# GROUNDWATER MONITORING PLAN (rev. 1)

# PLANT YATES R6 CCR LANDFILL - ASH MANAGEMENT AREA COWETA COUNTY, GEORGIA

**FOR** 



**JULY 2021** 



### **TABLE OF CONTENTS**

l.	CERTIF	ICATION	1
1.	INTRO	DUCTION	2
2.	GEOLO	OGIC AND HYDROGEOLOGIC CONDITIONS	3
3.	WELL I	OCATIONS	5
4.	MONIT	TORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING	6
	4.1	DRILLING	6
	4.2	DESIGN AND CONSTRUCTION	6
	4.3	ABANDONMENT	8
	4.4	DOCUMENTATION	9
<b>5.</b>	GROUI	NDWATER MONITORING PARAMETERS AND FREQUENCY	10
6.	SAMPI	.E COLLECTION	13
<b>7.</b>	CHAIN	-OF-CUSTODY	14
8.	FIELD /	AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL	<b>15</b>
9.	REPOR	TING RESULTS	16
10.	STATIS	TICAL ANALYSIS	18
TABLE	S		
<b>TABLE</b>	1	GROUNDWATER MONITORING PARAMATERS AND FREQUENCY	
TABLE	2	ANALYTICAL METHODS AND REPORTING LIMITS	
FIGUR	ES		
<b>FIGUR</b>	E 1	STATISTICAL ANALYSIS PLAN OVERVIEW	
FIGUR	E 2	DECISION LOGIC FOR COMPUTING PREDICTION LIMITS	
APPEN	IDICES		
<b>APPEN</b>	IDIX A.	MONITORING SYSTEM DETAILS	
<b>APPEN</b>	IDIX B.	HYDRAULIC CONDUCTIVITY TESTING RESULTS	
<b>APPEN</b>	IDIX C.	BORING LOGS AND WELL CONSTRUCTION DIAGRAMS	
<b>APPEN</b>	IDIX D.	GROUNDWATER MONITORING WELL DETAIL	
APPEN	IDIX E.	GROUNDWATER SAMPLING PROCEDURES	

### 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, Chapter 391-3-4.10(6). According to 391-3-4-.01(57), a Qualified Groundwater Scientist is "a professional engineer or geologist registered to practice in Georgia who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action." The design of the groundwater monitoring system was developed in compliance with the Georgia Environmental Protection Division (GA EPD) Rules Solid Waste Management, Chapter 391-3-4.10(6).

Environmental Protection Division (GA EPD) Rules of Solid Waste Management, Chapter 391-3-4.10(6).

Signature:

Date: 2021-05-26

### 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 in Appendix A, Figure 1 and well construction details are presented in Table 1 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 R6 Ash Monofill-Ash Management Area (R6-AMA) has been installed. 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. An Assessment of Corrective Measures has been initiated as required by 391-3-4.10(6)(a) and §257.96.

### 2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

A Hydrogeological Assessment report was prepared in 2018 and provides a more comprehensive review of both the geological lithology and the hydrogeological conceptual site model. R6 - AMA 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 layer soil 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 increasing 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. A recent water table elevation contour map showing overall flow directions is provided in Appendix A, Figure 2. 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 weather 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 steams 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 R6-AMA 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<sup>-3</sup> cm/sec to 10<sup>-4</sup> cm/sec). Appendix A, Table 1, Monitoring System Details, presents summaries of the K testing values from R6-AMA 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.

There are significant differences in rock type at the facility that may result in localized geochemical signatures in groundwater. The presence of ultramafic bodies (e.g. amphibolites) contribute to higher

background concentrations of metals where present. Weathering of minerals occurring in schist such as garnets and staurolite may result in elevated levels of iron, manganese, calcium, and zinc in groundwater. The presence of granitic lithologies may contribute to elevated levels of radium 226/228 in groundwater. Additionally, weathering of sulfide minerals such as pyrite has the potential to alter groundwater pH and lead to increased mineral solubility. Boring logs and well construction diagrams for monitoring well locations within R6-AMA are presented in Appendix C.

The horizontal hydraulic gradient across R6-AMA was measured during the September 2020 groundwater monitoring event from YGWA-40 to YGWC-2R and YGWC-49 to PZ-24I resulting in an average estimated horizontal gradient of 0.022 ft/ft.

Average groundwater flow velocity in the R6-AMA area is based on K, lateral gradient (i) and effective porosity ( $P_e$ ). The average K for the site is 505 feet/year, and the gradient across R6-AMA was 0.022 ft/ft, and the effective porosity ( $n_e$ ) was estimated at 0.20. The average groundwater velocity is calculated as:

 $V_{gw} = (K)(i)/n_e = ((505 \text{ ft/year}) (0.022 \text{ ft/ft})/0.20) = 56 \text{ feet/year}.$ 

### 3. WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost occurrence of groundwater beneath the site. Locations are selected based on disposal cell layouts 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).

Monitoring wells will generally be located outside of areas with frequent auto traffic; however, wells may be installed in heavily trafficked areas when necessary, to meet the groundwater monitoring objectives of the EPD rules.

A map depicting monitoring well locations is provided on Figure 1 in Appendix A. A tabulated list of individual monitoring wells and piezometers (included in the potentiometric map) with well construction details such as location coordinates, top-of-casing elevations, well depths, and screened intervals is included in Table 1 of Appendix A. Any change to the groundwater monitoring network must be made by a minor modification to the permit pursuant to 391-3-4-4.10(6)(g)7.

The following ten (10) upgradient monitoring wells and well pairs will be utilized as part of the R6-AMA monitoring network system: YGWA-39, YGWA-40, YGWA-41, YGWA-51 and YGWA-5D, YGWA-17S, YGWA-18S and YGWA-18I, YGWA-20S and YGWA-21I. There are nine (9) 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 in Table 1 of Appendix A.

The following nine (9) downgradient monitoring wells will be utilized as part of the R6-AMA monitoring network system: YGWC-23S, YGWC-24SA, YGWC-36A, YGWC-38, YGWC-41, YGWC-42, YGWC-43, YGWC-49 and proposed monitoring well YGWC-50. The monitoring well locations are shown in Appendix A, Figure 1.

# 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 construction data are provided on Table 1 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 rotosonic 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 U.S. Environmental Protection Agency Science and Ecosystem Support Division 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 assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

Pre-packed dual-wall well screens 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 U.S. Environmental Protection Agency Science and Ecosystem Support Division 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 approximately one to 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 2.0 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 detail attached in Appendix D, Groundwater Monitoring Well Detail, 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 maximum turbidity of 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.

### 4.4 DOCUMENTATION

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

- 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 (±0.1 feet),
- 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,
- 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

### 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. Assessment monitoring was initiated on May 15, 2018 at Ash Ponds 3, B, and B', September 2019 for Ash Pond A, and November 13, 2019 for R6 Landfill, per Chapter 391-3-4-.10, Georgia Rules for Solid Waste Management.

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

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

# 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/90405C
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	300.0/300.1/9214/9056A
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<sup>™</sup> 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. 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
- Dates of possession by each individual

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 will be 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 also 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.

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 brief overview of purging/sampling methodologies.
- 3. Discussion of results.
- 4. Recommendations for the future monitoring consistent with the Rules.
- 5. Potentiometric surface contour map for the aquifer(s) 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.

### 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.

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.

### FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

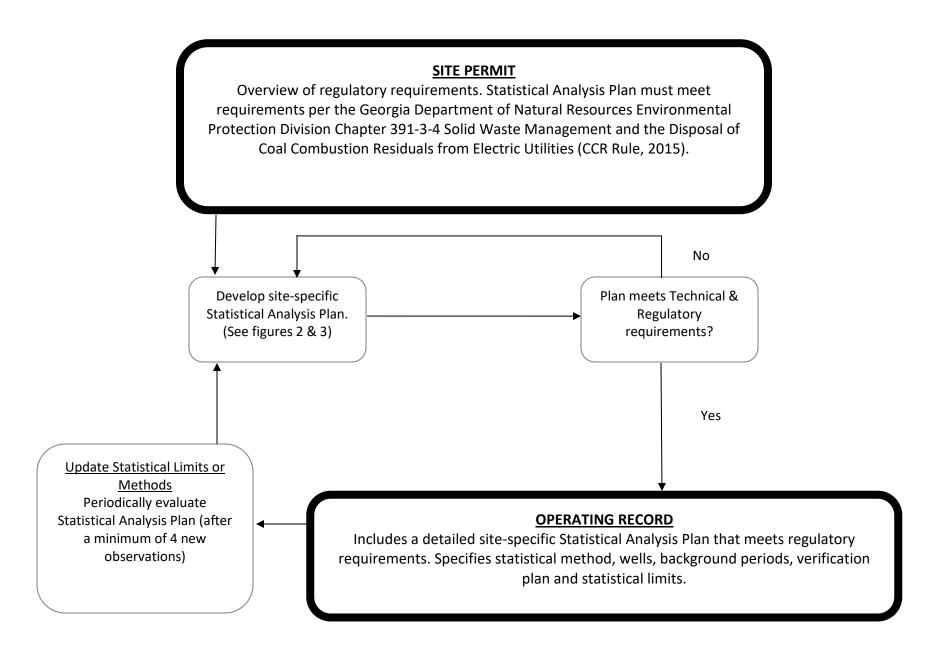
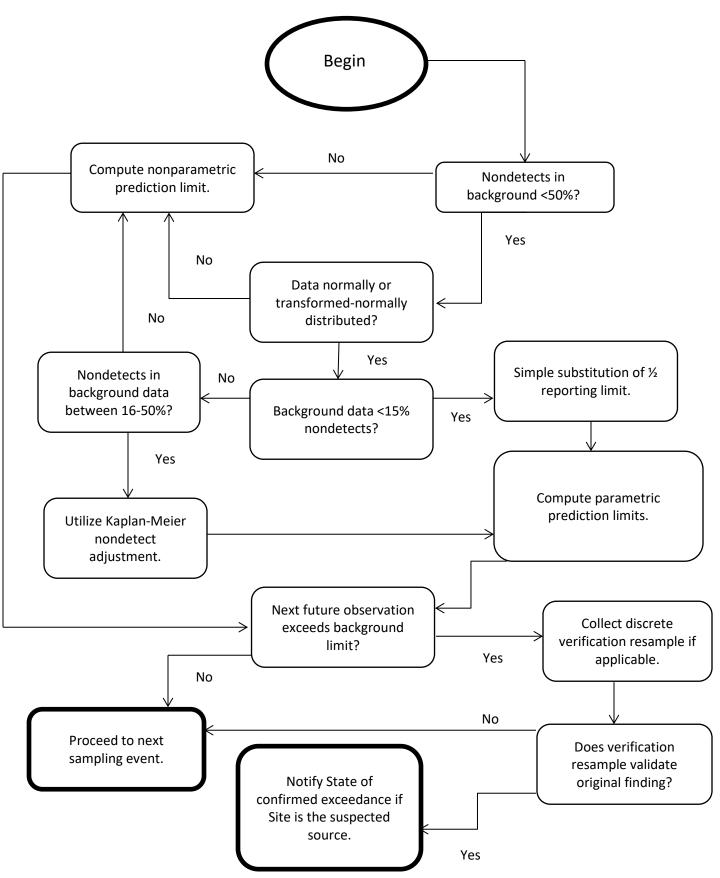


FIGURE 2. DECISION LOGIC FOR COMPUTING PREDICTION LIMITS



### **APPENDICES**

**APPENDIX A. MONITORING SYSTEM DETAILS** 

APPENDIX B. HYDRAULIC CONDUCTIVITY TESTING RESULTS

APPENDIX C. BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

APPENDIX D. GROUNDWATER MONITORING WELL DETAIL

APPENDIX E. GROUNDWATER SAMPLING PROCEDURES

### APPENDIX A. MONITORING SYSTEM DETAILS

TABLE 1
GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

		J.(J.	JIVOVATER		WELL CONSTITU	CITON DETAILS		Horizontal	Vertical
		Total	Top of	Screen	Depth to	September 2020		Hydraulic	Hydraulic
Upgradient	Hydraulic	Depth	Casing	Interval	Groundwater	Groundwater	Screened	Conductivity	Conductivity
Monitoring Well ID	Location	(ft BTOC)	(ft)	Elevation (ft)	(ft BTOC)	Elevation (ft)	Lithology	(cm/sec)	(cm/sec)
GWA-2	Upgradient	52.02	805.62	763.8 - 753.8	34.98	770.64	PWR	1.46E-03	n/a
YGWA-1I	Upgradient	53.60	836.60	793.3 - 783.3	36.71	799.89	PWR	1.80E-04	n/a
YGWA-1D	Upgradient	128.85	837.25	759.2 - 709.2	48.22	789.03	Bedrock	6.17E-05	n/a
YGWA-2I	Upgradient	63.75	866.25	812.8 - 802.8	44.18	822.07	PWR	3.53E-06	n/a
YGWA-3I	Upgradient	59.05	796.55	747.7 - 737.7	53.32	743.23	PWR	1.16E-04	n/a
YGWA-3D	Upgradient	134.18	796.78	712.9 - 662.9	23.41	773.37	Bedrock	4.90E-04	n/a
YGWA-4I	Upgradient	48.81	784.21	745.7 - 735.7	23.45	760.76	PWR	8.55E-05	n/a
YGWA-5I	Upgradient	58.94	784.54	735.9 - 725.9	19.82	764.72	PWR	2.90E-04	n/a
YGWA-5D	Upgradient	129.13	784.53	706.0 - 656.0	22.51	762.02	Bedrock	1.11E-04	n/a
YGWA-14S	Upgradient	34.96	748.76	724.1 - 714.1	17.37	731.39	Saprolite	4.94E-04	n/a
YGWA-17S	Upgradient	39.85	783.05	753.2 - 743.2	12.62	770.43	Saprolite	3.46E-04	6.91E-04
YGWA-18S	Upgradient	39.97	790.57	760.9 - 750.9	20.39	770.18	Saprolite	1.06E-04	n/a
YGWA-18I	Upgradient	79.97	790.57	720.9 - 710.9	23.59	766.98	PWR	6.42E-04	n/a
YGWA-20S	Upgradient	29.52	767.12	747.9 - 737.9	11.44	755.68	Saprolite	2.93E-04	9.72E-05
YGWA-21I	Upgradient	79.90	783.70	714.1 - 704.1	31.29	752.41	PWR	2.20E-05	n/a
YGWA-30I	Upgradient	59.48	762.58	713.4 - 703.4	48.47	714.11	PWR	2.27E-03	n/a
YGWA-39	Upgradient	68.59	818.19	760.1 - 750.1	21.81	796.38	PWR	1.85E-03	n/a
YGWA-40	Upgradient	48.23	815.73	778.0 - 768.0	25.44	790.29	PWR	6.50E-04	n/a
YGWA-47	Upgradient	59.19	758.22	709.6 - 699.6	33.38	724.84	PWR	8.04E-04	n/a
YGWC-23S	Downgradient	38.91	764.91	735.2 - 725.2	17.61	747.44	Saprolite	2.22E-04	n/a
YGWC-24SA	Downgradient	57.00	765.00	718.0 - 708.0	28.77	736.23	Saprolite	n/a	n/a
YGWC-36A	Downgradient	51.20	740.88	698.9 - 688.9	7.30	733.58	PWR	n/a	n/a
YGWC-38	Downgradient	49.59	799.69	760.1 - 750.1	29.82	768.78	Bedrock	1.91E-04	n/a
YGWC-41	Downgradient	66.82	803.92	747.1 - 737.1	26.91	777.01	Bedrock	5.79E-04	n/a
YGWC-42	Downgradient	59.76	797.86	748.5 - 738.5	27.48	770.38	Bedrock	1.84E-04	n/a
YGWC-43	Downgradient	79.66	744.96	676.8 - 666.8	15.11	729.85	Bedrock	3.14E-03	n/a
YGWC-49	Downgradient	78.53	782.73	714.7 - 704.7	31.00	751.73	PWR	7.46E-04	n/a
YGWC-50 (Proposed)	Downgradient	TBD	TBD	TBD	TBD	n/a	TBD	n/a	n/a

