKFILL MATERIAL TYPE Portland Type I/II		
	RISER CASING DIA 2" TYPE Sch 40 PVC		
WATER LEVEL: 37.6	TOP OF SEAL	35.3	767.8
	ANNULAR SEAL TYPE Bentonite		
	TOP OF FILTER PACK	37.3	765.8
	FILTER PACK TYPE: Grade 1A Filter Sand		
	BOTTOM OF RISER/ TOP OF SCREEN	39.3	763.8
	SCREEN DIA 2" TYPE Sch 40 PVC OPENING WIDTH 0.01 OPENING TYPE Slot		
	BOTTOM OF SCREEN	49.3	753.8
	BOTTOM OF CASING	49.3	753.8
	BOTTOM OF HOLE	49.5	753.6
HOLE DIA:	6"		



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-21
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/8/2014 COMPLETED 5/20/2014 SURF. ELEV. 864.0 COORDINATES: N:1,256,144.08 E:2,070,790.49

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 61.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 41.44 ft. DELAYED _____

NOTES Top of Casing Elevation = 866.25

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:18 - \VALTRCF02X2DB\$ME.\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad
			ELEV. (DEPTH)
			861.5
		Sandy Silt (ML) - rusty red, damp, stiff to very stiff, low plasticity, very fine to fine grain, cohesive; trace organics; micaceous	862.0
		Silty Sand (SM) - rusty red to orangish brown, dry, loose, no plasticity, lower fine to upper fine grain, noncohesive; fine gravel sized rock fragments included; micaceous - SM: light brown to tan with some yellowish brown to rusty red mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , completely weathered/residual soil; noncohesive; fine to coarse gravel sized rock fragments included; rock fragments highly weathered and brittle with angular to subangular angularity; micaceous - SM: <i>saprolite</i> , rock fragments increase in size and are less brittle/more competent with depth; angular rock fragment angularity	(2.0)
5			
10			
15			
20			
25			
30			
35			
			829.0
		Partially Weathered Rock - light gray to tan, Pulverized Rock (powder) due to sonic drilling; no describable sample - No Recovery (36' - 40')	
40			824.0

← Surface Seal: concrete

← Annular Fill: 90/10 Portland Cement/Bentonite Powder



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-21
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad
			ELEV. (CONTINUED) ELEV. (DEPTH)
45		<p>Interlayered Biotite Gneiss and Granitic Gneiss</p> <p>- dark gray (Biotite Gneiss) to med gray to light gray (Granitic Gneiss), lower fine to upper fine with zones of lower medium to upper medium grain, medium hard, slightly weathered, slight banding visible, quartz, plagioclase, biotite, muscovite, hornblende, pyrite, garnet visible; very thin 0.5 - 1.0 cm interlayered greenish gray to black schist; visible zones of predominately mafic minerals (Biotite Gneiss) and predominately felsic minerals (Granitic Gneiss); schistose foliation visible in some zones and in areas of mechanical fracture; moderate to high angle fractures visible; total to partial healing with quartz fracture fill</p>	<p>Annular Fill: 90/10 Portland Cement/Bentonite Powder</p> <p style="text-align: right;">818.9 (45.1)</p> <p>← Annular Seal: 3/8 Hole Plug (medium bentonite chips)</p> <p style="text-align: right;">814.3 (49.7)</p> <p>← Filter: 20/30 Silica Sand</p> <p style="text-align: right;">812.8 (51.2)</p> <p style="text-align: center;">Well: 2" OD PVC (SCH 40)</p> <p>← Screen: 10 ft; pre-pack</p> <p style="text-align: right;">802.8</p> <p>← Sump: 0.30 ft.</p> <p style="text-align: right;">802.5</p>
50		<p>- Interlayered Biotite Gneiss/Granitic Gneiss/ Mica Schist: greenish black to greenish gray (Schist) to dark gray to medium gray (Biotite Gneiss) to light gray (Granitic Gneiss), lower fine to lower medium grain, medium hard, quartz, plagioclase, biotite, muscovite, hornblende pyrite, garnet and chlorite visible; faint banding visible within the interlayered zones of Gneiss and a schistose foliation visible in the zones of Mica Schist; decreasing high and moderate angled fracture increasing low angle fractures with apparent rubble zone @ approx. 54'-55'; minimal to no healing visible; hardness ranges from hard to moderately hard (Gneiss) to moderately soft (Schist); slight weathering in zones of softer schist with fresh Gneiss observed</p>	
55			
60			
		Bottom of borehole at 61.5 feet.	

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:18 - \\VALTRCF502X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-31
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 5/7/2014 COMPLETED 5/20/2014 SURF. ELEV. 794.0 COORDINATES: N:1,256,405.20 E:2,072,024.20

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 56.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 46.38 ft. DELAYED _____

NOTES Top of Casing Elevation = 796.55

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
	Lean Clay (CL) - rusty red, moist, medium stiff, medium plasticity, very fine grain, cohesive; micaceous; trace organics		
	Silt (ML) - rusty red, damp, medium dense, low plasticity, very fine to lower fine grain, cohesive; trace clay; micaceous	791.5	792.0 (2.0)
	Silty Sand (SM) - reddish brown to pinkish red with orangish brown mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; micaceous; zone @ approx. 5-5.5' with competent but brittle, gravel to cobble sized angular rock fragments; zone (5-5.5' approx.) is completely weathered but rock fabric is visibly intact - SM: reddish brown to pinkish red with orangish brown to tan to light gray mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; quartz, plagioclase, muscovite identifiable; interbedded coarse gravel to cobble sized rock fragments; rock fragments brittle/frangible to moderately hard; angular to subangular grains	789.0	
	- SM: reddish brown to light brown grading to tan to grayish brown to light gray (change in color alternated from light to dark depending on whether muscovite or biotite in more abundant), damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; zones of remnant rock fabric visible; trace hard rock fragments included; quartz, plagioclase, muscovite, biotite identifiable; micaceous; angular to subangular grains		
	- SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous		
			Annular Fill: 90/10 Portland Cement/Bentonite Powder

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:57 - \\VALTRCF02X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

(Continued Next Page)



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-3I
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:57 - \\ALTRCF502X2DB\$MEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV. (CONTINUED)	ELEV. (DEPTH)
35	<p>Silty Sand (SM)(Cont)</p> <p>- SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i>, noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous</p>		
40		754.0	
45	<p>Granitic Gneiss</p> <p>- light gray, very fine to upper fine grain, medium hard, slightly to moderately weathered, slight banding visible, limited recovery, sample primarily broken into gravel sized chips; quartz, plagioclase, biotite, hornblende, porphyroblastic pyrite; overall, sample is too broken up to identify fracturing, but some low angle fractures with partial quartz fracture fill is visible</p>		752.7 (41.3)
45		749.0	
50	<p>Amphibolite</p> <p>- dark gray to greenish gray to black, lower fine to upper fine grain, hard, not weathered, slight banding visible in some zones with increased biotite, trace zones with a slight schistose foliation, hornblende, biotite, plagioclase, trace quartz, trace pyrite; zone of augen plagioclase with trace quartz; augen zone and fracture fill/pyrite have upper medium to lower coarse grain size; grain size decreases with depth; low to high angle fractures visible</p>		749.0 (45.0)
50		744.0	
55	<p>Biotite Gneiss</p> <p>- medium gray to light gray, lower fine to upper medium grain, hard, not weathered, banded, quartz, plagioclase, biotite, hornblende visible; trace low angle fractures visible; total healing/quartz fracture fill; zone of very coarse grained quartz and plagioclase (Granulite? high grade metamorphic)</p>		747.7 (46.3)
55		737.5	
	Bottom of borehole at 56.5 feet.		737.7
			737.5

Surface:
protective aluminum cover with bollards; 4-foot square concrete pad

Annular Fill: 90/10 Portland Cement/Bentonite Powder

Annular Seal: 3/8 Hole Plug (medium bentonite chips)

Filter: 20/30 Silica Sand

Well: 2" OD PVC (SCH 40)

Screen: 10 ft; pre-pack

Sump: 0.20 ft.



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-3D
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ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 5/6/2014 COMPLETED 5/20/2014 SURF. ELEV. 794.1 COORDINATES: N:1,256,399.94 E:2,072,026.21

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 131.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 28.62 ft. DELAYED _____

NOTES Top of Casing Elevation = 796.78

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
	Lean Clay (CL) - rusty red, moist, medium stiff, medium plasticity, very fine grain, cohesive; micaceous; trace organics		
	Silt (ML) - rusty red, damp, medium dense, low plasticity, very fine to lower fine grain, cohesive; trace clay; micaceous	791.6	792.1 (2.0)
	Silty Sand (SM) - reddish brown to pinkish red with orangish brown mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; micaceous; zone @ approx. 5-5.5' with competent but brittle, gravel to cobble sized angular rock fragments; zone (5-5.5' approx.) is completely weathered but rock fabric is visibly intact - SM: reddish brown to pinkish red with orangish brown to tan to light gray mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; quartz, plagioclase, muscovite identifiable; interbedded coarse gravel to cobble sized rock fragments; rock fragments brittle/frangible to moderately hard; angular to subangular rock fragments	789.1	
	- SM: reddish brown to light brown grading to tan to grayish brown to light gray (change in color alternated from light to dark depending on whether muscovite or biotite in more abundant), damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; zones of remnant rock fabric visible; trace hard rock fragments included; quartz, plagioclase, muscovite, biotite identifiable; micaceous; angular to subangular grains		
	- SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous		
			Annular Fill: 90/10 Portland Cement/Bentonite Powder

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 20:30 - \\VALTRCF02\X2\BDBSMEL\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

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LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-3D
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ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 20:30 - VALTRCF502X2DBSMEL\$GINTPLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV. (CONTINUED)	WELL DATA
				Surface: protective aluminum cover with bollards; 4-foot square concrete pad
35		<p>Silty Sand (SM)(Cont)</p> <p>- SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i>, noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite, identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous</p>		
40		<p>Granitic Gneiss</p> <p>- light gray, very fine to upper fine grain, medium hard, slightly to moderately weathered, slight banding visible, limited recovery, sample primarily broken into gravel sized chips; quartz, plagioclase, biotite, hornblende, porphyroblastic pyrite; overall, sample is too broken up to identify fracturing, but some low angle fractures with partial quartz fracture fill is visible</p>	754.1	
45		<p>Amphibolite</p> <p>- dark gray to greenish gray to black, lower fine to upper fine grain, hard, not weathered, slight banding visible in some zones with increased biotite, trace zones with a slight schistose foliation, hornblende, biotite, plagioclase, trace quartz, trace pyrite; zone of augen plagioclase with trace quartz; augen zone and fracture fill/pyrite have upper medium to lower coarse grain size; grain size decreases with depth; low to high angle fractures visible; fracturing tends to be very thin with moderate to total healing visible; grades to/alternates with Biotite Gneiss towards the bottom of the sample</p>	749.1	
50		<p>Biotite Gneiss</p> <p>- medium gray to light gray, lower fine to upper medium grain, hard, not weathered, banded, quartz, plagioclase, biotite, hornblende visible; trace low angle fractures visible; total healing/quartz fracture fill; zone of very coarse grained quartz and plagioclase (Granulite? high grade metamorphic) @ approx. 56', 30 mm thick plagioclase with a 10mm thick vertical seam of translucent, grayish quartz; quartz vein stops @ the contact with the gneiss above and below the zone</p>	744.1	
55				
60		<p>Amphibolite</p> <p>- dark gray to greenish gray to black, lower fine to upper fine grain, hard, not weathered, slight banding visible in some zones with increased biotite, hornblende, biotite, plagioclase, trace quartz, trace pyrite; low to high angle fractures visible; moderate to total healing visible</p>	735.1	
65		<p>Interlayered/Alternating Biotite Gneiss, Granitic Gneiss and thin (1-2 mm to 4-6 mm) Mica Schist</p> <p>- medium gray to light gray (Gneiss) with dark gray to greenish gray (Schist), upper fine to lower medium grain, hard to medium hard, not to slightly weathered, banded, slight schistose foliation, quartz,</p>	731.1	

Annular Fill: 90/10 Portland Cement/Bentonite Powder

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BORING YGWA-3D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 20:30 - \\VALTRCF02\X2DBSME\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV. (CONTINUED)	WELL DATA
				Surface: protective aluminum cover with bollards; 4-foot square concrete pad
70		<p>plagioclase, biotite, hornblende, muscovite, pyrite visible; low to moderate angled fractures; partial to no visible healing; some visible staining around the interlayered zones of schist</p> <p>Interlayered/Alternating Biotite Gneiss, Granitic Gneiss and thin (1-2 mm to 4-6 mm) Mica Schist (Con't)</p> <p>Granitic Gneiss</p> <p>- light gray, very fine to lower fine grain, hard, not weathered, slight banding (white with thin black bands), quartz, plagioclase, decreased biotite, increased muscovite, trace hornblende, trace pyrite; some muscovite grains are upper medium to lower coarse; high to moderate angled fractures; no visible healing/fracture fill</p>	726.1	Annular Fill: 90/10 Portland Cement/Bentonite Powder
75		<p>Interlayered/Alternating Biotite Gneiss, Granitic Gneiss and thin (1-2 mm to 4-6 mm) Mica Schist</p> <p>- medium gray to light gray (Gneiss) with dark gray to greenish gray (Schist), upper fine to lower medium grain, hard to medium hard, not to slightly weathered, banded, slight schistose foliation, quartz, plagioclase, biotite, hornblende, muscovite, pyrite visible; low to moderate angled fractures; partial to no visible healing</p>	719.1	Annular Seal: 3/8 Hole Plug (medium bentonite chips)
80		<p>Granitic Gneiss</p> <p>- light gray, very fine to lower fine grain, hard, not weathered, slight banding (white with thin black bands), quartz, plagioclase, trace biotite, muscovite, trace hornblende; trace pyrite; some muscovite grains are upper medium to lower coarse; high to moderate angled fractures; no visible healing/fracture fill</p>	710.1	Filter: 20/30 Silica Sand
85		<p>Interlayered/Alternating Amphibolite and Biotite Gneiss</p> <p>- dark gray to black (Amphibolite) with medium gray to light gray (Biotite Gneiss), lower fine to lower coarse grain, hard, not weathered, banded, hornblende, biotite, quartz, plagioclase, muscovite, pyrite; increase in pyrite content and crystal size from above; zones of porphyroblastic plagioclase, occurring along the amphibolite/gneiss contacts; high to moderate fractures visible; quartz fracture fill visible; grain size alternates throughout the sample from fine/medium/coarse</p>	708.1	Screen: 50 ft; 0.01" slotted
90				Well: 2" OD PVC (SCH 40)
95		<p>- Interlayered/Alternating Amphibolite and Biotite Gneiss: dark gray to black (Amphibolite) with medium gray to light gray (Biotite Gneiss), lower fine to lower coarse grain, hard, not weathered, banded, hornblende, biotite, quartz, plagioclase, muscovite, pyrite; increase in pyrite content and crystal size from above; zones of porphyroblastic plagioclase, occurring along the amphibolite/gneiss contacts; high to moderate fractures visible; quartz fracture fill visible</p>		
100				

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LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-3D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 20:30 - VALTRCF502X2DBSME\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad
		ELEV. (CONTINUED) ELEV. (DEPTH)
105	Interlayered/Alternating Amphibolite and Biotite Gneiss(Con't) - Interlayered/Alternating Amphibolite and Biotite Gneiss: dark gray to black (Amphibolite) with medium gray to light gray (Biotite Gneiss), lower fine to lower coarse grain, hard, not weathered, banded, hornblende, biotite, quartz, plagioclase, muscovite, pyrite; increase in pyrite content and crystal size from above; zones of porphyroblastic plagioclase, occurring along the amphibolite/gneiss contacts; high to moderate fractures visible; quartz fracture fill visible	
110		
115		
120	Biotite Gneiss - medium gray to light gray, lower fine to upper medium grain, hard, not to slightly weathered, banded, quartz, plagioclase, biotite, hornblende visible; trace low angle fractures visible; staining visible associated with weathering	Screen: 50 ft; 0.01" slotted
125		
130	- Biotite Gneiss: medium gray to light gray, lower fine to upper medium grain, hard, not to slightly weathered, banded, quartz, plagioclase, biotite, hornblende visible; @ approx. 127' slight mineral dissolution visible along with some staining	
	662.6	662.9
	662.6	662.6

Bottom of borehole at 131.5 feet.

Sump: 0.30 ft.



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-4I
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/10/2014 COMPLETED 5/21/2014 SURF. ELEV. 781.9 COORDINATES: N:1,254,436.58 E:2,075,455.62

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 46.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 17.72 ft. DELAYED _____

NOTES Top of Casing Elevation = 784.21

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:25 - VALTRCF502X2DBSMEL\$GINTPLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		779.4	779.9
	Sandy Silt (ML) - rusty red, damp, medium stiff, low plasticity, very fine grain, cohesive; micaceous; trace organics		(2.0)
	Silty Sand (SM) - reddish brown to light brown, dry, medium dense to loose, no plasticity, lower fine to upper medium grain, some to trace clay decreasing with depth; trace mica; trace organics - SM: medium to light brown to tan, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace mica - SM: light brown to tan grading to reddish brown @ 15', damp, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace mica - SM: reddish brown to tan to white with a greenish tan zone @ approx. 18-20', moist, medium dense, no plasticity, lower fine to upper medium grain, <i>saprolite</i> , visible zones where <i>saprolite</i> has not completely broken down to residual soil and remnant rock fabric visible; zone of more competent <i>saprolite</i> observed; gravel sized rock fragments included; muscovite, biotite, chlorite phyllosilicates visible - SM: orangish brown to light gray to white, moist, medium dense, no plasticity, lower fine to upper medium grain, <i>saprolite</i> , increasing rock fragment size and abundance with depth; rock fragments range from coarse gravel to cobble size; angular fragments		
	Interlayered Granitic Gneiss and Biotite Gneiss - light gray to white with rusty red to orangish brown staining, lower fine to lower medium grain, medium hard, moderately weathered, trace banding, quartz, biotite, muscovite, plagioclase, hornblende; low to moderate angle fractures visible; slight schistose foliation visible in some weathered zones; some zones highly weathered - Interlayered Granitic Gneiss and Biotite Gneiss: light gray to white with zones of dark gray to black, upper fine to lower medium grain, hard, slightly weathered, trace banding, quartz, biotite, muscovite, plagioclase, hornblende, trace garnet; thin zones (1-2 mm to 2-4 mm) of mica schist interlayered with the gneiss; low to moderate angled fractures; total healing observed with quartz fracture fill	751.4	751.3 (30.6)
		747.4	747.4 (34.5)
		745.7	745.7 (36.2)
		735.4	735.7
		735.4	735.4

Bottom of borehole at 46.5 feet.