#### Notes

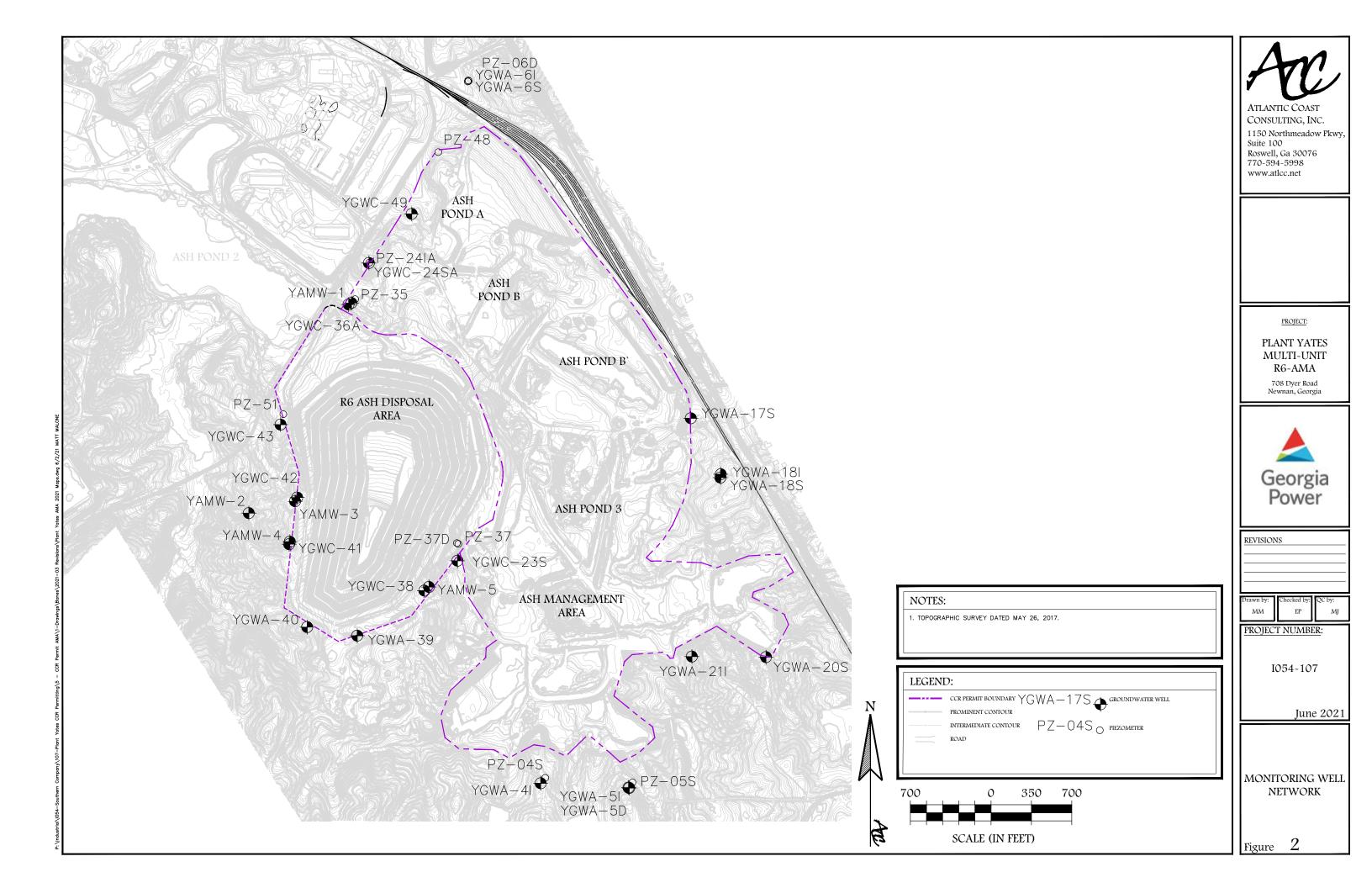
ft BTOC = feet below top of casing; cm/sec = centimeters per second

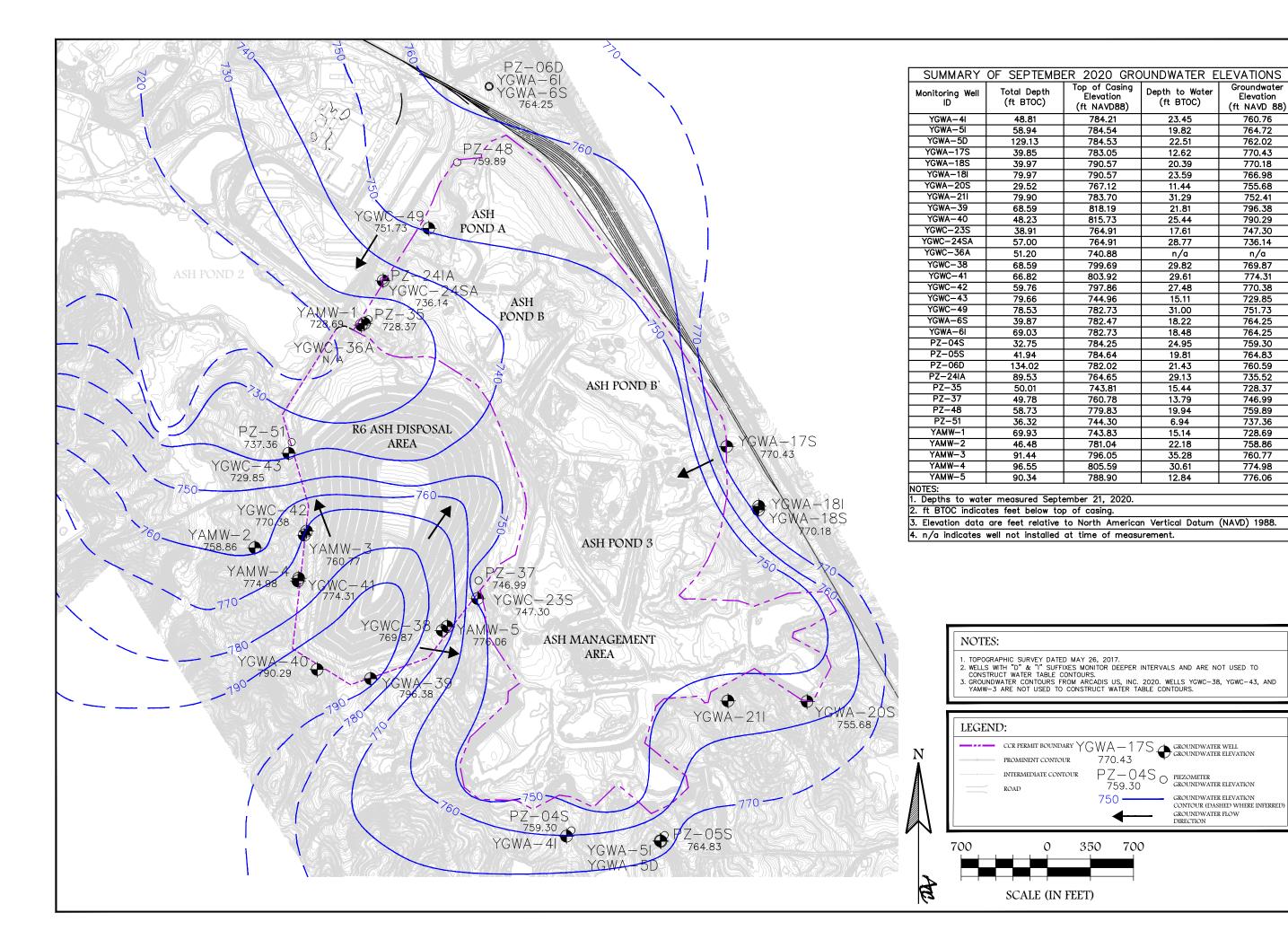
Elevation in U.S. Survey Feet (NAVD88) based on June 2020 survey.

PWR = Partially Weathered Rock

TBD = to be determined

n/a = not applicable





ACC

ATLANTIC COAST CONSULTING, INC.

1150 Northmeadow Pkwy, Suite 100 Roswell, Ga 30076 770-594-5998 www.atlcc.net

PROJECT:

PLANT YATES MULTI-UNIT R6-AMA

708 Dyer Road Newnan, Georgia



REVISIONS

Drawn by: MM

PROJECT NUMBER:

I054~107

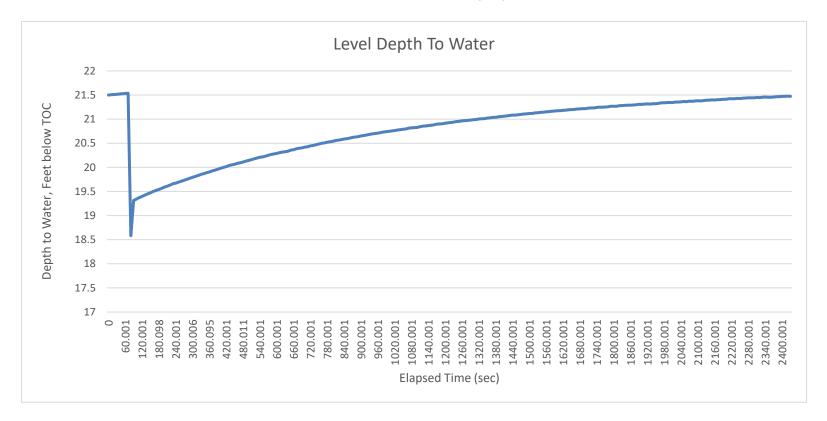
May 2021

SEPTEMBER 2020 POTENTIOMETRIC SURFACE CONTOUR MAP

Figure 2

### APPENDIX B. HYDRAULIC CONDUCTIVITY TESTING RESULTS

## PZ-4i Test 1 (in)



Log Configuration							
Log Name	PZ-04 I						
Created By	X2WSHAUG						
Computer Name	X2WSHAUGH						
Application	WinSitu.exe						
Application Version	5.6.25.0						
Create Date	7/10/14 10:00 AM						
Log Setup Time Zone	Central Daylight Time						
Notes Size(bytes)	4096						
Overwrite when full	Disabled						
Scheduled Start Time	Manual Start						
Scheduled Stop Time	No Stop Time						
Туре	Fast Linear						

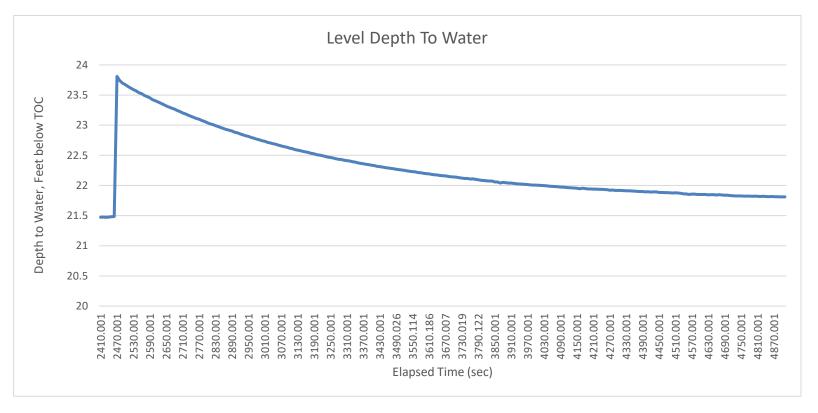
Other Log Settings					
Depth of Probe:	18.9311 (ft)				
Head Pressure:	8.19895 (PSI)				
Temperature:	60.3496 (F)				

Level Reference Settings At Log Creation						
Level Measurement Mode	Level Depth To Water					
Specific Gravity	0.999					
Level Reference Mode:	Set new reference					
Level Reference Value:	84					
Level Reference Head Pressure	23					

Device Properties					
Device	Level TROLL 500				
Site	Plant Yates				
Device Name					
Serial Number	160731				
Firmware Version	2.04				
Hardware Version	3				
Device Address	1				
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)				
Used Memory(%)	21.45 (ft)				
Used Battery(%)	8.19992 (PSI)				

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
0	21.499	450	20.067	900	20.652	1350	21.023	1800	21.267
10	21.507	460	20.084	910	20.662	1360	21.028	1810	21.266
20	21.511	470	20.097	920	20.672	1370	21.038	1820	21.278
30	21.516	480	20.112	930	20.684	1380	21.039	1830	21.282
40	21.521	490	20.130		20.694	1390	21.049	1840	21.284
50	21.528	500	20.147	950	20.703	1400	21.055	1850	21.290
60	21.534	510	20.160	960	20.711	1410	21.060	1860	21.288
70	21.536	520	20.180		20.721	1420	21.069	1870	21.293
80	18.583	530	20.195	980	20.733	1430	21.076	1880	21.299
90	19.315	540	20.209	990	20.741	1440	21.083	1890	21.307
100	19.344	550	20.219		20.749	1450	21.085	1900	21.306
110	19.373	560	20.232	1010	20.755	1460	21.091	1910	21.312
120	19.398	570	20.253		20.765		21.099	1920	21.315
130	19.424	580	20.266		20.774	1480	21.106	1930	21.314
140	19.450	590	20.279		20.783	1490	21.111	1940	21.319
150 160	19.475 19.499	600 610	20.292	1050 1060	20.791 20.798	1500 1510	21.117 21.119	1950 1960	21.321 21.329
170	19.499	620	20.303		20.798	1510	21.119	1960	21.338
180	19.523	630	20.316		20.811	1530	21.129	1970	21.339
190	19.566	640	20.335	1090	20.819	1540	21.133		21.344
200	19.592	650	20.359		20.829	1550	21.140		21.347
210	19.611	660	20.368		20.823	1560	21.151	2010	21.343
220	19.635	670	20.387	1120	20.853	1570	21.155		21.353
230	19.659	680	20.398		20.857	1580	21.164		21.356
240	19.673	690	20.405	1140	20.866	1590	21.167	2040	21.359
250	19.694	700	20.421	1150	20.875		21.174	2050	21.365
260	19.714	710	20.428		20.882	1610	21.174	2060	21.362
270	19.735	720	20.446		20.896	1620	21.182	2070	21.372
280	19.753		20.456				21.188		
290	19.774	740	20.468			1640	21.195		21.378
300	19.796	750	20.485	1200	20.916	1650	21.197	2100	21.382
310	19.814	760	20.500	1210	20.924	1660	21.203	2110	21.379
320	19.832	770	20.508	1220	20.932	1670	21.210	2120	21.386
330	19.854	780	20.522	1230	20.940	1680	21.213	2130	21.391
340	19.872	790	20.531	1240	20.950	1690	21.216	2140	21.394
350	19.891	800	20.543	1250	20.953	1700	21.217	2150	21.400
360	19.906	810	20.559	1260	20.964	1710	21.227	2160	21.397
370	19.927	820	20.566	1270	20.968	1720	21.231	2170	21.405
380	19.945	830	20.576	1280	20.972	1730	21.234	2180	21.403
390	19.964	840	20.587	1290	20.981	1740	21.244	2190	21.413
400	19.980	850	20.596	1300	20.989	1750	21.247	2200	21.411
410	20.000	860	20.606	1310	20.994	1760	21.247	2210	21.422
420	20.016	870	20.621	1320	21.002	1770	21.251	2220	21.422
430	20.039	880	20.629				21.255		
440	20.055	890	20.637	1340	21.012	1790	21.265	2240	21.430

## PZ-4i Test 1 (out)



Log Configuration						
Log Name	PZ-04 I					
Created By	X2WSHAUG					
Computer Name	X2WSHAUGH					
Application	WinSitu.exe					
Application Version	5.6.25.0					
Create Date	7/10/14 10:00 AM					
Log Setup Time Zone	Central Daylight Time					
Notes Size(bytes)	4096					
Overwrite when full	Disabled					
Scheduled Start Time	Manual Start					
Scheduled Stop Time	No Stop Time					
Туре	Fast Linear					