LOG OF TEST BORING AND WELL INSTALLATION

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/9/2014 COMPLETED 5/21/2014 SURF. ELEV. 782.1 COORDINATES: N:1,254,399.95 E: 2,076,218.86

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 56.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 13.66 ft. DELAYED _____

NOTES Top of Casing Elevation = 784.54

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:41 - \\VALTRCF02X2DBSME\\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad
			ELEV. (DEPTH)
			780.1
			(2.0)
5		<p>Silty Sand (SM) - brown, dry, medium dense, no plasticity, upper fine to lower medium grain, noncohesive; trace organics; angular to sub angular grains - SM: brown, dry, medium dense, no plasticity, upper fine to lower medium grain, slight increase in clay content with depth; cohesive (slight); trace mica; trace coarse grains</p>	777.1
10		<p>Poorly-graded Sand (SP) - light gray to off white, dry, very loose, no plasticity, upper fine to upper medium grain, noncohesive; upper coarse to coarse gravel sized weathered rock fragments; angular to subangular grains; angular rock fragments</p> <p>- SP: med gray to tan to light gray /white with orangish brown to greenish gray mottling, damp, medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i>, noncohesive; completely weathered to residual soil; zones of more competent (completely weathered) rock increasing with depth; trace lenses of silt/clay interbedded within the sand/saprolite; brittle upper coarse to lower gravel sized rock fragments included; micaceous</p>	
15			
20		<p>- SP: light gray/white grading to med gray with orangish brown to dark gray mottling, damp, medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i>, noncohesive; completely weathered to residual soil; angular to subangular grains</p>	
25			
30		<p>- SP: light gray to med gray, damp, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i>, increasing in gravel sized rock fragments (completely weathered, very brittle)</p>	
35			
40		<p>- SP: medium gray to light gray, damp, loose, no plasticity, upper fine to upper coarse grain, <i>saprolite</i>, noncohesive; completely weathered to residual soil with zones of more competent but brittle rock fragments; angular grains; micaceous</p>	742.1
			Annular Fill: 90/10 Portland Cement/Bentonite Powder
			Surface Seal: concrete

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LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-51
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV. (CONTINUED)		WELL DATA	ELEV. (DEPTH)
					Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
45	[Graphic Log]	Partially Weathered Rock - light gray, Pulverized Rock (powder) due to sonic drilling; no describable sample Biotite Gneiss - light brown to light gray to white, upper fine to upper medium grain, medium hard to soft, moderately weathered, banded, quartz, biotite, muscovite, plagioclase, hornblende, trace chlorite; low to moderate angled fractures; no visible healing/fracture fill	741.1	(CONTINUED)		741.8
					← Annular Seal: 3/8 Hole Plug (medium bentonite chips)	(40.3)
					← Filter: 20/30 Silica Sand	737.6 (44.5)
50	[Graphic Log]	- Biotite Gneiss: light gray to medium gray, upper fine to upper medium grain, medium hard to hard, moderately weathered, banded, quartz, biotite, muscovite, plagioclase, hornblende, trace chlorite; increase in mafic minerals; orangish brown staining visible in zones; low to moderate angled fractures visible; no visible healing/fracture fill; slight schistose foliation observed in zones				735.9 (46.2)
					Well: 2" OD PVC (SCH 40)	
					← Screen: 10 ft; pre-pack	
55	[Graphic Log]					725.9
			725.6		← Sump: 0.30 ft.	725.6

Bottom of borehole at 56.5 feet.

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:41 - \\VALTRCF502X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/11/2014 COMPLETED 5/21/2014 SURF. ELEV. 781.9 COORDINATES: N:1,254,396.67 E:2,076,223.63

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 126.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 6.84 ft. DELAYED _____

NOTES Top of Casing Elevation = 784.53

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad
			Surface Seal: concrete
5	Silty Sand (SM) - brown, dry, medium dense, no plasticity, upper fine to lower medium grain, noncohesive; trace organics; angular to sub angular grains - SM: brown, dry, medium dense, no plasticity, upper fine to lower medium grain, slight increase in clay content with depth; cohesive (slight); trace mica; trace coarse grains	779.9	(2.0)
10	Poorly-graded Sand (SP) - light gray to off white, dry, very loose, no plasticity, upper fine to upper medium grain, noncohesive; upper coarse to coarse gravel sized weathered rock fragments; angular to subangular grains; angular rock fragments - SP: med gray to tan to light gray /white with orangish brown to greenish gray mottling, damp, medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; zones of more competent (completely weathered) rock increasing with depth; trace lenses of silt/clay interbedded within the sand/saprolite; brittle upper coarse to lower gravel sized rock fragments included; micaceous - SP: light gray/white grading to med gray with orangish brown to dark gray mottling, damp, medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains - SP: light gray to med gray, damp, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , increasing in gravel sized rock fragments (completely weathered, very brittle) - SP: medium gray to light gray, damp, loose, no plasticity, upper fine to upper coarse grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil with zones of more competent but brittle rock fragments; angular grains; micaceous	776.9	
40		742.1	Annular Fill: 90/10 Portland Cement/Bentonite Powder

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:56 - \\VALTRCF02\X2\B\SMEL\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

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LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV. (CONTINUED)	ELEV. (DEPTH)
45	Biotite Gneiss - light gray to white with light brown to tan staining, lower fine to upper fine grain, medium hard to soft, slightly to moderately weathered, banded, quartz, biotite, plagioclase, muscovite, hornblende, trace chlorite; low angle fracturing visible; 1-2 mm to 6-8 mm thick quartz fracture fill; moderate to partial healing; visible weathering characteristics include staining/discoloration and some mineral decomposition		
50	- Biotite Gneiss: light gray to white with light brown to tan staining, lower fine to upper fine grain, medium hard, moderately weathered, banded, quartz, biotite, plagioclase, muscovite, hornblende, trace chlorite; low to moderate angle fracturing visible; some quartz fracture fill visible; partial to no visible healing		
55			
60	- Interlayered/Alternating Biotite Gneiss and Mica Schist: alternating dark gray and white bands (Gneiss) interlayered with thin (1-2 mm to 5-6 mm) dark gray to greenish gray (Schist), upper fine to lower medium grain, medium hard to hard, not weathered, banded, slight schistose foliation associated with the interlayered mica schist, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite, trace chlorite; primarily low to moderate angled fracturing observed, difficult to distinguish between natural and mechanical fractures; no fracture healing visible; fracturing tends to occur along thinly interlayered zones of schist		
65			
70	- Interlayered/Alternating Biotite Gneiss and Mica Schist: alternating dark gray and white bands (Gneiss) interlayered with thin (1-2 mm to 5-6 mm) dark gray to greenish gray (Schist), upper fine to lower medium grain, medium hard to hard, not weathered, banded, slight schistose foliation associated with the interlayered mica schist, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite, trace chlorite; primarily low to moderate angled fracturing observed; no to partial healing visible; fracturing tends to occur along thinly interlayered zones of schist; @ approx. 66' and 74', 90-120 mm thick zones of white, localized, coarse grained plagioclase feldspar and quartz (Granulite? unclassified metamorphic) with thinly interlayered mica schist; no banding visible in the plagioclase/quartz zone; trace augen plagioclase surrounded by flaky/bladed habit biotite and muscovite, around the zones associated with the coarse grain plagioclase		
75			712.2 (69.7)
80	- Interlayered/Alternating Biotite Gneiss and Mica Schist: alternating dark gray and white bands (Gneiss) interlayered with thin (1-2 mm to 5-6 mm) dark gray to greenish gray (Schist), upper fine to lower medium grain, medium hard to hard, not to slightly weathered, banded, slight schistose foliation associated with the interlayered mica schist, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite, trace chlorite; primarily low to moderate angled fracturing observed; no to partial healing visible; highly fractured (rubble zone) @ approx. 84-86' with some discoloration/staining		
85			707.7 (74.2)
			705.7 (76.2)
			Annular Seal: 3/8 Hole Plug (medium bentonite chips)
			Filter: 20/30 Silica Sand
			Annular Fill: 90/10 Portland Cement/Bentonite Powder
			Screen: 50 ft; 0.01" slotted

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:56 - \\ALTRCF02X2DBSME\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

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LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5D
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:56 - \\ALTRCF02\X2\DBS\ME\G\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	ELEV. (CONTINUED)
90		upper coarse grain, medium hard to hard, not weathered, banded, trace schistose foliation, quartz, plagioclase, biotite, muscovite, hornblende, pyrite; decrease to trace interlayered dark gray to greenish gray mica schist; low to moderate angled fractures, no visible healing/ fracture fill Biotite Gneiss(Cont)		ELEV. (DEPTH)
95				
100		Interlayered/Alternating Unclassified Metamorphic and Biotite Gneiss - white to light gray, lower medium (gneiss) to lower coarse to upper coarse (unclassified metamorphic) grain, hard, not weathered, no banding visible, quartz, plagioclase, biotite, muscovite, hornblende, pyrite; white, coarse grained plagioclase with thin inclusions of porphyroblastic biotite, muscovite crystals in alternating layers; low to moderate angled fractures, no visible healing/ fracture fill; difficult to distinguish between natural and mechanical fractures due to sonic drilling		685.9
105				
110		Biotite Gneiss - alternating light gray and dark gray, lower medium to upper medium with trace lower coarse grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite; @ approx. 114-116', highly fractured (rubble zone -no visible weathering or healing/fracture fill) of greenish gray to dark gray to medium gray alternating schist and gneiss; low angled fractures visible; no visible healing/fracture fill		675.9
115				
120		- Biotite Gneiss: alternating light gray and dark gray, lower medium to upper medium with trace lower coarse grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite; low angled fractures visible; no visible healing/fracture fill		
125		- Biotite Gneiss: alternating light gray and dark gray, lower medium to upper medium with trace lower coarse grain, medium hard to hard, not weathered, banded, quartz, plagioclase, biotite, muscovite, hornblende, trace pyrite; low angled fractures visible; no visible healing/fracture fill		655.4
		Bottom of borehole at 126.5 feet.	← Sump: 0.30 ft.	655.7 655.4

Screen: 50 ft; 0.01" slotted
Well: 2" OD PVC (SCH 40)



LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-14S
PAGE 1 OF 1
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/23/2014 COMPLETED 5/20/2014 SURF. ELEV. 746.8 COORDINATES: N:1,257,828.64 E:2,072,537.

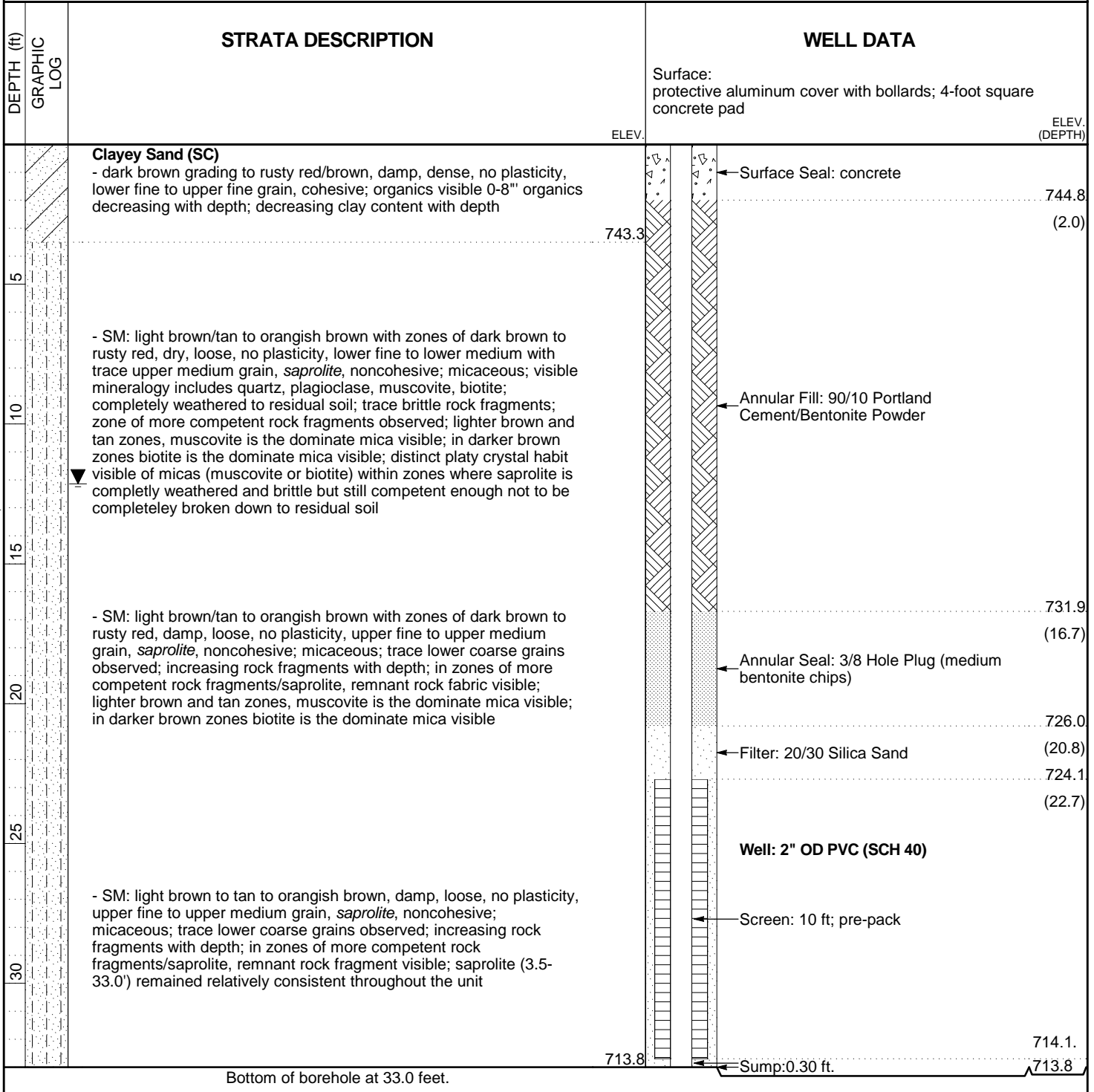
CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 33 ft. GROUND WATER DEPTH: DURING _____ COMP. 12.14 ft. DELAYED _____

NOTES Top of Casing Elevation = 748.76

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:22 - \\ALTRCF02\X2\BBSME\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ





LOG OF TEST BORING

BORING YGWA-17S
PAGE 1 OF 1
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/10/2015 COMPLETED 9/10/2015 SURF. ELEV. 780.2 COORDINATES: N:1,257,602.79 E:2,076,758.31

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING 15 ft. COMP. 20 ft. DELAYED 10.3 ft. after 24 hrs.

NOTES Top of casing elev: 783.05

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:03 - \\ALTRFP01\WSHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Silty Sand (SM) - very pale brown (10YR 7/3) dry, fine to coarse-grained, with mica				Surface Seal: concrete
10		- mottled very pale brown (10YR 7/3) and white (10YR 8/1) - pale brown (10YR 6/3)				Annular Fill: cement-bentonite grout
15		▽ - brownish yellow (10YR 6/8) - light reddish brown (2.5YR 7/3) thin banding				
20		▽ - white (10YR 8/1) wet, massive feldspar and quartz seam - light reddish brown (2.5YR 7/3) - light reddish brown (2.5YR 7/4) wet				Annular Seal: bentonite pellets
25		▼ - mottled pale yellow (2.5Y 8/3) and white / yellowish gray (5Y 8/1)				Filter: silica filter sand
30		- grayish brown (2.5Y 5/2) saprolite - banded pale yellow (2.5Y 7/3) and white / yellowish gray (5Y 8/1)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
35						
40		Bottom of borehole at 37.0 feet.				Sump:0.299999999999997 ft.



LOG OF TEST BORING

BORING YGWA-18S
PAGE 1 OF 1
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/4/2015 COMPLETED 9/8/2015 SURF. ELEV. 787.6 COORDINATES: N:1,257,116.05 E: 2,077,015.25

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING 18 ft. COMP. 19 ft. DELAYED 18.5 ft. after 24 hrs.

NOTES Top of casing elev: 790.57

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:03 - \\ALTRFP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Clayey Sand (SC) - yellowish red (5YR 5/8) dry, no, fine to medium-grained - with mica				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Silty Sand (SM) - mottled reddish yellow (7.5YR 6/8) and very pale brown (10YR 8/4) dry, fine to medium-grained, with mica - mottled pale yellow (2.5Y 7/4) and very pale brown / very pale orange (10YR 8/2) dry				Surface Seal: concrete
15		- moist - saprolite				Annular Fill: cement-bentonite grout
20		▼ - banded light yellowish brown (2.5Y 6/3) and white (N9) moist, fine to coarse-grained ▼ - pale olive (5Y 6/3) very moist, fine to medium-grained - mottled light yellowish brown (2.5Y 6/3) and dark olive brown (2.5Y 3/3) - mottled pale olive (5Y 6/3), dark olive brown (2.5Y 3/3) and white (N9)				Annular Seal: bentonite pellets
25		- wet				Filter: silica filter sand
30		Clayey Silty Sand (SC-SM) - pale olive / dusky yellow (5Y 6/4) saturated, fine to coarse-grained, with mica - mottled olive / moderate olive brown (5Y 4/4) and white (N9) - pale yellow (5Y 8/2)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
35		- banded olive brown (2.5Y 4/4) and white (N9) - regolith - mottled pale yellow (5Y 7/3) and pale yellow (2.5Y 8/2) wet				Sump:0.299999999999997 ft.
40		Bottom of borehole at 37.0 feet.				



LOG OF TEST BORING

BORING YGWA-181
PAGE 1 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/3/2015 COMPLETED 9/8/2015 SURF. ELEV. 787.9 COORDINATES: N:1,257,090.05 E: 2,077,015.82

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 77 ft. GROUND WATER DEPTH: DURING _____ COMP. 19 ft. DELAYED 18.5 ft. after 24 hrs.

NOTES Top of casing elev: 790.57

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:03 - \\ALTRFP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Sand (SC) - olive / light olive brown (5Y 5/6) moist, fine to coarse-grained				Surface Seal: concrete
10		Silty Sand (SM) - mottled strong brown (7.5YR 5/6) and very pale brown / grayish orange (10YR 7/4) dry, fine to coarse-grained, with mica - pale yellow (2.5Y 8/3) dry, some residual quartz gravel - pale yellow (2.5Y 7/3)				
15		- mottled pale yellow (2.5Y 7/3) and yellow (2.5Y 7/6) - mottled light brownish gray (2.5Y 6/2) and light gray (2.5Y 7/1) damp				Annular Fill: cement-bentonite grout
20		Clayey Silty Sand (SC-SM) - mottled pale yellow (2.5Y 7/4) and white / yellowish gray (5Y 8/1) wet, fine to coarse-grained, massive white quartz+feldspar (completely weathered), with mica - mottled pale yellow (2.5Y 7/3) and white (2.5Y 8/1)				
25		- white / yellowish gray (5Y 8/1) fine to coarse-grained, massive white quartz+feldspar (completely weathered), with mica - pale olive (5Y 6/3)				
30		- banded light olive gray (5Y 6/2) and white (2.5Y 8/1) wet, fine to coarse-grained, with mica - banded light yellowish brown (2.5Y 6/3) and white (2.5Y 8/1)				
35		- saprolite				
40		- mottled light gray (2.5Y 7/2) and white (2.5Y 8/1) wet, fine to coarse-grained				

(Continued Next Page)



LOG OF TEST BORING

BORING YGWA-181
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 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:03 - \\VALTR0FP01\W\SHAUGNE\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		Clayey Silty Sand (SC-SM) (Con't) - mottled light gray (2.5Y 7/2) and white / yellowish gray (5Y 8/1) massive quartz+feldspar - mottled dark yellowish brown (10YR 4/6) and very dark gray (10YR 3/1) weathered schist seam - mottled light gray (2.5Y 7/2) and white (2.5Y 8/1)				(CONTINUED) Annular Fill: cement-bentonite grout Annular Seal: bentonite pellets Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump:0.299999999999997 ft.
50		Silty Sand (SM) - brown (10YR 5/3) wet, cohesive, fine to coarse-grained				
55		Granitic gneiss - transition zone, quartz, interbedded with mica schist - pale yellow (2.5Y 7/3) slightly to completely weathered, with gravelly silty sand (weathered zones) - dark yellowish brown (10YR 4/6) and pale yellow (2.5Y 7/3) fine to coarse grain, medium hard, slightly to completely weathered				
60		- yellowish brown (10YR 5/6) and very dark greenish gray (10G 3/1) coarse grain, soft to medium hard, highly weathered, thinly foliated, moderately fractured, fractures sub-horizontal, separates at foliation planes, feldspar, quartz, mica, water stained - dark greenish gray (10BG 4/1) and light bluish gray (5PB 7/1) slightly weathered - yellowish brown (10YR 5/6) and very dark gray (10YR 3/1) highly weathered				
65		- highly weathered, water stained				
70		- grayish brown (10YR 5/2) and black (5Y 2.5/1) coarse grain, moderately weathered, thinly foliated, moderately fractured, fractures sub-horizontal - brownish yellow (10YR 6/8) and white (10R 8/1) - white (10R 8/1) massive feldspar and quartz seam				
75		- grayish brown (10YR 5/2) and white (10R 8/1) massive quartzite seam - thinly foliated - bluish gray (5PB 6/1) and white (10R 8/1) not weathered, fresh competent rock				
80		Bottom of borehole at 77.0 feet.				
85						



LOG OF TEST BORING

BORING YGWA-20S
PAGE 1 OF 1
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/28/2015 COMPLETED 9/29/2015 SURF. ELEV. 764.6 COORDINATES: N:1,255,531.55 E: 2,077,410.37

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 27 ft. GROUND WATER DEPTH: DURING 7 ft. COMP. 6.5 ft. DELAYED 6.5 ft. after 24 hrs.

NOTES Top of casing elev: 767.12

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTRC\FP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Clayey Silty Sand (SC-SM) - dark grayish brown (2.5Y 4/2) wet, fine grained - very pale brown (10YR 7/3) and yellowish brown / moderate yellowish brown (10YR 5/4) fine to coarse-grained, with quartzite gravel - mottled very pale brown (10YR 7/3) and reddish yellow (7.5YR 7/8) moist - moist				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Silty Sand (SM) - mottled light yellowish brown (2.5Y 6/3) and pale yellow (2.5Y 8/3) very moist, fine to coarse grained - dark grayish brown / dark yellowish brown (10YR 4/2) - mottled brownish yellow / dark yellowish orange (10YR 6/6) and white (10YR 8/1)				Surface Seal: concrete Annular Fill: cement-bentonite grout
15						Annular Seal: bentonite pellets Filter: silica filter sand
20		Silty Sand (SM) - mottled brownish yellow / dark yellowish orange (10YR 6/6) and white (10YR 8/1) saprolite wet, fine to coarse-grained - light yellowish brown (2.5Y 6/3), pale yellow (2.5Y 8/2) and white (2.5Y 8/1)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
25		Clayey Silty Sand (SC-SM) - mottled white (2.5Y 8/1) and pinkish white (5YR 8/2) moist, massive weathered feldspar and quartzite				Sump: 0.300000000000001 ft.
Bottom of borehole at 27.0 feet.						
30						
35						
40						



LOG OF TEST BORING

BORING YGWA-211
PAGE 1 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/23/2015 COMPLETED 9/28/2015 SURF. ELEV. 780.8 COORDINATES: N:1,255,538.27 E: 2,076,768.14

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 77 ft. GROUND WATER DEPTH: DURING _____ COMP. 24 ft. DELAYED 24 ft. after 48 hrs.

NOTES Top of casing elev: 783.7

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\WSHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Sand (SC) - mottled strong brown (7.5YR 5/6) and yellowish red / light brown (5YR 5/6) dry, fine to coarse-grained, mica Silty Sand (SM) - reddish yellow (7.5YR 6/8) soil fine to coarse-grained Well-graded Sand (SW) - very pale brown (10YR 7/3) fine to coarse-grained, mica, gravel (residual rock)				Surface Seal: concrete
10		Poorly-graded Sand with Silt (SP-SM) - pale yellow (2.5Y 8/3) and pale yellow (2.5Y 8/2) dry - fine to medium-grained - yellow (2.5Y 7/6)				
15		Silty Sand (SM) - mottled yellow (2.5Y 7/6), white (2.5Y 8/1) and olive brown (2.5Y 4/4) saprolite weathered schist, feldsapr, quartz, fine to coarse-grained				
20		Poorly-graded Sand with Silt (SP-SM) - mottled white (2.5Y 8/1) and yellowish brown / moderate yellowish brown (10YR 5/4) dry, fine to medium-grained - highly decomposed granitic gneiss interbedded with biotite schist - mottled olive brown (2.5Y 4/3) and white (2.5Y 8/1)				Annular Fill: cement-bentonite grout
25		- yellowish brown / moderate yellowish brown (10YR 5/4) - mottled light olive brown (2.5Y 5/4) and pale yellow (2.5Y 8/3) moist, highly decomposed mica scist - mottled white (2.5Y 8/1) and pale brown (10YR 6/3) dry, highly decomposed granitic gneiss, feldspar quartz, mica				
35		Well-graded Sand (SW) - mottled brown (10YR 4/3) and pale yellow (2.5Y 8/2) moist, fine to coarse grained, mica, quartz - Granitic gneiss interbedded with biotite gneiss: mottled light gray (2.5Y 7/2) and white (2.5Y 8/1) - Bedrock transition zone				
40						

(Continued Next Page)



LOG OF TEST BORING

BORING YGWA-211
 PAGE 2 OF 2
 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTR0FP01\W\SHAUGNES\DESKTOP\PIANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		(Cont) - white (2.5Y 8/1) and dark grayish brown (2.5Y 4/2) coarse grain, soft to hard, slightly to moderately weathered, medium to thick foliation, banded, moderately fractured (vertical to sub-vertical)				(CONTINUED) Annular Fill: cement-bentonite grout Annular Seal: bentonite pellets Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump: 0.299999999999997 ft.
50		- white (2.5Y 8/1), dark grayish brown (2.5Y 4/2) and pale yellow (2.5Y 7/3) coarse grain, soft to hard, not to highly weathered, medium to thick foliation, banded, moderately fractured (near vertical), biotite gneiss				
55						
60		- gray (2.5Y 6/1), dark gray (2.5Y 4/1) and white (2.5Y 8/1) coarse grain, not to highly weathered, thin to medium foliation, moderately fractured (vertical to sub-vertical), pyrite, biotite, feldspar, quartz - pale yellow / grayish yellow (5Y 8/4)				
65						
70		- very dark gray (2.5Y 3/1) and white (2.5Y 8/1) coarse grain, not to slightly weathered, thin to medium foliation, moderately fractured (vertical to sub-vertical)				
75						
80		Bottom of borehole at 77.0 feet.				
85						



LOG OF TEST BORING

BORING YGWA-301
PAGE 1 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/22/2015 COMPLETED 9/23/2015 SURF. ELEV. 760.1 COORDINATES: N: 1,258,421.86 E: 2,071,107.11

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 57 ft. GROUND WATER DEPTH: DURING _____ COMP. 34 ft. DELAYED 34 ft. after 48 hrs.

NOTES Top of casing elev: 762.58

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCF01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Clayey Sand (SC) - yellowish red (5YR 5/8) dry, fine to coarse-grained, with mica - mottled yellowish red (5YR 5/8) and strong brown (7.5YR 5/6)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Silty Sand (SM) - light reddish brown (2.5YR 7/3) fine to coarse-grained, with mica - mottled light gray (5Y 7/1) and very dark grayish brown (2.5Y 3/2) dry - light yellowish brown (2.5Y 6/3) fine to coarse-grained, some fine angular gravel (residual rock)				
15		- brownish yellow / dark yellowish orange (10YR 6/6) - light yellowish brown (2.5Y 6/3)				
20		- yellowish brown (10YR 5/6) dry, fine to coarse-grained - olive yellow (2.5Y 6/6)				Annular Fill: cement-bentonite grout
25						
30		Clayey Silty Sand (SC-SM) - dark yellowish brown (10YR 4/6) wet, fine to medium grained - dry				
35		Granitic Gneiss - Bedrock transition zone - light gray (2.5Y 7/2), yellow (2.5Y 7/8) and yellowish red (5YR 5/8) coarse grain, soft to medium hard, moderately to completely weathered, inclined, moderately fractured (sub-vertical and on foliation planes), thin to medium foliation, water stained				
40		- light gray (2.5Y 7/2) and brownish yellow (10YR 6/8) coarse grain, soft to medium hard, moderately to completely weathered, inclined,				

(Continued Next Page)



LOG OF TEST BORING

BORING YGWA-301
 PAGE 2 OF 2
 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTR0FP01\W\SHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		moderately fractured (sub-vertical and on foliation planes), thin to medium foliation, water stained Granitic Gneiss (Cont) - light gray (10YR 7/1), very pale brown (10YR 7/3) and brownish yellow (10YR 6/8) medium to coarse grain, hard, slightly to moderately weathered, inclined, slight to moderately fractured (sub-vertical to horizontal), quartz, feldspar, biotite - yellowish red / light brown (5YR 5/6) moderately to highly weathered, water stained - light gray (10YR 7/1) and brownish yellow (10YR 6/8) medium to coarse grain, hard, not to slightly weathered, inclined, slight to moderately fractured (horizontal), quartz, feldspar, biotite				(CONTINUED) Annular Fill: cement-bentonite grout Annular Seal: bentonite pellets Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump: 0.299999999999997 ft.
50						
55						
Bottom of borehole at 57.0 feet.						
60						
65						
70						
75						
80						
85						

RECORD OF BOREHOLE YGWA-39/PZ-39

SHEET 1 of 2

PROJECT: SCS Plant Yates
 PROJECT NUMBER: 1660300
 DRILLED DEPTH: 66.00 ft
 LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150
 DATE STARTED: 7/6/16
 DATE COMPLETED: 7/7/16

NORTHING: 1,255,717.13
 EASTING: 2,073,865.58
 GS ELEVATION: 815.6
 TOC ELEVATION: 818.19 ft

DEPTH W.L.: 19.15 ft (bgs)
 ELEVATION W.L.: (amsl)
 DATE W.L.: 7/8/2016
 TIME W.L.: N/A

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	815	0.00 - 0.40 topsoil	TOPSOIL		0.40				WELL CASING Interval: 0.0'-55.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 55.5'-65.5' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" Slotted Screen End Cap: Schedule 40 PVC FILTER PACK Interval: 52.5'-66.0' Type: #1 Type Sand FILTER PACK SEAL Interval: 47.5'-52.5' Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'-47.5' Type: Portland Type 1 WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminum DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
		0.40 - 7.00 poorly sorted SAND with SILT, trace gravel, tan, mica fragments, dry, firm	SP-SM		7.00	1		7.00 7.00	
5	810	7.00 - 17.00 some silt, tan, dry, firm			808.6 7.00				
10	805				798.6 17.00				
		17.00 - 19.00 silty SAND, non-plastic fines, orange tan, micaceous, cohesive, firm	SM		796.6 19.00	3		4.00 4.00	
20	795	19.00 - 21.00 poorly graded SAND with SILT, non-plastic fines, moist, firm	SP-SM		794.6 21.00				
		21.00 - 24.00 silty SAND, 15-20% fines, orange tan with iron staining, wet (saprolite)	SM		791.6 24.00	4		6.00 6.00	
25	790	24.00 - 29.00 SAND to silty SAND, some fines, mica, orange tan to tan, severely weathered fragments, dry to moist (saprolite)	SP-SM		786.6 29.00				
30	785	29.00 - 32.00 transitionally weathered rock - sand, some gravel, tan, rock seams, iron staining	PWR		783.6 32.00 782.6	5		3.80 6.00	
		32.00 - 33.00 pulverized GNEISS, tan			782.6 33.00				
35	780	33.00 - 37.00 bedrock - biotite GNEISS, fresh to medium weathered, medium strong to extremely strong, iron stains and deposits	GNEISS		778.6 37.00	6		4.00 4.00	
		37.00 - 39.00 biotite GNEISS, severely weathered, iron staining and deposits			776.6 39.00				
40	775	39.00 - 43.00 biotite GNEISS, severely weathered, sand layers noted iron staining and deposits			772.6 43.00				
		43.00 - 47.00 biotite GNEISS, severely weathered, iron staining and deposits			768.6 47.00	7		7.00 10.00	
50	770	47.00 - 57.00 biotite GNEISS, fresh to slightly weathered, medium strong to extremely strong							

BOREHOLE RECORD, YATES BORING LOGS.GPJ, PIEDMONT.GDT 9/26/17

Log continued on next page

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Tom Ardito

GA INSPECTOR: Courtney Vissman
 CHECKED BY: Rachel Kirkman, PG
 DATE: 9/29/17



RECORD OF BOREHOLE YGWA-39/PZ-39

SHEET 2 of 2

PROJECT: SCS Plant Yates
 PROJECT NUMBER: 1660300
 DRILLED DEPTH: 66.00 ft
 LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150
 DATE STARTED: 7/6/16
 DATE COMPLETED: 7/7/16

NORTHING: 1,255,791.95
 EASTING: 2,073,431.34
 GS ELEVATION: 815.6
 TOC ELEVATION: 818.19 ft

DEPTH W.L.: 19.15 ft (bgs)
 ELEVATION W.L.: (amsl)
 DATE W.L.: 7/8/2016
 TIME W.L.: N/A

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	765	47.00 - 57.00 biotite GNEISS, fresh to slightly weathered, medium strong to extremely strong (<i>Continued</i>)				7		7.00 10.00	<p>Bentonite Pellets</p> <p>0.010" Slotted Screen</p> <p>#1 Type Sand</p> <p>Sump</p>	<p>WELL CASING Interval: 0.0'-55.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 55.5'-65.5' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" Slotted Screen End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 52.5'-66.0' Type: #1 Type Sand</p> <p>FILTER PACK SEAL Interval: 47.5'-52.5' Type: Bentonite Pellets and Chips</p> <p>ANNULUS SEAL Interval: 0.0'-47.5' Type: Portland Type 1</p>
55	760	57.00 - 66.00 biotite GNEISS, fresh to moderately weathered, discoloration, iron stains, medium strong to extremely strong			758.6 57.00			5.00 9.00		
60	755	Boring completed at 66.00 ft								
65	750				749.6					
70	745									
75	740									
80	735									
85	730									
90	725									
95	720									
100										

BOREHOLE RECORD_YATES BORING LOGS.GPJ PIEDMONT.GDT 9/26/17

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Tom Ardito

GA INSPECTOR: Courtney Vissman
 CHECKED BY: Rachel Kirkman, PG
 DATE: 9/29/17



The well coordinates and elevation data were revised based on a June 2020 survey (Arcadis, June 29, 2020).

RECORD OF BOREHOLE YGWA-40/PZ-40


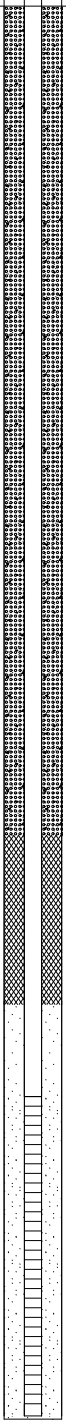

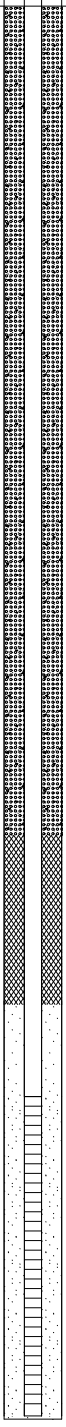

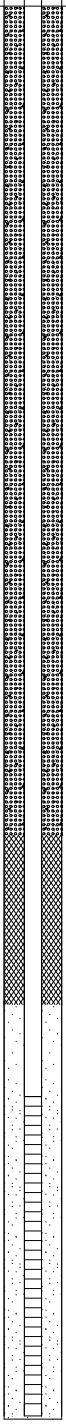
SHEET 1 of 1

PROJECT: SCS Plant Yates
 PROJECT NUMBER: 1660300
 DRILLED DEPTH: 46.00 ft
 LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150
 DATE STARTED: 7/6/16
 DATE COMPLETED: 7/7/16

NORTHING: 1,255,791.95
 EASTING: 2,073,431.34
 GS ELEVATION: 813.5
 TOC ELEVATION: 815.73 ft

DEPTH W.L.: 23.1 ft (bgs)
 ELEVATION W.L.: (amsl)
 DATE W.L.: 7/8/2016
 TIME W.L.: N/A

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES			MONITORING WELL/PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE			REC
0		0.00 - 2.00 sandy SILT, fine to medium sand, reddish brown, low plastic	SM		811.5				WELL CASING Interval: 0.0'-35.5' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 35.5'-45.5' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" Slotted Screen End Cap: Schedule 40 PVC FILTER PACK Interval: 32.5'-46.0' Type: #1 Type Sand FILTER PACK SEAL Interval: 27.0'-32.5' Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'-27.0' Type: Portland Type 1 WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminum DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic	
810		2.00 - 6.00 fine to medium sand, light orange brown, micaceous, dry, loose			2.00	1				6.00 6.00
5		6.00 - 16.00 fine to coarse sand, low plastic silt, some gravel, brown grey to grey, corasening downward, relict laminations, more dense with depth, saprolitic, dry			807.5	2				12.00 10.00
805		16.00 - 17.00 coarse, competent	PWR		797.5					
800		17.00 - 19.00 transitionally weathered rock - highly weathered GNEISS, red, white, dark brown			16.00 796.5	3				3.00 3.00
795		19.00 - 36.00 highly weathered biotite GNEISS, oxidized staining			17.00	4				7.00 7.00
790					794.5	5				10.00 10.00
25					777.5	6				9.00 10.00
785		36.00 - 46.00 bedrock - biotite GNEISS, some weathering, trace pyrite	GNEISS		36.00					
780										
35					767.5					
775		Boring completed at 46.00 ft								
40										
770										
45										
765										
50										

BOREHOLE RECORD - YATES BORING LOGS.GPJ - PIEDMONT.GDT 9/26/17

LOG SCALE: 1 in = 6.5 ft
 DRILLING COMPANY: Cascade Drilling
 DRILLER: Adam M.