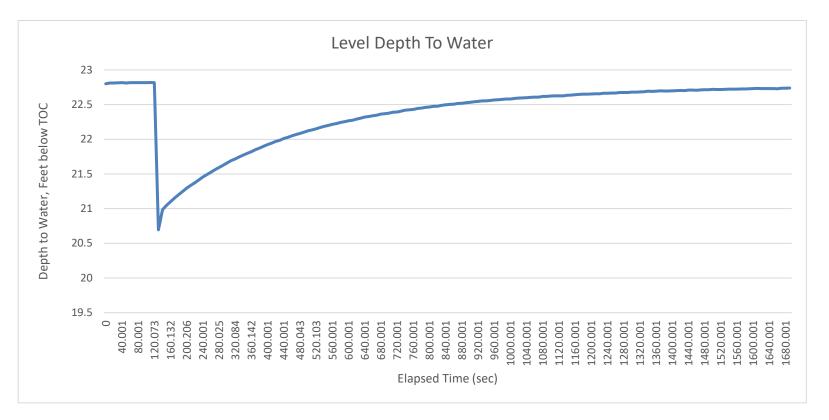
Other Log Settings					
Depth of Probe:	18.9311 (ft)				
Head Pressure:	8.19895 (PSI)				
Temperature:	60.3496 (F)				

Level Reference Settings At Log Creation						
Level Measurement Mode	Level Depth To Water					
Specific Gravity	0.999					
Level Reference Mode:	Set new reference					
Level Reference Value:	21.45 (ft)					
Level Reference Head Pressure	8.19992 (PSI)					

Device Properties					
Device	Level TROLL 500				
Site Plant Yates					
Device Name					
Serial Number	160731				
Firmware Version	2.04				
Hardware Version	3				
Device Address	1				
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)				
Used Memory(%)	84				
Used Battery(%)	23				

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
2400		2850	22.958	3300	22.42	3750	22.118	4200	21.943
2410	21.473	2860	22.945	3310	22.413	3760	22.108	4210	21.94
2420	21.477	2870	22.928	3320	22.405	3770	22.109	4220	21.94
2430	21.472	2880	22.915	3330	22.394	3780	22.102	4230	21.935
2440	21.476	2890	22.904	3340	22.387	3790	22.094	4240	
2450	21.483	2900	22.882	3350	22.375	3800	22.087	4250	
2460	21.486	2910	22.873	3360	22.367	3810	22.082	4260	21.929
2470	23.809	2920	22.856		22.36		22.076		
2480	23.739	2930	22.839	3380	22.351	3830	22.073	4280	
2490 2500	23.697	2940 2950	22.825	3390	22.345	3840	22.073	4290 4300	
2510	23.672 23.641	2960	22.815 22.798	3400 3410	22.336 22.329	3850 3860	22.06 22.058	4310	21.918 21.917
2510	23.614	2970	22.786	3420	22.329	3870	22.038	4310	
2530	23.591	2980	22.77	3430	22.313	3880	22.053	4320	21.912
2540	23.569	2990	22.756	3440	22.306	3890	22.047	4340	21.911
2550	23.54	3000	22.741	3450	22.298	3900	22.039	4350	21.909
2560	23.523	3010	22.732	3460	22.29	3910	22.039	4360	21.906
2570	23.493	3020	22.716	3470	22.283	3920	22.035	4370	
2580	23.476	3030	22.704	3480	22.277	3930	22.028	4380	21.9
2590	23.453	3040	22.692	3490	22.27	3940	22.025	4390	21.9
2600	23.424	3050	22.685	3500	22.263	3950	22.023	4400	21.895
2610	23.404	3060	22.67	3510	22.256	3960	22.019	4410	21.896
2620	23.385	3070	22.656	3520	22.25	3970	22.017	4420	21.891
2630	23.365	3080	22.643	3530	22.243	3980	22.01	4430	21.893
2640	23.343	3090	22.634	3540	22.237	3990	22.008	4440	21.893
2650	23.32	3100	22.619	3550	22.229	4000	22.008	4450	
2660	23.3	3110	22.611	3560	22.226	4010	22.004	4460	21.885
2670	23.282	3120	22.597	3570	22.215	4020	21.999	4470	21.88
2680	23.268		22.585		22.21		21.996		
2690	23.243	3140	22.577	3590	22.203	4040	21.994	4490	
2700	23.227	3150	22.566		22.196		21.988		
2710 2720	23.203 23.187	3160 3170	22.557 22.547	3610	22.192 22.185	4060 4070	21.985 21.981	4510 4520	
2720	23.167	3170	22.547	3620 3630	22.185	4070	21.981		
2730	23.147	3190	22.535		22.179		21.978		
2750	23.147	3200	22.511		22.175		21.974		
2760	23.112	3210	22.503	3660	22.162	4110	21.968		
2770	23.099	3220	22.496		22.16		21.965	4570	
2780	23.078	3230	22.484	3680	22.151	4130	21.961	4580	
2790	23.062	3240	22.472	3690	22.143	4140	21.958		
2800	23.042	3250	22.463		22.142		21.956		
2810	23.024	3260	22.454		22.139		21.946		
2820	23.01	3270	22.444	3720	22.128	4170	21.954	4620	21.85
2830	22.992	3280	22.434	3730	22.122	4180	21.95	4630	21.846
2840	22.977	3290	22.43	3740	22.118	4190	21.944	4640	21.847

## PZ-4s Test 1 (in)



Log Configuration					
Log Name	PZ-04 S				
Created By	X2WSHAUG				
Computer Name	X2WSHAUGH				
Application	WinSitu.exe				
Application Version	5.6.25.0				
Create Date	7/10/14 9:01 AM				
Log Setup Time Zone	Central Daylight Time				
Notes Size(bytes)	4096				
Overwrite when full	Disabled				
Scheduled Start Time	Manual Start				
Scheduled Stop Time	No Stop Time				
Туре	Fast Linear				

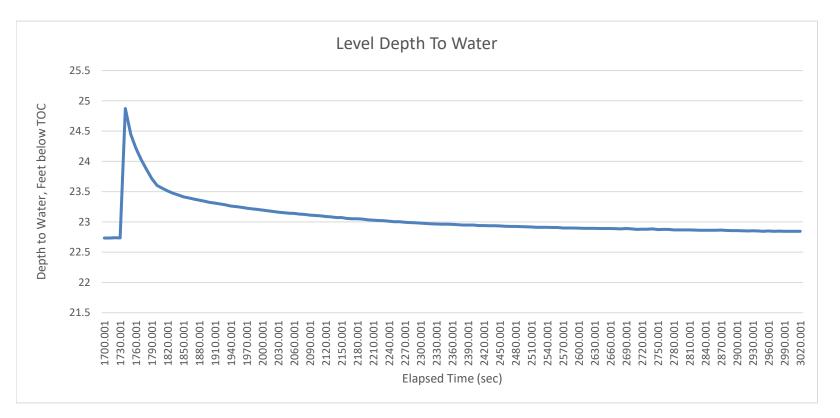
Other Log Settings					
Depth of Probe:	9.73925 (ft)				
Head Pressure:	4.21801 (PSI)				
Temperature:	60.8266 (F)				

Level Reference Settings At Log Creation						
Level Measurement Mode	Level Depth To Water					
Specific Gravity	0.999					
Level Reference Mode:	Set new reference					
Level Reference Value:	22.74 (ft)?					
Level Reference Head Pressure	4.21807 (PSI)					

Device Properties					
Device	Level TROLL 500				
Site	Plant Yates				
Device Name					
Serial Number	160731				
Firmware Version	2.04				
Hardware Version	3				
Device Address	1				
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)				
Used Memory(%)	81				
Used Battery(%)	23				