GA INSPECTOR: Ben Hodges
 CHECKED BY: Rachel Kirkman, PG
 DATE: 9/29/17



The well coordinates and elevation data were revised based on a June 2020 survey (Arcadis, June 29, 2020).

RECORD OF BOREHOLE PZ-47/YGWA-47

SHEET 1 of 2

PROJECT: SCS Plant Yates
 PROJECT NUMBER: 1660300
 DRILLED DEPTH: 56.50 ft
 LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150
 DATE STARTED: 7/10/16
 DATE COMPLETED: 7/11/16

NORTHING: 1,262,411.84
 EASTING: 2,071,818.05
 GS ELEVATION: 755.6
 TOC ELEVATION: 758.22

DEPTH W.L.: 21.6 ft (bgs)
 ELEVATION W.L.: (amsl)
 DATE W.L.: 7/11/2016
 TIME W.L.: 07:30

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE ft			SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE		
0	755	0.00 - 10.00 no recovery, hydrovac							WELL CASING Interval: 0.0'-46.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 46.1'-56.1' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 43.4'-56.5' Type: #1 Type Sand FILTER PACK SEAL Interval: 33.7'-43.4' Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'-33.7' Type: Portland Type 1 WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminum DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
5	750								
10	745	10.00 - 13.00 silt SAND fining downward to low-plasticity CLAY, red, dry loose	SM-CL		745.6 10.00				
15	740	13.00 - 20.00 sandy SILT, orange to white, loose, dry	ML		742.6 13.00	1	6.00 6.00		
20	735	20.00 - 21.00 highly weathered, mica schist, relict laminations (saprolite) 21.00 - 24.00 orange to white, loose, dry			735.6 20.00 734.6 21.00	2	10.00 10.00		
25	730	24.00 - 26.00 orange to white, relict laminations, loose, dry (saprolite)			731.6 24.00				
		26.00 - 28.00 well sorted sand with some silt, relict laminations, saprolite - schistose 28.00 - 30.00 orange to white, relict laminations, loose, dry			729.6 26.00				
					727.6 28.00	3	3.00 4.00		
					725.6 30.00				
30	725	30.00 - 36.00 transitionally weathered rock, highly weathered mica SCHIST, pulverized from drilling, dry	PWR			4	6.00 6.00		
35	720				719.6 36.00				
40	715	36.00 - 46.00 bedrock - AMPHIBOLITE/SCHIST, deep oxide staining, secondary mineralization	SCHIST			5	3.00 10.00		
45	710				709.6 46.00				
50		46.00 - 56.00 AMPHIBOLITE/SCHIST grading to GNEISS, secondary mineralization, garnet, pyrite inclusions, some quartzite banding				6	7.00 10.00		

Log continued on next page

BOREHOLE RECORD, YATES BORING LOGS.GPJ, PIEDMONT.GDT, 9/26/17

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

GA INSPECTOR: Ben Hodges
 CHECKED BY: Rachel Kirkman, PG
 DATE: 9/29/17



RECORD OF BOREHOLE PZ-47/YGWA-47

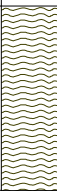
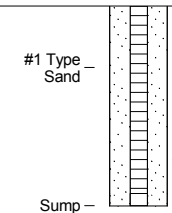
SHEET 2 of 2

PROJECT: SCS Plant Yates
 PROJECT NUMBER: 1660300
 DRILLED DEPTH: 56.50 ft
 LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150
 DATE STARTED: 7/10/16
 DATE COMPLETED: 7/11/16

NORTHING: 1,262,411.84
 EASTING: 2,071,818.05
 GS ELEVATION: 755.6
 TOC ELEVATION: 758.22

DEPTH W.L.: 21.6 ft (bgs)
 ELEVATION W.L.: (amsl)
 DATE W.L.: 7/11/2016
 TIME W.L.: 07:30

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE ft			SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE		
50	705	46.00 - 56.00 AMPHIBOLITE/SCHIST grading to GNEISS, secondary mineralization, garnet, pyrite inclusions, some quartzite banding <i>(Continued)</i>				6			WELL CASING Interval: 0.0'-46.1' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 46.1'-56.1' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 43.4'-56.5' Type: #1 Type Sand FILTER PACK SEAL Interval: 33.7'-43.4' Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'-33.7' Type: Portland Type 1 WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminum DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
55	700				699.6				
60	695	Boring completed at 56.50 ft			56.00				
65	690								
70	685								
75	680								
80	675								
85	670								
90	665								
95	660								
100									

BOREHOLE RECORD, YATES BORING LOGS.GPJ, PIEDMONT.GDT, 9/26/17

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

GA INSPECTOR: Ben Hodges
 CHECKED BY: Rachel Kirkman, PG
 DATE: 9/29/17





LOG OF TEST BORING

BORING YGWC-26S
PAGE 1 OF 1
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/30/2015 COMPLETED 10/1/2015 SURF. ELEV. 713.1 COORDINATES: N: 1,259,734.66 E: 2,070,615.87

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING _____ COMP. 17.2 ft. DELAYED 17.4 ft. after 100 hrs.

NOTES Top of casing elev: 716.28

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		- HYDROEXCAVATION: Hydro-excavate to 10 feet for utility clearance				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Silty Sand (SM) - dark yellowish brown (10YR 4/6) fill damp, with boulders and cobbles, cohesive				Surface Seal: concrete
15		Clayey Sand (SC) - dark reddish brown (5YR 3/3) alluvium very damp, fine-grained				Annular Fill: cement-bentonite grout
15		Fat Clay (CH) - reddish brown (5YR 4/3) alluvium damp, high				
20		Clayey Sand (SC) - reddish brown (5YR 4/3) alluvium damp, fine-grained, with well-rounded medium gravel - wet				Annular Seal: bentonite pellets
25		- mottled brown (7.5YR 4/4) and pale yellow (2.5Y 7/3) wet - mottled brown (7.5YR 5/4) and light brownish gray (2.5Y 6/2) wet				Filter: silica filter sand
30		Clayey Silty Sand (SC-SM) - dark gray (2.5Y 4/1) alluvium cohesive, fine to coarse-grained, well rounded gravel, mica, organics				
35		Clayey Sand (SC) - mottled reddish brown / moderate brown (5YR 4/4) and brown (7.5YR 4/4) alluvium dry, fine to coarse-grained with gravel - yellowish brown / moderate yellowish brown (10YR 5/4) alluvium wet, fine to coarse-grained, some well-rounded fine gravel				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
		Bottom of borehole at 37.0 feet.				Sump: 0.299999999999997 ft.
40						



LOG OF TEST BORING

BORING YGWC-261
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/29/2015 COMPLETED 9/30/2015 SURF. ELEV. 713.1 COORDINATES: N: 1,259,725.79 E: 2,070,613.56

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 67 ft. GROUND WATER DEPTH: DURING 21 ft. COMP. _____ DELAYED 20.8 ft. after 24 hrs.

NOTES Top of casing elev: 715.91

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		- HYDROEXCAVATION: Hydro-excavate to 10 feet for utility clearance				← Surface Seal:
10		Silty Sand (SM) - dark yellowish brown (10YR 4/6) fill damp, with boulders and cobbles, cohesive				
15		Clayey Sand (SC) - dark reddish brown (5YR 3/3) alluvium very damp, fine-grained				
20		Fat Clay (CH) - reddish brown (5YR 4/3) alluvium damp, high				
25		Clayey Sand (SC) - reddish brown (5YR 4/3) alluvium damp, fine-grained, with well-rounded medium gravel - wet				Annular Fill:
30		Clayey Silty Sand (SC-SM) - mottled brown (7.5YR 4/4) and pale yellow (2.5Y 7/3) wet - mottled brown (7.5YR 5/4) and light brownish gray (2.5Y 6/2) wet - dark gray (2.5Y 4/1) alluvium cohesive, fine to coarse-grained, well rounded gravel, mica, organics				
35		Clayey Sand (SC) - mottled reddish brown / moderate brown (5YR 4/4) and brown (7.5YR 4/4) alluvium dry, fine to coarse-grained with gravel - yellowish brown / moderate yellowish brown (10YR 5/4) alluvium wet, fine to coarse-grained, some well-rounded fine gravel				
40		Clayey Silty Sand (SC-SM) - olive (5Y 5/4) alluvium wet, fine to coarse-grained, well-rounded gravel				

(Continued Next Page)



LOG OF TEST BORING

BORING YGWC-261
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SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTR0FP01\W\SHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA	
						(CONTINUED)	
		Clayey Silty Sand (SC-SM) (Con't) - yellowish brown (10YR 5/6) saprolite dry, fine to coarse-grained, with residual gravel (bed-rock)					
45		Granitic gneiss - Bedrock transition zone - light brownish gray / pale yellowish brown (10YR 6/2) medium to coarse grain, very soft to medium hard, moderately to highly weathered - black (2.5Y 2.5/1), dark gray / olive gray (5Y 4/1) and light gray (5Y 7/1) fine to coarse grain, quartzite, feldspar, biotite, amphibolite - reddish yellow (5YR 6/8) and brownish yellow (10YR 6/8) soft to hard, moderately to highly weathered, moderately fractured, near vertical and on foliation planes, water staining				Annular Fill:	
50							
55						Annular Seal: Filter:	
60		- gray (10YR 6/1), light gray (5Y 7/1) and brownish yellow (10YR 6/8) coarse grain, slightly to moderately weathered, banded, slightly to moderately fractured, near vertical and on foliation planes, water staining				Standpipe: Screen: 10 ft;	
65						Sump: 0.299999999999997 ft.	
		Bottom of borehole at 67.0 feet.					
70							
75							
80							
85							



LOG OF TEST BORING

BORING YGWC-27S
PAGE 1 OF 1
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 10/7/2015 COMPLETED 10/7/2015 SURF. ELEV. 713.0 COORDINATES: N: 1,259,417.12 E: 2,070,454.17

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING _____ COMP. 21.1 ft. DELAYED 20.9 ft. after 24 hrs.

NOTES Top of casing elev: 716.52

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\WSHAUGHNESSY\DESKTOP\PIANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Clayey Silty Sand (SC-SM) - dark yellowish brown (10YR 4/4) fill dry, some gravel (angular) - yellowish brown / moderate yellowish brown (10YR 5/4)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		- dark yellowish brown (10YR 4/4) and yellowish brown / moderate yellowish brown (10YR 5/4) - yellowish brown (10YR 5/8) - reddish gray (2.5YR 5/1) fill dry, cohesive - mottled yellowish brown / moderate yellowish brown (10YR 5/4) and yellowish brown (10YR 5/8)				
15		- mottled light yellowish brown (2.5Y 6/4) and reddish yellow (7.5YR 6/8) - black (2.5Y 2.5/1) - mottled light yellowish brown (2.5Y 6/4) and reddish yellow (7.5YR 6/8)				← Surface Seal: concrete ← Annular Fill: cement-bentonite grout
20		Silty Sand (SM) - light olive gray (5Y 6/2) with cobbles				
25		Clayey Sand (SC) - dark grayish brown (2.5Y 4/2) alluvium wet, fine-grained, cohesive, mica - increasing sand content downward - mottled dark yellowish brown (10YR 4/4) and dark yellowish brown (10YR 4/6)				← Annular Seal: bentonite pellets ← Filter: silica filter sand
30		- mottled dark yellowish brown (10YR 4/6) and yellowish brown / moderate yellowish brown (10YR 5/4) - light olive brown (2.5Y 5/3)				← Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
35		Poorly-graded Sand with Silt (SP-SM) - light olive brown (2.5Y 5/3) alluvium saturated, fine-grained				
37		Well-graded Sand with Silt (SW-SM) - yellowish brown (10YR 5/6), light olive gray (5Y 6/2) and reddish yellow (7.5YR 6/8) alluvium wet, fine to coarse-grained, with well-rounded coarse gravel				← Sump: 0.299999999999997 ft.
40		Bottom of borehole at 37.0 feet.				



LOG OF TEST BORING

BORING YGWC-271
PAGE 1 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 10/6/2015 COMPLETED 10/7/2015 SURF. ELEV. 713.2 COORDINATES: N: 1,259,423.73 E: 2,070,460.89

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 77 ft. GROUND WATER DEPTH: DURING _____ COMP. 24.4 ft. DELAYED 24.8 ft. after 24 hrs.

NOTES Top of casing elev: 716.19

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCF01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Silty Sand (SC-SM) - dark yellowish brown (10YR 4/4) fill dry, some gravel (angular) - yellowish brown / moderate yellowish brown (10YR 5/4)				Surface Seal: concrete
10		- dark yellowish brown (10YR 4/4) and yellowish brown / moderate yellowish brown (10YR 5/4) - yellowish brown (10YR 5/8) - reddish gray (2.5YR 5/1) fill dry, cohesive - mottled yellowish brown / moderate yellowish brown (10YR 5/4) and yellowish brown (10YR 5/8) - mottled light yellowish brown (2.5Y 6/4) and reddish yellow (7.5YR 6/8) - black (2.5Y 2.5/1) - mottled light yellowish brown (2.5Y 6/4) and reddish yellow (7.5YR 6/8)				
15		Silty Sand (SM) - light olive gray (5Y 6/2) with cobbles Clayey Sand (SC) - dark grayish brown (2.5Y 4/2) alluvium wet, fine-grained, cohesive, mica - increasing sand content downward - mottled dark yellowish brown (10YR 4/4) and dark yellowish brown (10YR 4/6)				Annular Fill: cement-bentonite grout
25		- mottled dark yellowish brown (10YR 4/6) and yellowish brown / moderate yellowish brown (10YR 5/4) - light olive brown (2.5Y 5/3)				
30		Poorly-graded Sand with Silt (SP-SM) - light olive brown (2.5Y 5/3) alluvium saturated, fine-grained				
35		Well-graded Sand with Silt (SW-SM) - yellowish brown (10YR 5/6), light olive gray (5Y 6/2) and reddish yellow (7.5YR 6/8) alluvium wet, fine to coarse-grained, with well-rounded coarse gravel				
40		Well-graded Sand with Clay (SW-SC) - yellowish brown / moderate yellowish brown (10YR 5/4) alluvium wet, fine to coarse-grained, with well-rounded coarse gravel, cohesive Silty Sand (SM) - light yellowish brown (2.5Y 6/3) saprolite damp, fine to coarse-grained, some angular gravel				
45						

(Continued Next Page)



LOG OF TEST BORING

BORING YGWC-271
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 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
 LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTRFP01\W\SHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
		Fat Clay (CH) - dark greenish gray (5GY 4/1) very moist, high plasticity, with residual rock/gravel Granitic Gneiss - Bedrock transition zone - light gray / yellowish gray (5y 7/2) and olive (5Y 5/4) fine to medium grain, slightly to moderately weathered, inclined, slightly fractured (sub-vertical), water-stained, quartzite, mica, feldspar - black (5YR 2.5/1) - light greenish gray (5GY 7/1) and greenish gray (5GY 6/1) fine to coarse grain, slightly to moderately weathered, inclined, slightly to moderately fractured (sub-vertical), quartzite, mica, feldspar, chlorite - yellowish brown (10YR 5/6) water stained fractures - yellowish brown (10YR 5/6) slightly to moderately weathered, moderately fractured, water-stained fractures - light greenish gray (5GY 7/1) and dark greenish gray (5GY 4/1) fine to coarse grain, not weathered, inclined, moderately fractured, quartzite, mica, feldspar, chlorite				Completion: protective aluminum cover with bollards; 4-foot square concrete pad (CONTINUED) Annular Fill: cement-bentonite grout Annular Seal: bentonite pellets Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump: 0.299999999999997 ft.
50						
55						
60						
65						
70						
75						
Bottom of borehole at 77.0 feet.						
80						
85						
90						
95						



LOG OF TEST BORING

BORING YGWC-28S
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 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
 LOCATION Plant Yates

DATE STARTED 10/5/2015 COMPLETED 10/5/2015 SURF. ELEV. 715.0 COORDINATES: N: 1,259,218.37 E: 2,070,322.23

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 42 ft. GROUND WATER DEPTH: DURING _____ COMP. 16.3 ft. DELAYED 19.7 ft. after 48 hrs.

NOTES Top of casing elev: 717.95

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\WSHAUGHNESSY\DESKTOP\PIANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Silty Sand (SM) - mottled olive (5Y 5/3) and very dark gray (5Y 3/1) fill dry, fine to coarse-grained - brownish yellow / dark yellowish orange (10YR 6/6)				Surface Seal: concrete
10		Clayey Silty Sand (SC-SM) - olive / light olive brown (5Y 5/6) fill fine to coarse-grained, mica - strong brown (7.5YR 5/6) - yellowish brown / moderate yellowish brown (10YR 5/4) - strong brown (7.5YR 5/6)				
15		- mottled olive (5Y 4/3) and very dark gray (5Y 3/1) fill fine to coarse-grained, mica ▼ - mottled olive (5Y 4/3) and very dark gray (10YR 3/1) wet				Annular Fill: cement-bentonite grout
20		Silty Sand (SM) - olive gray / light olive gray (5Y 5/2) alluvium saturated, fine to coarse-grained, mica ▼ - dark grayish brown / dark yellowish brown (10YR 4/2) - very soft to 27 ft.				
25		- strong brown (7.5YR 5/6) and light yellowish brown (2.5Y 6/3) alluvium wet				
30		Clayey Silty Sand (SC-SM)				Annular Seal: bentonite pellets
35		Poorly-graded Sand with Clay (SP-SC) - olive gray / light olive gray (5Y 5/2) wet, fine-grained, mica Medium to High Plastic Organic Clay or Silt (OH) - variegated black (5Y 2.5/1) and weak red / grayish red (10R 4/2) alluvium wet, matted leaves Well-graded Sand with Clay (SW-SC) - mottled black (5Y 2.5/1) and gray / light olive gray (5Y 6/1) alluvium wet, fine to coarse-grained, with fine well-rounded gravel				Filter: silica filter sand
40		Poorly-graded Sand with Clay (SP-SC) - mottled black (5Y 2.5/1) and very dark greenish gray (5GY 3/1) alluvium wet, fine to coarse-grained, mica, organics Clayey Silty Sand (SC-SM)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
45		Bottom of borehole at 42.0 feet.				Sump: 0.299999999999997 ft.