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
0	22.802	450	22.029	900	22.532	1350	22.692		
10	22.812	460	22.050	910	22.541	1360	22.694		
20	22.813	470	22.070	920	22.545	1370	22.698		
30	22.814	480	22.086	930	22.553	1380	22.696		
40	22.818	490	22.104	940	22.553	1390	22.697		
50	22.813	500	22.123	950	22.560	1400	22.700		
60	22.816	510	22.135	960	22.567	1410	22.703		
70	22.817	520	22.153	970	22.571	1420	22.705		
80	22.817	530	22.170				22.702		
90	22.816	540	22.186	990		1440	22.710		
100	22.818	550	22.201	1000	22.581	1450	22.710		
110	22.819	560	22.216			1460	22.708		
120	22.818	570	22.228	1020	22.594	1470	22.712		
130	20.695	580	22.242	1030	22.596	1480	22.716		
140	20.985	590	22.255	1040		1490	22.716		
150	21.046	600	22.268	1050		1500	22.721		
160	21.101	610	22.275	1060		1510	22.718		
170	21.154	620	22.292	1070	22.607	1520	22.718		
180	21.202	630	22.304	1080	22.618	1530	22.721		
190	21.249	640	22.320	1090	22.619	1540	22.722		
200	21.295	650	22.330	1100	22.624	1550	22.723		
210	21.336	660	22.340	1110	22.627	1560	22.724		
220	21.375	670	22.347	1120	22.628	1570	22.725		
230	21.415	680	22.363	1130	22.628	1580	22.725		
240	21.457	690	22.370			1590	22.729		
250	21.492	700	22.377	1150		1600	22.730		
260	21.528	710	22.390			1610	22.735		
270	21.563	720	22.394	1170		1620	22.732		
280	21.595		22.407				22.732		
290	21.626	740	22.420				22.732		
300	21.660		22.426				22.732		
310	21.692	760	22.432				22.729		
320	21.717	770	22.445	1220			22.736		
330	21.746	780	22.451	1230			22.736		
340	21.773	790	22.461			1690	22.739		
350	21.799	800	22.466						
360	21.823	810	22.476						
370	21.851	820	22.476						
380	21.874	830	22.490						
390	21.901	840	22.497						
400	21.924	850	22.502	1300					
410	21.945	860	22.507	1310					
420	21.970	870	22.518						
430	21.986	880	22.519						
440	22.013	890	22.528	1340	22.694				

## PZ-4s Test 1 (out)



Log Configuration						
Log Name	PZ-04 S					
Created By	X2WSHAUG					
Computer Name	X2WSHAUGH					
Application	WinSitu.exe					
Application Version	5.6.25.0					
Create Date	7/10/14 9:01 AM					
Log Setup Time Zone	Central Daylight Time					
Notes Size(bytes)	4096					
Overwrite when full	Disabled					
Scheduled Start Time	Manual Start					
Scheduled Stop Time	No Stop Time					
Туре	Fast Linear					

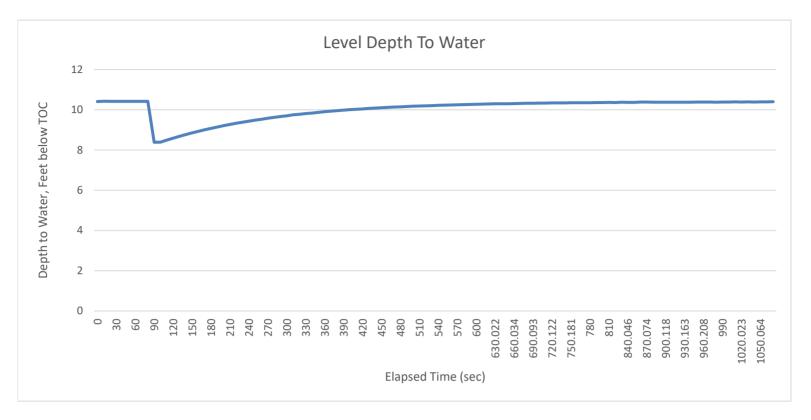
Other Log Settings						
Depth of Probe: 9.73925 (ft)						
Head Pressure:	4.21801 (PSI)					
Temperature:	60.8266 (F)					

Level Reference Settings At Log Creation					
Level Measurement Mode Level Depth To Wa					
Specific Gravity	0.999				
Level Reference Mode:	Set new reference				
Level Reference Value:	22.74 (ft) <sup>2</sup>				
Level Reference Head Pressure	4.21807 (PSI)				

Device Properties				
Device	Level TROLL 500			
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version	3			
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	81			
Used Battery(%)	23			

1690 1700 1710 1720 1730 1740 1750 1760 1770 1780	22.734 22.734 22.739 22.735 24.873 24.448	2140 2150 2160 2170 2180	23.073 23.071 23.059 23.051	2600	22.901		
1710 1720 1730 1740 1750 1760	22.734 22.739 22.735 24.873 24.448	2160 2170 2180	23.059				
1720 1730 1740 1750 1760 1770	22.739 22.735 24.873 24.448	2170 2180			22.897		
1730 1740 1750 1760 1770	22.735 24.873 24.448	2180	22 NE 1	2610	22.894		
1740 1750 1760 1770	24.873 24.448		25.051	2620	22.895		
1750 1760 1770	24.448		23.051	2630	22.893		
1760 1770		2190	23.046	2640	22.891		
1770		2200	23.034	2650	22.89		
	24.215	2210	23.03	2660	22.891		
1780	24.028	2220	23.024	2670	22.889		
	23.864	2230	23.019	2680	22.885		
1790	23.717	2240	23.013	2690	22.89		
1800	23.604	2250	23.003	2700	22.884		
1810	23.555	2260	23.003	2710	22.878		
1820	23.513	2270	22.994	2720	22.88		
1830	23.474	2280	22.988	2730	22.88		
1840	23.445	2290	22.987	2740	22.885		
1850	23.415	2300	22.981	2750	22.874		
1860	23.398	2310	22.975	2760	22.877		
1870	23.377	2320	22.968	2770	22.876		
1880	23.359	2330	22.967	2780	22.868		
1890	23.342	2340	22.964	2790	22.869		
1900	23.323	2350	22.963	2800	22.868		
1910	23.311	2360	22.959	2810	22.869		
1920	23.296	2370	22.955	2820	22.865		
1930	23.281	2380	22.949	2830	22.863		
1940	23.263	2390	22.949	2840	22.863		
1950	23.254	2400	22.949	2850	22.861		
1960	23.242	2410	22.94	2860	22.861		
1970	23.228	2420	22.94	2870	22.864		
1980	23.216	2430	22.937	2880	22.859		
1990	23.206	2440	22.936	2890	22.856		
2000	23.196	2450	22.933	2900	22.857		
2010	23.183	2460	22.928		22.855		
2020	23.173	2470	22.926		22.851		
2030	23.162	2480	22.926		22.853		
2040	23.154	2490	22.924	2940	22.851		
2050	23.144	2500	22.92	2950	22.846		
2060	23.142	2510	22.917	2960	22.85		
2070	23.129	2520	22.911	2970	22.846		
2080	23.124	2530	22.911	2980	22.847		
2090	23.113	2540	22.91	2990	22.844		
2100	23.106	2550	22.908	3000	22.845		
2110	23.101	2560	22.909	3010	22.846		
2120	23.089	2570	22.90	3020	22.844		
2130	23.085	2580	22.9		22.044		

# PZ-5d Test 1 (in)



Log Configuration					
Log Name	PZ-05 D				
Created By	X2WSHAUG				
Computer Name	X2WSHAUGH				
Application	WinSitu.exe				
Application Version	5.6.25.0				
Create Date	7/10/14 1:15 PM				
Log Setup Time Zone	Central Daylight Time				
Notes Size(bytes)	4096				
Overwrite when full	Disabled				
Scheduled Start Time	Manual Start				
Scheduled Stop Time	No Stop Time				
Туре	Fast Linear				