LOG OF TEST BORING

BORING YGWC-281
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ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 10/2/2015 COMPLETED 10/5/2015 SURF. ELEV. 715.0 COORDINATES: N: 1,259,226.47 E: 2,070,328.27

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 67 ft. GROUND WATER DEPTH: DURING 16 ft. COMP. 20.3 ft. DELAYED 21.2 ft. after 48 hrs.

NOTES Top of casing elev: 717.93

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRFP01\WSHAUGHNESSY\DESKTOP\PIANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Silty Sand (SM) - mottled olive (5Y 5/3) and very dark gray (5Y 3/1) fill dry, fine to coarse-grained - brownish yellow / dark yellowish orange (10YR 6/6)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Clayey Silty Sand (SC-SM) - olive / light olive brown (5Y 5/6) fill fine to coarse-grained, mica - strong brown (7.5YR 5/6) - yellowish brown / moderate yellowish brown (10YR 5/4) - strong brown (7.5YR 5/6) - mottled olive (5Y 4/3) and very dark gray (5Y 3/1) fill fine to coarse-grained, mica				
15		Silty Sand (SM) - mottled olive (5Y 4/3) and very dark gray (5Y 3/1) fill fine to coarse-grained, mica - mottled olive (5Y 4/3) and very dark gray (10YR 3/1) wet				Annular Fill: cement-bentonite grout
20		Silty Sand (SM) - olive gray / light olive gray (5Y 5/2) alluvium saturated, fine to coarse-grained, mica - dark grayish brown / dark yellowish brown (10YR 4/2) - very soft to 27 ft.				
25		Clayey Silty Sand (SC-SM) - strong brown (7.5YR 5/6) and light yellowish brown (2.5Y 6/3) alluvium wet				
30		Poorly-graded Sand with Clay (SP-SC) - olive gray / light olive gray (5Y 5/2) wet, fine-grained, mica				
35		Medium to High Plastic Organic Clay or Silt (OH) - variegated black (5Y 2.5/1) and weak red / grayish red (10R 4/2) alluvium wet, matted leaves				
35		Well-graded Sand with Clay (SW-SC) - mottled black (5Y 2.5/1) and gray / light olive gray (5Y 6/1) alluvium wet, fine to coarse-grained, with fine well-rounded gravel				
40		Poorly-graded Sand with Clay (SP-SC) - mottled black (5Y 2.5/1) and very dark greenish gray (5GY 3/1)				

(Continued Next Page)



LOG OF TEST BORING

BORING YGWC-281
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 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTR0FP01\W\SHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		alluvium wet, fine to coarse-grained, mica, organics Clayey Silty Sand (SC-SM) (Con't) - mottled dark greenish gray (5GY 4/1) and olive brown (2.5Y 4/4) alluvium wet, fine to coarse-grained, mica - yellowish brown (10YR 5/6)				(CONTINUED)
50		Biotite Gneiss - Benrock transition zone - gray (2.5Y 6/1), greenish gray (10GY 6/1) and dark gray (2.5Y 4/1) fine to coarse grain, hard, not to slightly weathered, inclined, slightly to moderately fractured (sub-vertical and at foliation planes), quartzite, garnet, pyrite				Annular Fill: cement-bentonite grout
55						Annular Seal: bentonite pellets
60		- gray (2.5Y 6/1), dark gray (2.5Y 4/1) and brownish yellow (10YR 6/8) fine to coarse grain, hard, not to slightly weathered, inclined, slightly fractured (on foliation planes), water-stained fractures, quartzite, garnet, pyrite, chlorite				Filter: silica filter sand
65		- dark gray (2.5Y 4/1), greenish black (10G 2.5/1) and greenish gray (10BG 6/1) fine to medium grain, hard to very hard, not weathered, micro-folds				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
Bottom of borehole at 67.0 feet.						Sump:0.299999999999997 ft.
70						
75						
80						
85						

RECORD OF BOREHOLE YGWC-29IA





SHEET 1 of 1

PROJECT: Georgia Power Plant Yates
 PROJECT NUMBER: 30143622
 DRILLED DEPTH: 32.5 ft
 LOCATION: Newnan, GA

DRILL RIG: TerraSonic 150CC
 DATE STARTED: 1/9/2023
 DATE COMPLETED: 1/10/2023

NORTHING: 1258981.85
 EASTING: 2070212.16
 GS ELEVATION: 709.00
 TOC ELEVATION: 711.80

DEPTH W.L.: 22.15
 ELEVATION W.L.: 689.65
 DATE W.L.: 1/27/2023
 TIME W.L.: 12:30:00 PM

DEPTH (ft)	DESCRIPTION	USCS	GRAPHIC LOG	DEPTH (ft)	SAMPLE NO.	PHOTO	REC	TGWC-29IA MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0.0 - 16.0	(SM) Silty SAND; 5Y 7/3; loose; fine grained; well sorted; slightly moist; trace gravel; FILL. Grading to 5Y 4/2. Grading to 10YR 5/4. Grading to 10YR 3/3. Grading to 2.5YR 6/3.	SM		0.0	1		6.0 6.0	2-inch diameter PVC Riser Aquaguard Bentonite Grout	WELL CASING Interval: -2.9'-21.6' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded WELL SCREEN Interval: 21.6'-31.6' Material: U-Pack Schedule 40 PVC Diameter: 2" Slot Size: 0.010" FILTER PACK Interval: 19.1'-32.5' Type: Southern Products and Silica GP#1 Quantity: 2 cf FILTER PACK SEAL Interval: 14.9'-19.1' Type: 3/8" Pel-Plug Bentonite Pellets Quantity: 0.6 cf ANNULUS SEAL Interval: 0.5'-14.9' Type: Aquaguard Bentonite Grout Quantity: 3.2 cf
16.0 - 32.5	Biotite Schist; interbedded with biotite gneiss; thinly laminated; moderately weathered; GLEY2 2.5/10B. Grading to biotite gneiss; GLEY1 4/N. Grading to GLEY1 5/10Y; biotite gneiss and biotite schist interbedded. Highly weathered material from 22 to 24 ft bls; rig responded as if void space. Grading to moderately weathered interbedded biotite gneiss and biotite schist; GLEY1 4/10GY. Grading slightly weathered.	BED-ROCK		16.0	3		4.0 4.0	3/8" Pel-Plug Bentonite Pellets	SURFACE COMPLETION Protection: 4"x4" Aluminum Pad: 4"x4' Concrete Lock: Yes Date: 1/10/2023
32.5	Boring terminated.			32.5				GP#1 (16-50) Silica Sand U-Pack Screen, slotted (0.010-inch)	

DRILLING COMPANY: Cascade Drilling
 DRILLER: Cory Franklin

CHECKED BY: David Prouty
 DATE: 2/21/2023





LOG OF TEST BORING AND WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/8/2014 COMPLETED 5/20/2014 SURF. ELEV. 834.5 COORDINATES: N:1,256,871.97 E:2,070,101.24

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 34 ft. GROUND WATER DEPTH: DURING _____ COMP. 28.55 ft. DELAYED _____

NOTES Top of Casing Elevation = 836.84

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 12:14 - \\VALTRCF02\X2\DB\SMEL\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			832.5 (2.0)
	Silt (ML) - reddish brown to rusty red, dry, stiff, low plasticity, very fine (silt/clay) with lower fine to upper fine sand grain, cohesive; trace mica; trace organics		
			831.5
	Silty Sand (SM) - reddish brown to red (pink) with zones of light gray mottling, dry, medium dense to loose, no plasticity, lower fine to lower medium grain, noncohesive; trace gravel sized rock fragments; micaceous		
			828.5
	Poorly-graded Sand with Silt (SP-SM) - rusty red with greenish gray mottling, damp, medium dense to dense, no plasticity, lower fine to upper fine grain, slightly cohesive; increasing fines (clay/silt); micaceous; quartz, plagioclase, muscovite, biotite, trace chlorite visible		
			825.5
	Silty Sand (SM) - reddish pink grading to light gray with pinkish to yellowish tan to dark brown mottling, damp, medium dense to loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; trace pea to gravel sized rock fragments; brittle rock fragments		
			816.5 (18.0)
	Silty Sand (SM) - SM: light gray/tan grading to reddish brown, damp, medium dense to loose, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; zones of increased fines/clay content; completely weathered to residual soil; trace to little mica; quartz, plagioclase, muscovite, biotite visible		
			812.8 (21.7)
			810.8 (23.7)
			808.5
	Poorly-graded Sand with Silt (SP-SM) - light brown/tan with rusty red to light gray to dark brown/black mottling, moist, medium dense, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , slightly cohesive; remnant banding visible; trace mica		
			800.5
			800.8
			800.5

Bottom of borehole at 34.0 feet.

Sump: 0.30 ft.

Well: 2" OD PVC (SCH 40)

Screen: 10 ft; pre-pack

Annular Fill: 90/10 Portland Cement/Bentonite Powder

Annular Seal: 3/8 Hole Plug (medium bentonite chips)

Filter: 20/30 Silica Sand

Surface Seal: concrete



LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-3S
PAGE 1 OF 1
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 5/7/2014 COMPLETED 5/20/2014 SURF. ELEV. 794.0 COORDINATES: N:1,256,410.86 E:2,072,021.63

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 40 ft. GROUND WATER DEPTH: DURING _____ COMP. 32.2 ft. DELAYED _____

NOTES Top of Casing Elevation = 796.39

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
	Lean Clay (CL) - rusty red, moist, medium stiff, medium plasticity, very fine grain, cohesive; micaceous; trace organics	791.5	792.0
	Silt (ML) - rusty red, damp, medium dense, low plasticity, very fine to lower fine grain, cohesive; trace clay; micaceous	789.0	(2.0)
	Silty Sand (SM) - reddish brown to pinkish red with orangish brown mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; micaceous; zone @ approx. 5-5.5' with competent but brittle, gravel to cobble sized angular rock fragments; zone (5-5.5' approx.) is completely weathered but rock fabric is visibly intact - SM: reddish brown to pinkish red with orangish brown to tan to light gray mottling, dry, loose, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; angular to subangular grains; quartz, plagioclase, muscovite identifiable; interbedded coarse gravel to cobble sized rock fragments; rock fragments brittle/friable to moderately hard; angular to subangular grains - SM: reddish brown to light brown grading to tan to grayish brown to light gray (change in color alternated from light to dark depending on whether muscovite or biotite in more abundant), damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; zones of remnant rock fabric visible; trace hard rock fragments included; quartz, plagioclase, muscovite, biotite identifiable; micaceous; angular to subangular grains - SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous - SM: light brown to light gray/white with orangish brown and dark brown mottling, damp, loose with zones of medium dense, no plasticity, upper fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; quartz, plagioclase, muscovite, biotite identifiable; trace brittle, gravel sized rock fragments included; angular grains; micaceous		
			Surface Seal: concrete
			Annular Fill: 90/10 Portland Cement/Bentonite Powder
			Annular Seal: 3/8 Hole Plug (medium bentonite chips)
			Filter: 20/30 Silica Sand
			Well: 2" OD PVC (SCH 40)
			Screen: 10 ft; pre-pack
			Sump: 0.30 ft.
		754.0	754.0
	Bottom of borehole at 40.0 feet.		

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:40 - \\VALTRCF02X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-13S
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ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/24/2014 COMPLETED 5/20/2014 SURF. ELEV. 805.5 COORDINATES: N:1,257,849.98 E:2,069,810.25

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 41.5 ft. GROUND WATER DEPTH: DURING _____ COMP. 33.56 ft. DELAYED _____

NOTES Top of Casing Elevation = 807.79

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
	Clayey Sand (SC) - rusty red, damp, dense, low plasticity, very fine to upper fine grain, cohesive; trace organics near surface decreasing with depth; micaceous		
			← Surface Seal: concrete
		803.5	(2.0)
		801.5	
	Silty Sand (SM) - rusty red to dark brown, dry, loose, no plasticity, lower fine to upper fine grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; micaceous; quartz, plagioclase, muscovite, biotite visible; gravel sized, brittle/friable rock fragments grading to cobble sized, harder/more competent rock fragments with depth		
5			
10	- SM: dark brown to light brown/orangish brown to light gray/white, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered but has not completely broken down to soil; sample very micaceous/abundant phyllosilicates; muscovite, biotite, chlorite; color/lithology grades/alternates depending on the abundant mica present		
15			Annular Fill: 90/10 Portland Cement/Bentonite Powder
20	- SM: dark brown to light brown/orangish brown to light gray/white, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered but has not completely broken down to soil; sample very micaceous/abundant phyllosilicates; muscovite, biotite, chlorite; color/lithology grades/alternates		

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:28 - \\VALTRCF502X2DB\$MEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



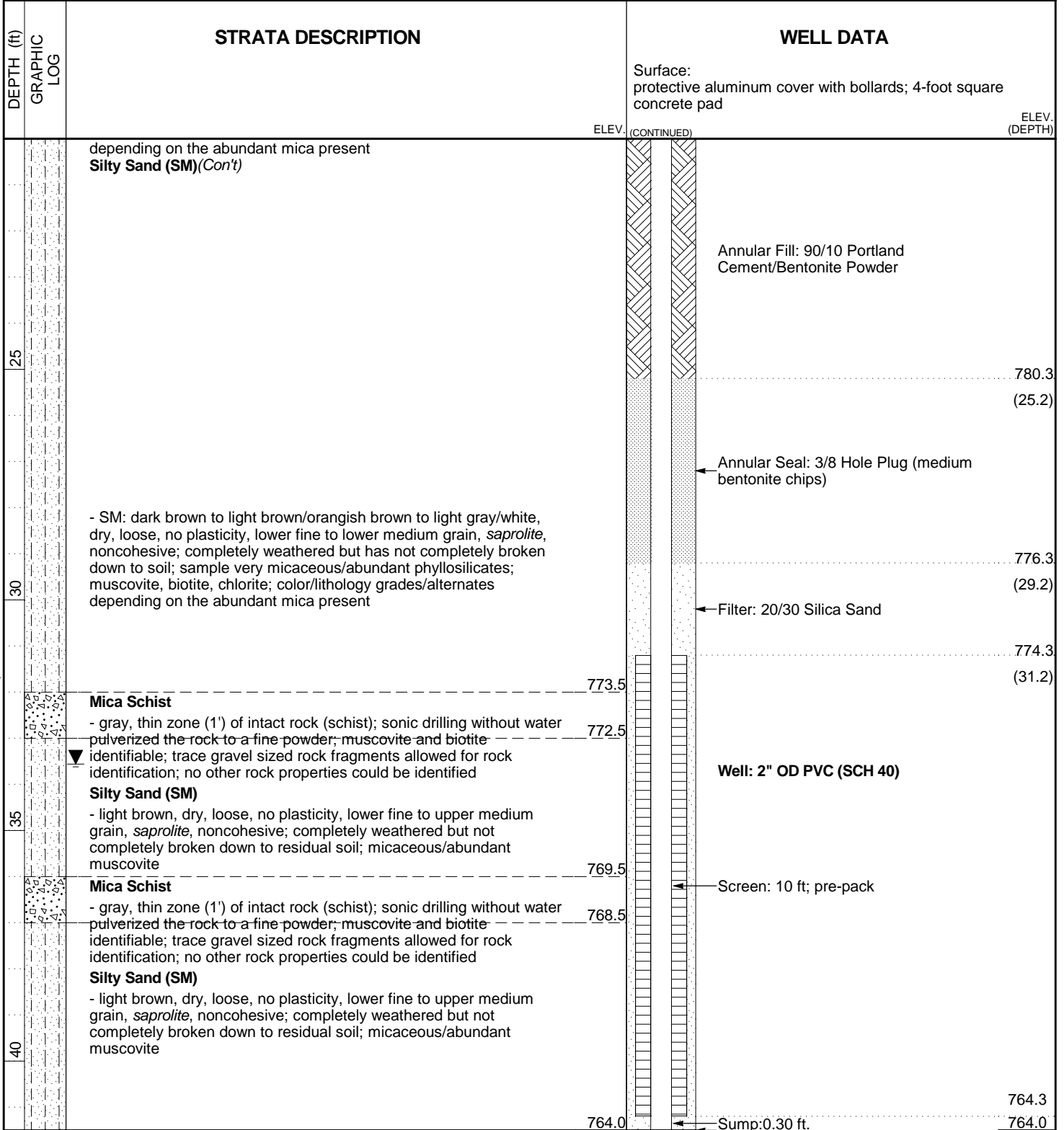
LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-13S
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ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:28 - \\ALTRCF502X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



Bottom of borehole at 41.5 feet.