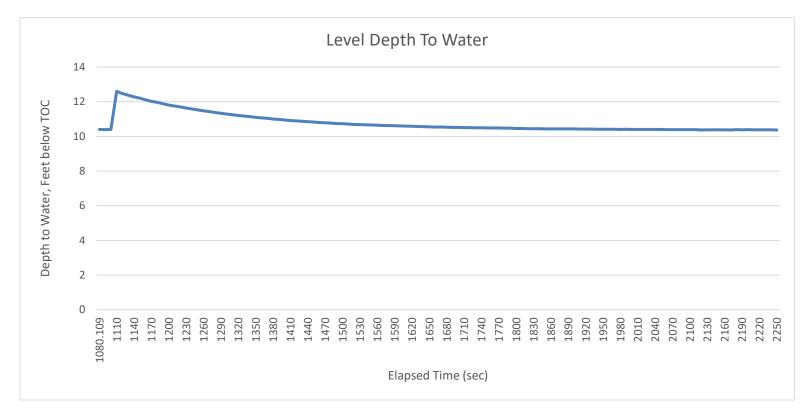
Other Log Settings					
Depth of Probe:	43.0264 (ft)				
Head Pressure:	18.6345 (PSI)				
Temperature:	62.0456 (F)				

Level Reference Settings At Log Creation					
Level Measurement Mode	Level Depth To Water				
Specific Gravity	0.999				
Level Reference Mode:	Set new reference				
Level Reference Value:	10.43 (ft)				
Level Reference Head Pressure	18.6373 (PSI)				

Device Properties				
Device Level TROLL 500				
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version	3			
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	93			
Used Battery(%)	23			

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
0	10.412	450	10.104	900	10.378				
10	10.425	460	10.120	910	10.379				
20	10.422	470	10.134	920	10.378				
30	10.423	480	10.149	930	10.378				
40	10.422	490	10.164	940	10.381				
50	10.422	500	10.176	950	10.382				
60	10.422	510	10.187	960	10.383				
70	10.421	520	10.201	970	10.383				
80	10.416	530	10.210	980	10.381				
90	8.385	540	10.221	990	10.387				
100	8.391	550	10.232	1000	10.384				
110	8.492	560	10.242	1010	10.393				
120	8.590	570	10.251	1020	10.389				
130	8.683	580	10.259	1030	10.398				
140	8.772	590	10.269	1040	10.389				
150	8.854	600	10.276	1050	10.396				
160	8.932	610	10.283	1060	10.397				
170	9.008	620	10.288	1070	10.400				
180	9.079	630	10.297						
190	9.146	640	10.301						
200	9.210	650	10.304						
210	9.270	660	10.312						
220	9.330	670	10.317						
230	9.386	680	10.324						
240	9.438	690	10.326						
250	9.487	700	10.330						
260	9.533	710	10.336						
270	9.584	720	10.339						
280	9.622	730	10.342						
290	9.667	740	10.346						
300	9.704	750	10.348						
310	9.750	760	10.350						
320	9.775	770	10.353						
330	9.810	780	10.353						
340	9.841	790	10.360						
350	9.874	800	10.358						
360	9.903	810	10.369						
370	9.928	820	10.362						
380	9.955	830	10.375						
390	9.981	840	10.367						
400	10.007	850	10.367						
410	10.026	860	10.383						
420	10.046	870	10.382						
430	10.068	880	10.375						
440	10.086	890	10.378						

# PZ-5d Test 1 (out)



Log Configuration					
Log Name	PZ-05 D				
Created By	X2WSHAUG				
Computer Name	X2WSHAUGH				
Application	WinSitu.exe				
Application Version	5.6.25.0				
Create Date	7/10/14 1:15 PM				
Log Setup Time Zone	Central Daylight Time				
Notes Size(bytes)	4096				
Overwrite when full	Disabled				
Scheduled Start Time	Manual Start				
Scheduled Stop Time	No Stop Time				
Type	Fast Linear				

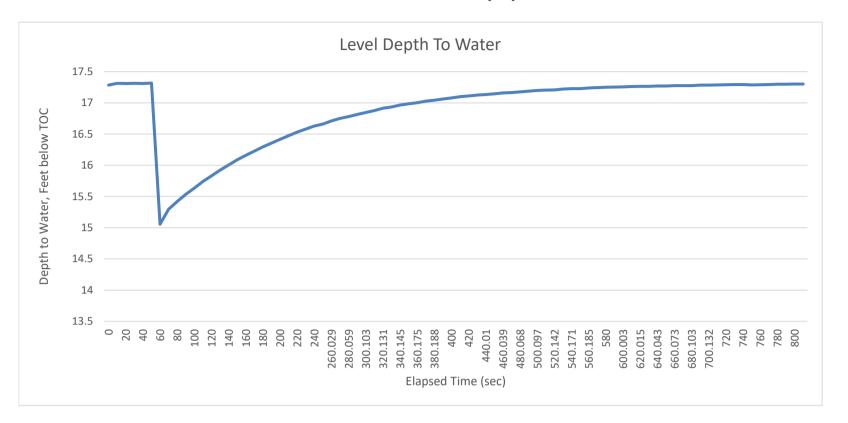
Other Log Settings					
Depth of Probe:	43.0264 (ft)				
Head Pressure:	18.6345 (PSI)				
Temperature:	62.0456 (F)				

Level Reference Settings At Log Creation					
Level Measurement Mode Level Depth To Water					
Specific Gravity	0.999				
Level Reference Mode:	Set new reference				
Level Reference Value:	10.43 (ft)				
Level Reference Head Pressure	18.6373 (PSI)				

Device Properties				
Device	Level TROLL 500			
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version	3			
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	93			
Used Battery(%)	23			

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
20		470		920		1370	11.043	1820	10.45
30		480		930		1380	11.009	1830	10.444
40		490		940		1390	10.98	1840	10.443
50		500		950		1400	10.951	1850	10.439
60		510		960		1410	10.923	1860	10.437
70		520		970		1420	10.897	1870	10.431
80		530		980		1430	10.874	1880	10.437
90		540		990		1440	10.85	1890	10.434
100		550		1000		1450	10.828	1900	10.433
110		560		1010		1460	10.804	1910	10.423
120 130		570 580		1020 1030		1470 1480	10.788 10.77	1920 1930	10.423 10.42
140		590		1030		1490	10.77	1930	10.42
150		600		1040		1500	10.731	1940	10.418
160		610		1060		1510	10.738	1960	10.418
170		620		1070		1520	10.698	1970	10.414
180		630		1080	10.401	1530	10.688	1980	10.409
190		640		1090	10.394	1540	10.676	1990	10.411
200		650		1100	10.402	1550	10.662	2000	10.407
210		660		1110	12.599	1560	10.646	2010	10.404
220		670		1120	12.472	1570	10.634	2020	10.404
230		680		1130	12.373	1580	10.624	2030	10.402
240		690		1140	12.284	1590	10.615	2040	10.399
250		700		1150	12.203	1600	10.606	2050	10.399
260		710		1160	12.114	1610	10.595	2060	10.396
270		720		1170	12.026	1620	10.585	2070	10.395
280		730		1180	11.97	1630	10.576	2080	10.39
290		740		1190	11.885	1640	10.566	2090	10.392
300		750		1200	11.808	1650	10.556	2100	10.388
310		760		1210	11.759	1660	10.547	2110	10.389
320		770		1220	11.699	1670	10.541	2120	10.375
330		780		1230	11.641	1680	10.53	2130	10.382
340		790		1240	11.587	1690	10.526	2140	10.384
350		800		1250	11.53	1700	10.52	2150	10.383
360		810		1260	11.477	1710	10.511	2160	10.381
370		820		1270	11.429	1720	10.507	2170	10.375
380		830		1280	11.382	1730	10.502	2180	10.388
390		840		1290	11.334		10.495	2190	10.383
400		850		1300	11.294		10.49		10.391
410		860		1310	11.25		10.489		10.385
420		870		1320	11.21	1770			10.377
430		880		1330	11.177	1780	10.482	2230	10.378
440		890		1340	11.14				10.379
450		900		1350	11.106		10.455	2250	10.376
460		910		1360	11.071	1810	10.455	2260	

# PZ-5i Test 1 (in)



Log Configuration					
Log Name	PZ-05 I				
Created By	X2WSHAUG				
Computer Name	X2WSHAUGH				
Application	WinSitu.exe				
Application Version	5.6.25.0				
Create Date	7/10/14 12:26 PM				
Log Setup Time Zone	Central Daylight Time				
Notes Size(bytes)	4096				
Overwrite when full	Disabled				
Scheduled Start Time	Manual Start				
Scheduled Stop Time	No Stop Time				
Туре	Fast Linear				