LOG OF TEST BORING AND WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/24/2014 COMPLETED 5/20/2014 SURF. ELEV. 805.4 COORDINATES: N:1,257,850.30 E:2,069,817.10

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 57 ft. GROUND WATER DEPTH: DURING _____ COMP. 36.23 ft. DELAYED _____

NOTES Top of Casing Elevation = 807.62

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:34 - \\VALTRCF502X2DB\$MEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	WELL DATA	ELEV. (DEPTH)
				Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		Clayey Sand (SC) - rusty red, damp, dense, low plasticity, very fine to upper fine grain, cohesive; trace organics near surface decreasing with depth; micaceous			
			803.4	← Surface Seal: concrete	(2.0)
		Silty Sand (SM) - rusty red to dark brown, dry, loose, no plasticity, lower fine to upper fine grain, <i>saprolite</i> , noncohesive; completely weathered to residual soil; micaceous; quartz, plagioclase, muscovite, biotite visible; gravel sized, brittle/friable rock fragments grading to cobble sized, harder/more competent rock fragments with depth	801.4		
5					
10		- SM: dark brown to light brown/orangish brown to light gray/white, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered but has not completely broken down to soil; sample very micaceous/abundant phyllosilicates; muscovite, biotite, chlorite; color/lithology grades/alternates depending on the abundant mica present			
15					
20		- SM: dark brown to light brown/orangish brown to light gray/white, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered but has not completely broken down to soil; sample very micaceous/abundant phyllosilicates; muscovite, biotite, chlorite; color/lithology grades/alternates			
				Annular Fill: 90/10 Portland Cement/Bentonite Powder	

(Continued Next Page)



LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-131
PAGE 2 OF 3
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:34 - \\VALTRCF502X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad
		depending on the abundant mica present Silty Sand (SM)(Cont)	ELEV. (CONTINUED) ELEV. (DEPTH)
25			
30		- SM: dark brown to light brown/orangish brown to light gray/white, dry, loose, no plasticity, lower fine to lower medium grain, <i>saprolite</i> , noncohesive; completely weathered but has not completely broken down to soil; sample very micaceous/abundant phyllosilicates; muscovite, biotite, chlorite; color/lithology grades/alternates depending on the abundant mica present	
			Annular Fill: 90/10 Portland Cement/Bentonite Powder
		Mica Schist - gray, thin zone (1') of intact rock (schist); sonic drilling without water pulverized the rock to a fine powder; muscovite and biotite identifiable; trace gravel sized rock fragments allowed for rock identification; no other rock properties could be identified	773.4
		Silty Sand (SM) - light brown, dry, loose, no plasticity, lower fine to upper medium grain, <i>saprolite</i> , noncohesive; completely weathered but not completely broken down to residual soil; micaceous/abundant muscovite	772.4
		Mica Schist - gray, thin zone (1') of intact rock (schist); sonic drilling without water pulverized the rock to a fine powder; muscovite and biotite identifiable; trace gravel sized rock fragments allowed for rock identification; no other rock properties could be identified	769.4
		Silty Sand (SM) - light brown, dry, loose, no plasticity, lower fine to upper medium grain, <i>saprolite</i> , noncohesive; completely weathered but not completely broken down to residual soil; micaceous/abundant muscovite	768.4
		Mica Schist - dark gray, lower medium to upper medium grain, soft, slightly to not weathered; schistose foliation, muscovite, biotite, quartz, large porphyroblastic garnets; low angle fractures visible; no healing visible	764.4
		Biotite Gneiss - medium gray to light gray/white, upper fine to upper medium grain, medium hard to hard, not weathered, banding visible with trace layers	763.4
			763.9 (41.5)
			Annular Seal: 3/8 Hole Plug (medium bentonite chips)

(Continued Next Page)



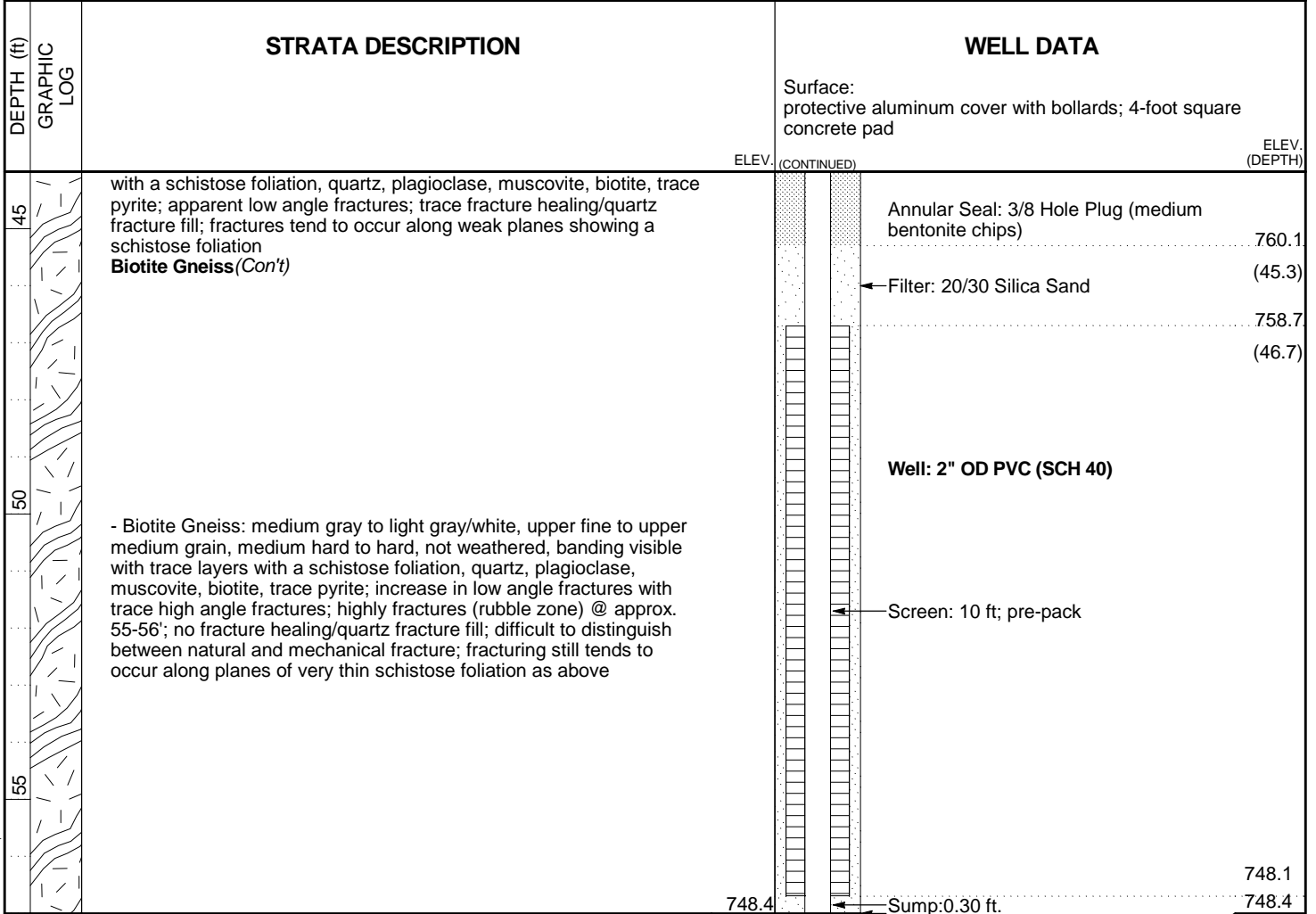
LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-131
PAGE 3 OF 3
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA



Bottom of borehole at 57.0 feet.

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:34 - \\VALTRCF02\X2\DBS\MEL\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



LOG OF TEST BORING AND WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

DATE STARTED 4/23/2014 COMPLETED 5/20/2014 SURF. ELEV. 747.2 COORDINATES: N:1,257,826.16 E:2,072,542.59

CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic

DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 49 ft. GROUND WATER DEPTH: DURING _____ COMP. 12.74 ft. DELAYED _____

NOTES Top of Casing Elevation = 749.06

DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION	WELL DATA	
		ELEV.	ELEV. (DEPTH)
		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
	Clayey Sand (SC) - dark brown grading to rusty red/brown, damp, dense, no plasticity, lower fine to upper fine grain, cohesive; organics visible 0-8" organics decreasing with depth; decreasing clay content with depth	745.2	745.2 (2.0)
		743.7	
5			
10	- SM: light brown/tan to orangish brown with zones of dark brown to rusty red, dry, loose, no plasticity, lower fine to lower medium with trace upper medium grain, <i>saprolite</i> , noncohesive; micaceous; visible mineralogy includes quartz, plagioclase, muscovite, biotite; completely weathered to residual soil; trace brittle rock fragments; zone of more competent rock fragments observed; lighter brown and tan zones, muscovite is the dominate mica visible; in darker brown zones biotite is the dominate mica visible; distinct platy crystal habit visible of micas (muscovite or biotite) within zones where saprolite is completely weathered and brittle but still competent enough not to be completeley broken down to residual soil		
15			
20	- SM: light brown/tan to orangish brown with zones of dark brown to rusty red, damp, loose, no plasticity, upper fine to upper medium grain, <i>saprolite</i> , noncohesive; micaceous; trace lower coarse grains observed; increasing rock fragments with depth; in zones of more competent rock fragments/saprolite, remnant rock fabric visible; lighter brown and tan zones, muscovite is the dominate mica visible; in darker brown zones biotite is the dominate mica visible		
			Annular Fill: 90/10 Portland Cement/Bentonite Powder

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:18 - \\VALTRCF02\X2DBSME\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ



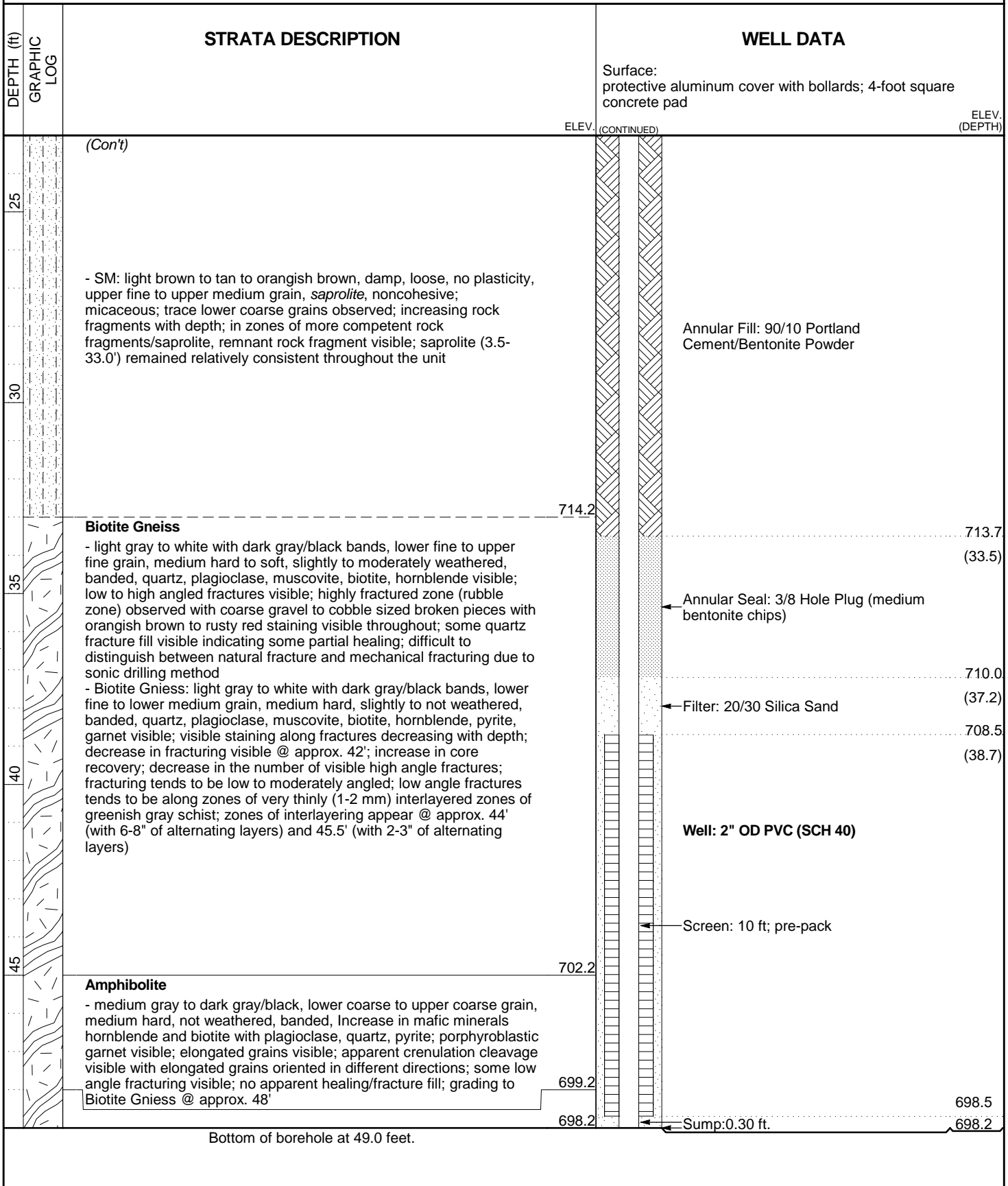
LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-14I
PAGE 2 OF 2
ECS37976

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study
LOCATION Newnan, GA

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/23/14 13:18 - \\VALTRCF02X2DBSMEL\$GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ





LOG OF TEST BORING

BORING PZ-25S
PAGE 1 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/1/2015 COMPLETED 9/2/2015 SURF. ELEV. 763.8 COORDINATES: N:1,258,856.99 E: 2,073,497.99

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 54 ft. GROUND WATER DEPTH: DURING _____ COMP. 20 ft. DELAYED 32.5 ft. after 24 hrs.

NOTES Top of casing elev.: 766.60

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCFP01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		- Hydro-excavate to 10 feet for utility clearance				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Clayey Silty Sand (SC-SM) - fill - mottled reddish yellow (7.5YR 7/8) and yellowish brown (10YR 5/8) dry, fine to coarse-grained, with mica				Surface Seal: concrete
15		- mottled yellowish red (5YR 5/8) and brown (7.5YR 5/3)				Annular Fill: cement-bentonite grout
20		- dark grayish brown / dark yellowish brown (10YR 4/2) - yellowish red (5YR 5/8)				
25		Clayey Silty Sand (SC-SM) - saprolite - dark greenish gray (10BG 4/1) dry, fine to coarse-grained, with mica				
30		- mottled olive gray (5Y 4/2), white / yellowish gray (5Y 8/1) and brown (10YR 4/3)				
35		Silty Sand (SM) - saprolite - banded pale brown (10YR 6/3), white (10YR 8/1) and red (2.5YR 5/8)				
40						

(Continued Next Page)



LOG OF TEST BORING

BORING PZ-25S
 PAGE 2 OF 2
 ECS37967

SOUTHERN COMPANY SERVICES, INC.
 EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
 LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\VALTRCFP01\W\SHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		very moist, fine to coarse-grained Silty Sand (SM) (Cont)				(CONTINUED) ← Annular Seal: bentonite pellets ← Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump: 0.299999999999997 ft.
50		- mottled brown (10YR 5/3), pale brown (10YR 6/3) and white (10YR 8/1) regolith wet, fine to coarse-grained, feldspar, quartz, mica				
55		Bottom of borehole at 54.0 feet.				
60						
65						
70						
75						
80						
85						



LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers
LOCATION Plant Yates

DATE STARTED 9/3/2015 COMPLETED 9/3/2015 SURF. ELEV. 763.8 COORDINATES: N: 1,258,860.75 E: 2,073,491.10

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 82 ft. GROUND WATER DEPTH: DURING 37 ft. COMP. 29 ft. DELAYED 33.7 ft. after 24 hrs.

NOTES Top of casing elev: 766.38

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCF01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		- Hydro-excavate to 10 feet for utility clearance				Surface Seal: concrete
10		Clayey Silty Sand (SC-SM) - fill - mottled reddish yellow (7.5YR 7/8) and yellowish brown (10YR 5/8) dry, fine to coarse-grained, with mica				Annular Fill: cement-bentonite grout
15		- mottled yellowish red (5YR 5/8) and brown (7.5YR 5/3)				
20		- dark grayish brown / dark yellowish brown (10YR 4/2)				
25		- yellowish red (5YR 5/8)				
30		Clayey Silty Sand (SC-SM) - saprolite - dark greenish gray (10BG 4/1) dry, fine to coarse-grained, with mica				
35		- mottled olive gray (5Y 4/2), white / yellowish gray (5Y 8/1) and brown (10YR 4/3)				
40		Silty Sand (SM) - saprolite - banded pale brown (10YR 6/3), white (10YR 8/1) and red (2.5YR 5/8)				

(Continued Next Page)



LOG OF TEST BORING

BORING PZ-251
PAGE 2 OF 2
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRC\F01\W\SHAUGNE\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
45		very moist, fine to coarse-grained Silty Sand (SM) (Cont) - mottled brown (10YR 5/3), pale brown (10YR 6/3) and white (10YR 8/1) regolith wet, fine to coarse-grained, feldspar, quartz, mica				(CONTINUED) Annular Fill: cement-bentonite grout Annular Seal: bentonite pellets Filter: silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack Sump: 0.299999999999997 ft.
50						
55		Biotite Gneiss - transition zone - mottled with brown (10YR 5/3) and white (10YR 8/1) fine to medium grain, soft to medium hard, highly weathered, inclined, banded				
60		- light gray (10YR 7/2) and brownish yellow (10YR 6/8) coarse grain, soft to medium hard, not to slightly weathered, inclined, banded, moderately fractured (vertical to sub-vertical), feldspar, quartz, biotite - hard				
65		- very soft, completely weathered - light yellowish brown (2.5Y 6/4), light gray (2.5Y 7/1) and olive gray / light olive gray (5Y 5/2) medium to coarse grain, moderately to highly weathered, inclined, banded, moderately fractured (sub-vertical to sub-horizontal), feldspar, quartz, biotite				
70		- iron stained fractures and whole rock				
75		- competent rock - gray (5Y 5/1), light gray (5Y 7/1) and greenish gray (10BG 5/1) not weathered, inclined, banded, slightly fractured - unfractured, feldspar, quartz, biotite, chlorite				
80						
85		Bottom of borehole at 82.0 feet.				



LOG OF TEST BORING

BORING PZ-31S
PAGE 1 OF 1
ECS37967

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Piezometers

LOCATION Plant Yates

DATE STARTED 9/23/2015 COMPLETED 9/24/2015 SURF. ELEV. 735.9 COORDINATES: N: 1,258,313.25 E: 2,073,820.25

CONTRACTOR Cascade EQUIPMENT _____ METHOD Rotosonic

DRILLED BY L. Yancey LOGGED BY W. Shaughnessy CHECKED BY _____ ANGLE _____ BEARING _____

BORING DEPTH 32 ft. GROUND WATER DEPTH: DURING 15 ft. COMP. _____ DELAYED 11.4 ft. after 48 hrs.

NOTES Top of casing elev: 738.62

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCP01\W\SHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Sand (SC) - strong brown (7.5YR 5/8) fill dry, fine to coarse-grained - dark reddish gray (5YR 4/2) oxidation hard pan				Surface Seal: concrete
		Well-graded Sand with Silt (SW-SM) - yellow / pale yellowish orange (10YR 8/6) soil dry, fine to coarse-grained, some angular quartz gravel, mica - red (2.5YR 4/6)				
10		Clayey Sand (SC) - dark brown (7.5YR 3/3) and reddish yellow (5YR 6/8) moist, fine to coarse-grained				Annular Fill: cement-bentonite grout
		Silty Sand (SM) - light brown (7.5YR 6/4) fine to coarse-grained, mica				
15		- white (2.5Y 8/1) - very moist				
		- yellowish brown / moderate yellowish brown (10YR 5/4) very moist				
20						Annular Seal: bentonite pellets
						Filter: silica filter sand
25		- light yellowish brown (10YR 6/4) wet				
		- yellowish brown / moderate yellowish brown (10YR 5/4) wet				
30						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
						Sump: 0.3000000000000001 ft.
		Bottom of borehole at 32.0 feet.				
35						
40						



CONTINUATION
CERTIFICATE

SAFECO INSURANCE COMPANY OF AMERICA

, Surety upon

a certain Bond No. 4993104

dated effective June 30 2005
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.
(PRINCIPAL)

and in favor of Georgia - Dept. of Natural Resources
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30 2007
(MONTH-DAY-YEAR)

and ending on June 30 2008
(MONTH-DAY-YEAR)

Amount of bond \$10,000

Description of bond License Bond - Water Well Contractors and Drillers

Premium:

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on June 30 2007
(MONTH-DAY-YEAR)
SAFECO INSURANCE COMPANY OF AMERICA

By *Laurel D. Huss*
ATTORNEY-IN-FACT Laurel D. Huss

Marsh USA, Inc.
Agent
3475 Piedmont Road NE, Suite 1200, Atlanta, GA 30305
Address of Agent
(404) 995-3702
Telephone Number of Agent





POWER OF ATTORNEY

Safeco Insurance Company of America
General Insurance Company of America
Safeco Plaza
Seattle, WA 98185

No. 6724

KNOW ALL BY THESE PRESENTS:

That SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby appoint

SANDRA S. CARTER; GARY D. EKLUND; JUDY S. FLEMING; LAUREL D. HUSS; BARBARA S. MACARTHUR; VIRGINIA B. MCMANUS; EDWARD L. MITCHELL; NANCY NIX; CHAUN M. WILSON; Atlanta, Georgia

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA have each executed and attested these presents

this 17th day of August 2006

Handwritten signature of Stephanie Daley-Watson

Handwritten signature of Tim Mikolajewski

STEPHANIE DALEY-WATSON, SECRETARY

TIM MIKOLAJEWSKI, SENIOR VICE-PRESIDENT, SURETY

CERTIFICATE

Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA:

Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business...

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

- (i) The provisions of Article V, Section 13 of the By-Laws, and
(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
(iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof.

I, Stephanie Daley-Watson, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

this 30th day of June 2007



Handwritten signature of Stephanie Daley-Watson

STEPHANIE DALEY-WATSON, SECRETARY

Safeco and the Safeco logo are registered trademarks of Safeco Corporation.

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.

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:

[x] CONTINUATION CERTIFICATE

This certificate extends the life of the bond to June 30, 2017. It is executed upon the express condition that the surety's liability under said bond, together with this and all previous continuation certificates, shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond.

Signed, sealed and dated this 26th day of May , 2015 .

Westchester Fire Insurance Company

By: Katie S

Katie Snider, Attorney-in-Fact

Surety of Record: Westchester Fire Insurance Company
436 Walnut Street
Philadelphia, PA 19106
Phone: (415) 547-4513

Agent of Record: Kibble & Prentice, a USI Company
601 Union Street, Suite 1000
Seattle, WA 98101
Phone: (206) 441-6300

Power of Attorney

WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and Vice Presidents of the Company in hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

Does hereby nominate, constitute and appoint Heather Allen, Holly E Ulfers, Katie Snider, Nancy N Hill, Roxana Palacios, Steven W Palmer, all of the City of SEATTLE, Washington, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Fifteen million dollars & zero cents (\$15,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 22 day of December 2014.

WESTCHESTER FIRE INSURANCE COMPANY



Stephen M. Haney
Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PHILADELPHIA

ss.

On this 22 day of December, AD. 2014 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
KAREN E. BRANDT, Notary Public
City of Philadelphia, Phila. County
My Commission Expires Sept. 26, 2018

Karen E. Brandt
Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 26th day of May, 2015.



William L. Kelly
William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 22, 2016.





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, William M. Smith, Derek Sabo, Charla M. Boadle**, 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: **unlimited** 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.

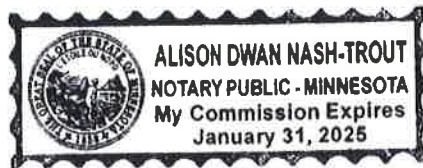
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-seventh day of April, 2020.



By *Paul J. Brehm*
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-seventh day of April, 2020, 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.

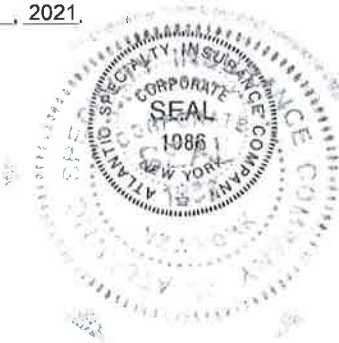


Alison Nash-Trout
Notary Public

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 12 day of April, 2021.

This Power of Attorney expires
January 31, 2025



Kara Barrow
Kara Barrow, Secretary

CONTINUATION
CERTIFICATE

Atlantic Specialty Insurance Company

, Surety upon

a certain Bond No. 800033976

dated effective 09/27/2017
(MONTH-DAY-YEAR)

on behalf of Ricky Davis / Cascade Drilling, L.P.
(PRINCIPAL)

and in favor of Department of Natural Resources, State of Georgia
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on 06/30/2021
(MONTH-DAY-YEAR)

and ending on 06/30/2023
(MONTH-DAY-YEAR)

Amount of bond Thirty Thousand and 00/100 Dollars (\$30,000.00)

Description of bond Performance Bond for Water Well Contractors

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 12th, 2021
(MONTH-DAY-YEAR)

Atlantic Specialty Insurance Company

By Andrew P. Larsen
Attorney-in-Fact Andrew P. Larsen

Parker, Smith & Feek, Inc.

Agent
2233 112th Ave NE Bellevue, WA 98004

Address of Agent

425-709-3600

Telephone Number of Agent

Mr. Joju Abraham
Southern Company
Environmental Solutions
241 Ralph McGill Blvd, NE
Atlanta, Georgia 30308

Arcadis U.S., Inc.
1210 Premier Drive
Suite 200
Chattanooga
Tennessee 37421
Tel 423 756 7193
Fax 423 756 7197
www.arcadis-us.com

Subject:
Monitoring Well and Piezometer Surveys
Plant Yates, 708 Dyer Road, Newnan, Georgia

Date:
June 29, 2020

Dear Mr. Abraham:

Contact:
Cory Williams, PLS

Attached is a copy of the reports for the Monitoring Well and Piezometer Surveys for the Phase I and Phase II Sites at Plant Yates. The Phase I and Phase II sites surveyed include the following specific areas:

Phone:
919.415.2348

- AMA, Ash Management Area
- AP-1, Former Ash Pond 1
- AP-2, Ash Pond 2
- Gypsum Landfill

Email:
cory.williams@arcadis.com

We appreciate the opportunity to work with Georgia Power and look forward to working with you in the future. If you need additional information, please feel free to contact me.

Our ref:
30054533

Sincerely,

Arcadis U.S., Inc.



A. Cory Williams, PLS
Survey Department Manager

Attachments

Copies:
Geoffrey Gay, PE
Rick Helmadollar, PE
A. Lee Robertson IV, PLS

DESCRIPTION AND SCOPE

The task included performing horizontal and vertical field survey locations of the existing well networks (including all monitoring wells and piezometers). The Arcadis field survey team obtained horizontal and vertical locations for the top of the well casing (TOC) and surveyed the nail located on the concrete pad around the well. Where no nail was present, the field crew surveyed the top of the concrete well pad. The Arcadis field team utilized a combination of Leica GS16 Global Positioning System (GPS) with traditional Leica MS60 Robotic Total Station field survey equipment and methods to obtain horizontal locations of the TOC and/or nail or top of the concrete well pad. All horizontal field survey locations are relative to the Georgia State Plane Coordinate System, West Zone, NAD1983, US Survey Feet. All horizontal locations meet or exceed an accuracy level of 0.50 foot. All vertical field survey locations were obtained from a level loop, performed with the Leica DNA03 digital level. Next, we began from a benchmark set, by utilizing GPS Static Session with an OPUS solution and subsequently verified via the eGPS RTN Network and ran through all well and piezometer locations to close on the beginning benchmark to confirm accuracy. All vertical elevations are referenced to NAVD1988, US Survey Feet and meet an accuracy standard of 0.01 foot.

See the attached exhibits detailing the Monitoring Well and Piezometer surveyed locations for each Phase I and Phase II site.

SUMMARY

The field survey crew performed the survey in June 2020 with the findings or observations summarized below:

- The ground elevation survey location was taken adjacent to the concrete base point (PK, Disk or Chiseled X). Note that at some locations, the concrete base was buried under soil; consequently, the ground elevation is higher than the concrete base point location.
- The horizontal location for monitoring well GWC-6R at the Gypsum Landfill is approximately +/-51 feet southeasterly of the provided coordinate location as detailed in “Georgia Power Company Plant Yates, Private Industrial Landfill, Permit No. 038-014D (I), Replacement Monitoring Well GWC-6R Certification, ES1703”, dated July 2010. See attached Photograph Log.

Monitoring Well Summary

Site	Monitoring Wells	Piezometers
AMA = Ash Management Area	25	8
AP-1 = Former Ash Pond 1	5	5
AP-2 = Ash Pond 2	14	8
Gypsum Landfill	7	0

CERTIFICATION

I, A. Lee Robertson IV, being a Georgia Licensed Professional Land Surveyor, in accordance with the Georgia Board of Professional Engineers and Land Surveyors do hereby certify that the information contained herein is true and correct and has been prepared in accordance with generally accepted good land survey practices under my supervision, and the data is reliable to a horizontal accuracy of 0.5 foot and an elevational accuracy of 0.01 foot for each surveyed point.

FINAL REVIEW:

A. Lee Robertson IV

DATE: June 29, 2020



Digitally signed by A Lee
Robertson IV
Reason: Revised Yates
Date: 2020.08.06 09:22:42
-04'00'

A. Lee Robertson IV, ARM, PLS, PSM
1301 Riverplace Blvd., Suite 700
Jacksonville, FL 32207
904.493.8589



EXHIBIT 1



Plant Yates – AMA Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWA-4I	Casing	784.21	1254436.68	2075455.62	33° 26' 47.432" N	84° 53' 29.831" W
	Disk	782.00	1254436.75	2075456.65		
	Ground	781.9				
YGWA-5I	Casing	784.54	1254399.95	2076218.86	33° 26' 47.122" N	84° 53' 20.821" W
	Disk	782.21	1254400.71	2076219.39		
	Ground	782.1				
YGWA-5D	Casing	784.53	1254396.67	2076223.63	33° 26' 47.089" N	84° 53' 20.764" W
	Disk	782.16	1254397.45	2076224.30		
	Ground	781.9				
YGWA-17S	Casing	783.05	1257602.79	2076758.31	33° 27' 18.846" N	84° 53' 14.717" W
	PK Nail	780.14	1257603.70	2076758.38		
	Ground	780.2				
YGWA-18S	Casing	790.57	1257116.05	2077015.25	33° 27' 14.048" N	84° 53' 11.644" W
	PK Nail	787.69	1257116.98	2077015.60		
	Ground	787.6				
YGWA-18I	Casing	790.57	1257090.05	2077015.82	33° 27' 13.791" N	84° 53' 11.635" W
	PK Nail	787.90	1257094.38	2077023.55		
	Ground	787.9				
YGWA-20S	Casing	767.12	1255531.55	2077410.37	33° 26' 58.399" N	84° 53' 06.851" W
	PK Nail	764.41	1255531.12	2077409.22		
	Ground	764.6				
YGWA-21I	Casing	783.70	1255538.27	2076768.14	33° 26' 58.421" N	84° 53' 14.432" W
	PK Nail	780.62	1255537.44	2076768.81		
	Ground	780.8				
YGWC-23S	Casing	764.91	1256366.93	2074734.07	33° 27' 06.479" N	84° 53' 38.506" W
	PK Nail	761.74	1256367.40	2074734.44		
	Ground	762.0				
YGWC-24SA	Casing	765.00	1258907.98	2073924.81	33° 27' 31.563" N	84° 53' 48.268" W
	PK Nail	762.08	1258909.02	2073924.05		
	Ground	762.0				
YGWC-36	Casing	739.61	1258514.02	2073770.14	33° 27' 27.654" N	84° 53' 50.061" W
	PK Nail	737.04	1258513.74	2073771.01		
	Ground	736.9				
YGWC-49	Casing	782.73	1259375.23	2074337.51	33° 27' 36.214" N	84° 53' 43.435" W
	PK Nail	780.11	1259375.91	2074337.14		
	Ground	780.1				

EXHIBIT 1



Plant Yates – AMA Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWA-6S	Casing	782.47	1260484.87	2074786.49	33° 27' 47.223" N	84° 53' 38.227" W
	Disk	780.06	1260485.50	2074785.70		
	Ground	779.8				
YGWA-6I	Casing	782.73	1260490.02	2074790.49	33° 27' 47.275" N	84° 53' 38.181" W
	Disk	780.36	1260490.74	2074789.66		
	Ground	780.2				
YAMW-1	Casing	743.83	1258602.12	2073814.55	33° 27' 28.529" N	84° 53' 49.543" W
	PK Nail	741.11	1258602.93	2073815.29		
	Ground	740.9				
PZ-04S	Casing	784.25	1254442.86	2075454.20	33° 26' 47.493" N	84° 53' 29.848" W
	Disk	781.94	1254443.16	2075455.15		
	Ground	781.8				
PZ-05S	Casing	784.64	1254404.42	2076211.43	33° 26' 47.165" N	84° 53' 20.909" W
	Disk	782.31	1254405.12	2076212.12		
	Ground	782.2				
PZ-06D	Casing	782.02	1260480.15	2074782.68	33° 27' 47.176" N	84° 53' 38.272" W
	Disk	779.65	1260480.84	2074782.04		
	Ground	779.5				
PZ-24IA	Casing	764.65	1258910.76	2073930.07	33° 27' 31.591" N	84° 53' 48.206" W
	PK Nail	761.89	1258911.68	2073929.64		
	Ground	761.8				
PZ-35	Casing	743.81	1258593.16	2073805.60	33° 27' 28.440" N	84° 53' 49.649" W
	PK Nail	741.09	1258593.85	2073806.06		
	Ground	740.9				
PZ-48	Casing	779.83	1259868.04	2074528.00	33° 27' 41.103" N	84° 53' 41.228" W
	PK Nail	777.29	1259868.75	2074527.27		
	Ground	777.2				
YGWA-39	Casing	818.19	1255717.13	2073865.58	33° 26' 59.990" N	84° 53' 48.702" W
	PK Nail	815.58	1255717.96	2073865.39		
	Ground	815.6				
YGWA-40	Casing	815.73	1255791.95	2073431.34	33° 27' 00.700" N	84° 53' 53.833" W
	PK Nail	813.45	1255792.83	2073431.58		
	Ground	813.5				

EXHIBIT 1



Plant Yates – AMA Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWC-38	Casing	799.69	1256108.38	2074446.80	33° 27' 03.901" N	84° 53' 41.875" W
	PK Nail	797.24	1256108.41	2074446.02		
	Ground	797.1				
YGWC-41	Casing	803.92	1256510.62	2073274.41	33° 27' 07.799" N	84° 53' 55.745" W
	PK Nail	801.23	1256509.74	2073274.29		
	Ground	801.1				
YGWC-42	Casing	797.86	1256882.87	2073326.52	33° 27' 11.486" N	84° 53' 55.161" W
	PK Nail	795.34	1256881.68	2073326.58		
	Ground	795.1				
YGWC-43	Casing	744.96	1257547.41	2073199.65	33° 27' 18.052" N	84° 53' 56.714" W
	PK Nail	742.50	1257546.78	2073200.55		
	Ground	742.3				
PZ-37	Casing	760.78	1256471.14	2074699.59	33° 27' 07.508" N	84° 53' 38.922" W
	PK Nail	758.10	1256471.89	2074700.06		
	Ground	758.0				
PZ-51	Casing	744.30	1257595.80	2073182.55	33° 27' 18.529" N	84° 53' 56.920" W
	PK Nail	741.23	1257595.53	2073181.53		
	Ground	741.3				
YAMW-2	Casing	781.04	1256780.59	2072924.89	33° 27' 10.446" N	84° 53' 59.893" W
	PK Nail	777.81	1256781.38	2072926.79		
	Ground	777.9				
YAMW-3	Casing	796.05	1256915.25	2073345.21	33° 27' 11.808" N	84° 53' 54.943" W
	PK Nail	792.98	1256914.96	2073344.24		
	Ground	793.2				
YAMW-4	Casing	805.59	1256532.64	2073280.71	33° 27' 08.018" N	84° 53' 55.673" W
	PK Nail	802.60	1256532.72	2073281.78		
	Ground	802.6				
YAMW-5	Casing	788.90	1256140.21	2074486.69	33° 27' 04.219" N	84° 53' 41.407" W
	PK Nail	785.87	1256139.54	2074487.44		
	Ground	785.9				

Notes:

NAD83(2011) coordinates established by utilizing eGPS VRS & OPUS Solutions

Elevations derived from Arcadis BM#1 (El. 758.24)

Elevations & coordinates are U.S. Survey feet

EXHIBIT 2



Plant Yates – AP-1 Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWA-47	Casing	758.22	1262411.84	2071818.05	33° 28' 06.081" N	84° 54' 13.428" W
	PK Nail	755.73	1262410.74	2071817.99		
	Ground	755.6				
YGWC-44	Casing	758.35	1261874.34	2071219.39	33° 28' 00.721" N	84° 54' 20.449" W
	PK Nail	755.7	1261874.44	2071218.47		
	Ground	755.5				
YGWC-45	Casing	719.36	1261668.95	2070912.60	33° 27' 58.667" N	84° 54' 24.053" W
	PK Nail	716.72	1261668.87	2070911.87		
	Ground	716.5				
YGWC-52	Casing	755.86	1262145.22	2071464.36	33° 28' 03.418" N	84° 54' 17.580" W
	PK Nail	752.99	1262144.65	2071465.21		
	Ground	752.9				
YGWC-46A	Casing	733.04	1260994.59	2070970.30	33° 27' 52.000" N	84° 54' 23.316" W
	PK Nail	730.16	1260994.40	2070971.40		
	Ground	730.1				
PZ-09S	Casing	712.08	1262003.49	2070720.43	33° 28' 01.963" N	84° 54' 26.350" W
	Disk	709.90	1262003.23	2070721.54		
	Ground	709.8				
PZ-09I	Casing	712.13	1261995.81	2070720.09	33° 28' 01.887" N	84° 54' 26.353" W
	Disk	709.92	1261995.51	2070721.11		
	Ground	709.8				
PZ-10S	Casing	700.43	1260802.29	2070552.32	33° 27' 50.068" N	84° 54' 28.233" W
	Disk	698.02	1260802.21	2070553.31		
	Ground	698.1				
PZ-10I	Casing	700.25	1260809.64	2070551.98	33° 27' 50.068" N	84° 54' 28.233" W
	Disk	697.96	1260809.55	2070552.97		
	Ground	697.8				
PZ-53	Casing	732.90	1260964.50	2070920.38	33° 27' 51.698" N	84° 54' 23.902" W
	PK Nail	729.99	1260964.35	2070921.22		
	Ground	729.9				

Notes:
 NAD83(2011) coordinates established by utilizing eGPS VRS & OPUS Solutions
 Elevations derived from Arcadis BM#1 (El. 758.24)
 Elevations & coordinates are U.S. Survey feet

EXHIBIT 3



Plant Yates – AP-2 Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWA-1I	Casing	836.60	1256876.13	2070097.91	33° 27' 11.193" N	84° 54' 33.266" W
	Disk	834.33	1256876.76	2070098.84		
	Ground	834.3				
YGWA-1D	Casing	837.25	1256867.34	2070104.61	33° 27' 11.106" N	84° 54' 33.186" W
	Disk	835.04	1256868.01	2070105.52		
	Ground	834.9				
YGWA-2I	Casing	866.25	1256144.08	2070790.49	33° 27' 03.999" N	84° 54' 25.030" W
	Disk	864.2	1256144.35	2070791.29		
	Ground	864.0				
YGWA-3I	Casing	796.55	1256405.20	2072024.20	33° 27' 06.669" N	84° 54' 10.492" W
	Disk	794.34	1256405.65	2072025.23		
	Ground	794.0				
YGWA-3D	Casing	796.78	1256399.94	2072026.21	33° 27' 06.617" N	84° 54' 10.468" W
	Disk	794.39	1256400.26	2072027.12		
	Ground	794.1				
YGWA-14S	Casing	748.76	1257828.64	2072537.24	33° 27' 20.788" N	84° 54' 04.555" W
	Disk	746.58	1257829.68	2072537.61		
	Ground	746.8				
YGWA-30I	Casing	762.58	1258421.86	2071107.11	33° 27' 26.556" N	84° 54' 21.485" W
	PK Nail	759.95	1258421.69	2071106.13		
	Ground	760.1				
YGWC-26S	Casing	716.28	1259734.66	2070615.87	33° 27' 39.510" N	84° 54' 27.393" W
	PK Nail	713.17	1259734.57	2070614.87		
	Ground	713.1				
YGWC-26I	Casing	715.91	1259725.79	2070613.56	33° 27' 39.422" N	84° 54' 27.420" W
	PK Nail	713.21	1259725.80	2070612.71		
	Ground	713.1				
YGWC-27S	Casing	716.52	1259417.12	2070454.17	33° 27' 36.357" N	84° 54' 29.275" W
	PK Nail	713.27	1259416.33	2070454.96		
	Ground	713.0				
YGWC-27I	Casing	716.19	1259423.73	2070460.89	33° 27' 36.423" N	84° 54' 29.196" W
	PK Nail	713.35	1259423.32	2070461.64		
	Ground	713.2				
YGWC-28S	Casing	717.95	1259218.37	2070322.23	33° 27' 34.381" N	84° 54' 30.816" W
	PK Nail	715.09	1259217.72	2070323.07		
	Ground	715.0				

EXHIBIT 3



Plant Yates – AP-2 Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWC-28I	Casing	717.93	1259226.47	2070328.27	33° 27' 34.462" N	84° 54' 30.745" W
	PK Nail	715.06	1259225.93	2070329.06		
	Ground	715.0				
YGWC-29I	Casing	717.39	1258974.06	2070203.26	33° 27' 31.956" N	84° 54' 32.199" W
	PK Nail	714.94	1258973.51	2070203.93		
	Ground	714.8				
PZ-01S	Casing	836.84	1256871.97	2070101.24	33° 27' 11.152" N	84° 54' 33.226" W
	Disk	834.73	1256874.29	2070101.35		
	Ground	834.5				
PZ-03S	Casing	796.39	1256410.86	2072021.63	33° 27' 06.725" N	84° 54' 10.523" W
	Disk	794.31	1256411.38	2072022.63		
	Ground	794.0				
PZ-13S	Casing	807.79	1257849.98	2069810.25	33° 27' 20.807" N	84° 54' 36.743" W
	Disk	805.59	1257848.97	2069810.38		
	Ground	805.5				
PZ-13I	Casing	807.62	1257850.30	2069817.10	33° 27' 20.811" N	84° 54' 36.662" W
	Disk	805.42	1257849.17	2069817.19		
	Ground	805.4				
PZ-14I	Casing	749.06	1257826.16	2072542.59	33° 27' 20.764" N	84° 54' 04.492" W
	Disk	746.84	1257827.25	2072543.09		
	Ground	747.2				
PZ-25S	Casing	766.60	1258856.99	2073497.99	33° 27' 31.029" N	84° 53' 53.301" W
	PK Nail	763.77	1258857.85	2073498.45		
	Ground	763.8				
PZ-25I	Casing	766.38	1258860.75	2073491.10	33° 27' 31.065" N	84° 53' 53.383" W
	PK Nail	763.69	1258861.69	2073491.62		
	Ground	763.8				
PZ-31S	Casing	738.62	1258313.70	2072820.25	33° 27' 25.606" N	84° 54' 01.256" W
	PK Nail	736.04	1258312.79	2072820.01		
	Ground	735.9				

Notes:

NAD83(2011) coordinates established by utilizing eGPS VRS & OPUS Solutions

Elevations derived from Arcadis BM#1 (El. 758.24)

Elevations & coordinates are U.S. Survey feet

EXHIBIT 4



Plant Yates – Gypsum Landfill Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
GWA-2	Casing	805.62	1261383.11	2073509.98	33° 27' 56.021" N	84° 53' 53.370" W
	Bolt	803.25	1261383.21	2073507.93		
	Ground	803.1				
GWC-1R	Casing	773.27	1261869.77	2073279.85	33° 28' 00.820" N	84° 53' 56.127" W
	Bolt	770.69	1261868.10	2073281.57		
	Ground	770.5				
GWC-2R	Casing	769.76	1261942.15	2072755.92	33° 28' 01.499" N	84° 54' 02.317" W
	Bolt	767.13	1261944.58	2072756.60		
	Ground	766.8				
GWC-3R	Casing	775.25	1261647.10	2072841.28	33° 27' 58.586" N	84° 54' 01.285" W
	Bolt	772.32	1261646.62	2072843.63		
	Ground	772.2				
GWC-4R	Casing	757.48	1262046.56	2072953.68	33° 28' 02.546" N	84° 53' 59.992" W
	Bolt	754.88	1262044.70	2072955.00		
	Ground	754.6				
GWC-5R	Casing	782.45	1261439.91	2073027.56	33° 27' 56.550" N	84° 53' 59.069" W
	Bolt	779.69	1261441.13	2073029.78		
	Ground	780.0				
GWC-6R	Casing	788.98	1261732.91	2073479.40	33° 27' 59.480" N	84° 53' 53.760" W
	Bolt	785.95	1261730.98	2073478.53		
	Ground	785.6				

Notes:

NAD83(2011) coordinates established by utilizing eGPS VRS & OPUS Solutions
 Elevations derived from Arcadis BM#1 (El. 758.24)
 Elevations & coordinates are U.S. Survey feet

PHOTOGRAPH LOG

Plant Yates – Monitoring Well and Piezometer Survey
June 2020



Photograph: 1

Description:
Staked Coordinate
Location for GWC-6R



Photograph: 2

Description:
From Staked Location
of GWC-6R to Found
Location of GWC-6R

PHOTOGRAPH LOG

Plant Yates – Monitoring Well and Piezometer Survey
June 2020



Photograph: 3

Description:
Existing Location of
GWC-6R

Ms. Lauren Hartley
Southern Company
Environmental Solutions
241 Ralph McGill Blvd, NE
Atlanta, GA 30308

Subject:
YGWC-29IA
Plant Yates, 708 Dyer Road, Newnan, Georgia

Dear Ms. Hartley:

Attached is a copy of the survey report for YGWC-29IA at Plant Yates.

We appreciate the opportunity to work with Georgia Power and look forward to working with you in the future. If you need additional information, please feel free to contact me.

Sincerely,
Arcadis U.S., Inc.

Mike Peppers, PLS
Survey Department Manager

Attachments

Copies:
Geoffrey Gay, PE

Arcadis U.S., Inc.
2839 Paces Ferry
Road SE
Suite 900 Atlanta
Georgia 30339
Tel 770.431-8666
Fax 770.435.2666
www.arcadis.com

Date:
February 10, 2023

Contact:
Mike Peppers, PLS

Phone:
770.384.6638

Email:
mike.peppers@arcadis.com

Our ref:
30143626

DESCRIPTION AND SCOPE

Arcadis performed horizontal and vertical field survey locations at YGWC-291A. The Arcadis field survey team obtained horizontal and vertical locations for the top of the well casing (TOC) and surveyed the nail located on the concrete pad around the well. The team completed the field survey on this 1 location on 02/01/2023.

The Arcadis field team utilized a of Leica GS16 Global Positioning System (GPS) to obtain horizontal locations of the TOC and/or nail or top of the concrete well pad. All horizontal field survey locations are relative to the Georgia State Plane Coordinate System, West Zone, NAD1983, US Survey Feet. All horizontal locations meet or exceed an accuracy level of 0.50 foot. All vertical field survey locations were obtained from a level loop, performed with the Leica DNA03 digital level.

See the attached exhibit detailing the surveyed location for YGWC-291A.

CERTIFICATION

I, Mike Peppers, being a Georgia Licensed Professional Land Surveyor, in accordance with the Georgia Board of Professional Engineers and Land Surveyors do hereby certify that the information contained herein is true and correct and has been prepared in accordance with generally accepted good land survey practices under my supervision, and the data is reliable to a horizontal accuracy of 0.5 foot and an elevational accuracy of 0.01 foot for each surveyed point.

FINAL REVIEW:

Mike Peppers, PLS

DATE: February 10, 2023



Mike Peppers, PLS
2839 Paces Ferry Road SE
Suite 900
Atlanta, GA 30339
770.431-8666

EXHIBIT 1

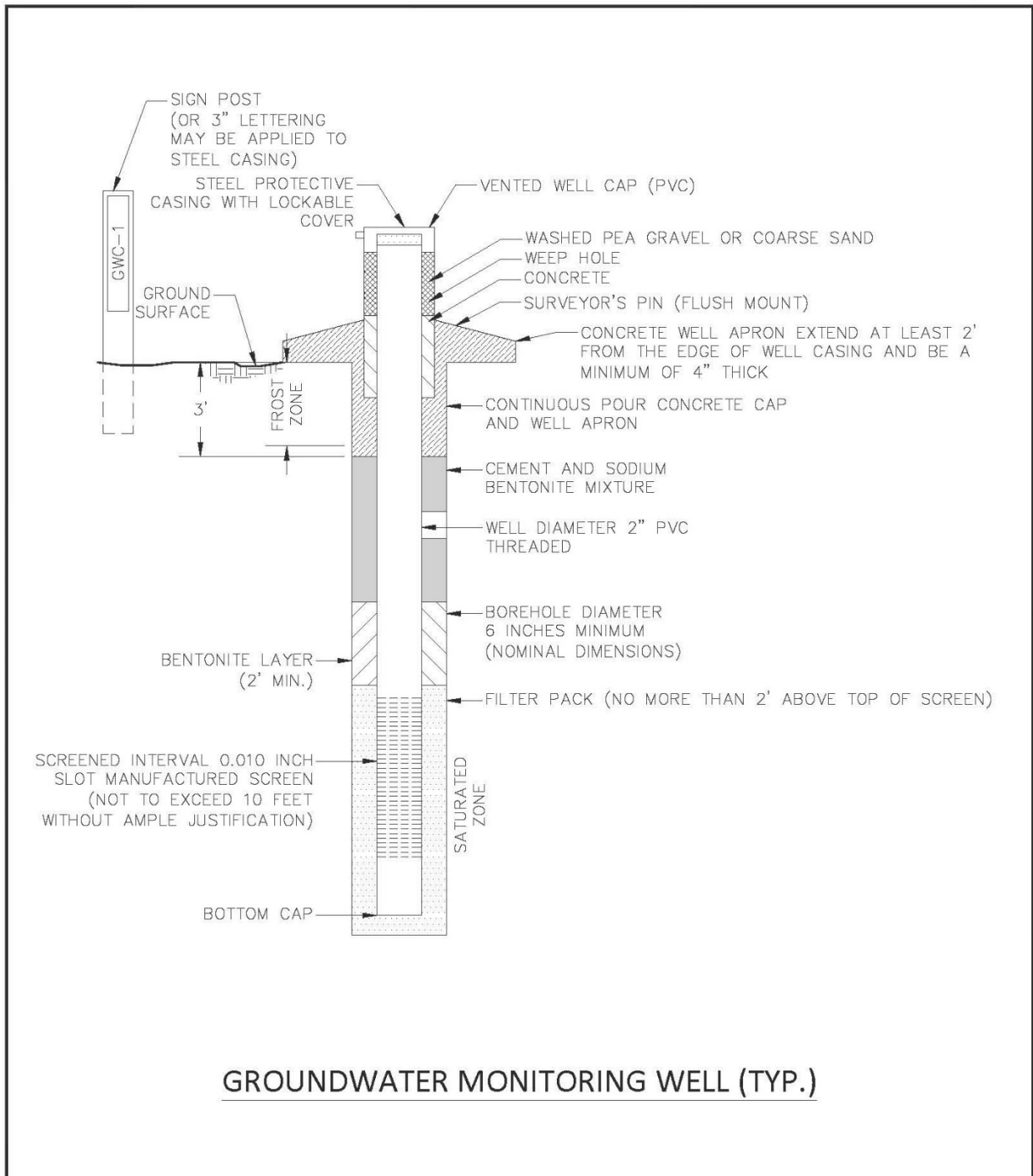
Plant Yates – AMA Monitoring Well and Piezometer Surveys

Monument	Concrete Base Point	NAVD88 Elevation	Georgia State Plane Grid (NAD83), West Zone		WGS84 Latitude	Longitude
			Northing	Easting		
YGWC-29IA	Casing	711.80	1258981.85	2070212.16	33° 27' 32.033" N	84° 54' 32.095" W
	Disk	709.04	1258982.62	2070212.56		
	Ground	709.0				

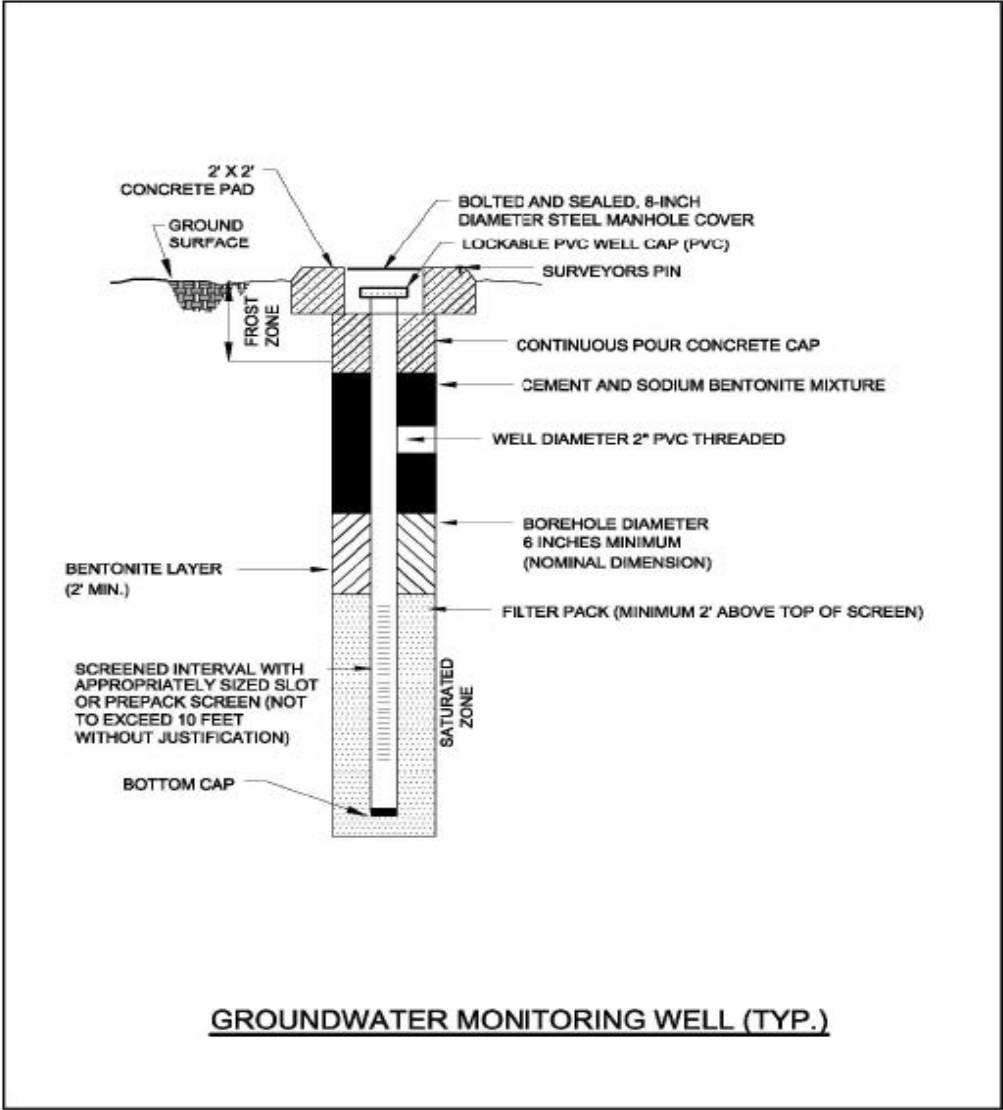
Notes:

NAD83(2011) coordinates system on site established by utilizing eGPS VRS & OPUS Solutions Elevations derived from Arcadis BM#1 (El. 758.24)
 Elevations & coordinates are U.S. Survey feet

APPENDIX D1. GROUNDWATER MONITORING WELL DETAIL



APPENDIX D2. GROUNDWATER MONITORING WELL DETAIL FLUSH-MOUNT SURFACE COMPLETION



APPENDIX E. GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling will be conducted using the most current USEPA Region 4 Field Quality and Technical Procedures as a guide. 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.

Sampling personnel 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 Georgia Power 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 0.01 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 (2) 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 using procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division (SESD) Operating Procedure for Field Equipment Cleaning and Decontamination as a guide.
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 foot 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 SU for pH

±5% for specific conductance (conductivity)

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

≤5 NTUs for turbidity

Temperature – Record only, not used for stabilization criteria

ORP – Record only, not used for stabilization criteria.

7. Collect samples at a low flow rate between 100 and 200 mL/min, according to the most current version of USEPA SESD SEDPROC-301-R4, Operating Procedure – Groundwater Sampling, 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 chain-of-custody (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 will be 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 NTUs; however, samples may be collected where turbidity is less than 10 NTUs and the stabilization criteria described above are met.

If sample turbidity is greater than 10 NTUs and all other stabilization criteria have been met, samplers will continue purging for up to 3 additional hours in order to reduce the turbidity to less than 10 NTU, as follows:

- If turbidity remains above 5 NTUs but is less than 10 NTUs, and all other parameters are stabilized, the well can be sampled.
- Where turbidity remains above 10 NTUs, 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 COC form.