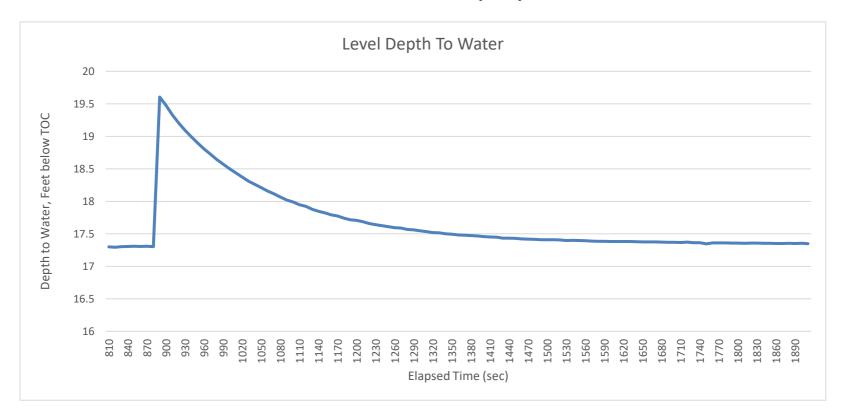
Other Log Settings					
Depth of Probe:	30.4527 (ft)				
Head Pressure:	13.1889 (PSI)				
Temperature:	61.7533 (F)				

Level Reference Settings At Log Creation				
Level Measurement Mode Level Depth To Water				
Specific Gravity	0.999			
Level Reference Mode:	Set new reference			
Level Reference Value:	17.31 (ft)			
Level Reference Head Pressure	13.1886 (PSI)			

Device Properties				
Device Level TROLL 500				
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version	3			
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	90			
Used Battery(%)	23			

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
0	17.284	450	17.146						
10	17.312	460	17.159						
20	17.311	470	17.165						
30	17.313	480	17.177						
40	17.311	490	17.188						
50	17.317	500	17.198						
60	15.056	510	17.206						
70	15.297	520	17.207						
80	15.421	530	17.221						
90	15.534	540	17.227						
100	15.636	550	17.226						
110	15.740	560	17.238						
120	15.833	570	17.245						
130	15.922	580	17.251						
140	16.005	590	17.252						
150	16.088	600	17.255						
160	16.158	610	17.262						
170	16.229	620	17.264						
180	16.295	630	17.265						
190	16.357	640	17.270						
200	16.417	650	17.271						
210	16.475	660	17.275						
220	16.532	670	17.275						
230	16.580	680	17.277						
240	16.628	690	17.285						
250	16.661	700	17.285						
260	16.711	710	17.286						
270	16.751	720	17.290						
280	16.780		17.292						
290	16.815		17.294						
300	16.847	750	17.286						
310	16.876		17.291						
320	16.914		17.292						
330	16.934		17.298						
340	16.965		17.299						
350	16.985	-	17.302						
360	17.002		17.301						
370	17.028								
380	17.041								
390	17.062								
400	17.079								
410	17.098								
420	17.110	-							
430	17.125	-							
440	17.133								

# PZ-5i Test 1 (out)



Log Configuration				
Log Name	PZ-05 I			
Created By	X2WSHAUG			
Computer Name	X2WSHAUGH			
Application	WinSitu.exe			
Application Version	5.6.25.0			
Create Date	7/10/14 12:26 PM			
Log Setup Time Zone	Central Daylight Time			
Notes Size(bytes)	4096			
Overwrite when full	Disabled			
Scheduled Start Time	Manual Start			
Scheduled Stop Time	No Stop Time			
Туре	Fast Linear			

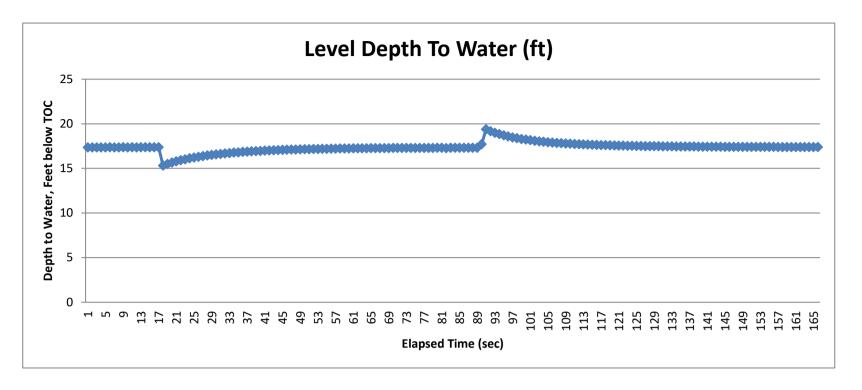
Other Log Settings			
Depth of Probe:	30.4527 (ft)		
Head Pressure:	13.1889 (PSI)		
Temperature:	61.7533 (F)		

Level Reference Settings At Log Creation				
Level Measurement Mode	Level Depth To Water			
Specific Gravity	0.999			
Level Reference Mode:	Set new reference			
Level Reference Value:	17.31 (ft)			
Level Reference Head Pressure	13.1886 (PSI)			

Device Properties				
Device	Level TROLL 500			
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version 3				
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	90			
Used Battery(%)	23			

Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)	Elapsed Time (sec)	Level Depth To Water (ft)
0		450		900	19.476	1350	17.493	1800	17.357
10		460		910	19.33	1360	17.483	1810	17.356
20		470		920	19.204	1370	17.478	1820	17.357
30		480		930	19.091	1380	17.473	1830	17.357
40		490		940	18.99	1390	17.467	1840	17.356
50		500		950	18.894	1400	17.459	1850	17.355
60		510		960	18.805	1410	17.452	1860	17.353
70		520		970	18.724	1420	17.448	1870	17.353
80		530		980	18.644	1430	17.435	1880	17.355
90		540		990	18.569	1440	17.433	1890	17.351
100		550		1000	18.5	1450	17.43	1900	17.354
110		560		1010	18.438	1460	17.423	1910	17.349
120		570		1020	18.372	1470	17.418		
130		580		1030	18.309	1480	17.415		
140		590		1040	18.26	1490	17.41		
150		600		1050	18.209	1500	17.41		
160		610		1060	18.158	1510	17.409		
170		620		1070	18.113	1520	17.406		
180		630		1080	18.067	1530	17.396		
190		640		1090	18.02	1540	17.4		
200		650		1100	17.989	1550	17.396		
210		660		1110	17.946	1560	17.395		
220		670		1120	17.924	1570	17.389		
230		680		1130	17.878	1580	17.386		
240		690		1140	17.846	1590	17.386		
250		700		1150	17.824	1600	17.382		
260		710		1160	17.792	1610	17.382		
270		720		1170	17.774	1620	17.382		
280		730		1180			17.382		
290		740		1190 1200			17.38		
300 310		750 760		1200	17.706 17.685		17.376 17.376		
320		770		1210			17.375		
330		770		1230			17.373		
340		790		1240		1690	17.369		
350		800		1250		1700	17.371		
360		810	17.301	1260			17.368		
370		820	17.294				17.372		
380		830	17.303		17.567	1720	17.365		
390		840	17.307				17.363		
400		850	17.308		17.545	1750	17.346		
410		860	17.306				17.362		
420		870	17.308				17.362		
430		880	17.302				17.36		
440		890	19.605			1790	17.358		

**PZ-05 S** 



Log Configuration				
Log Name	PZ-05 S			
Created By	X2WSHAUG			
Computer Name	X2WSHAUGH			
Application	WinSitu.exe			
Application Version	5.6.25.0			
Create Date	7/10/14 11:50 AM			
Log Setup Time Zone	Central Daylight Time			
Notes Size(bytes)	4096			
Overwrite when full	Disabled			
Scheduled Start Time	Manual Start			
Scheduled Stop Time	No Stop Time			
Туре	Fast Linear			

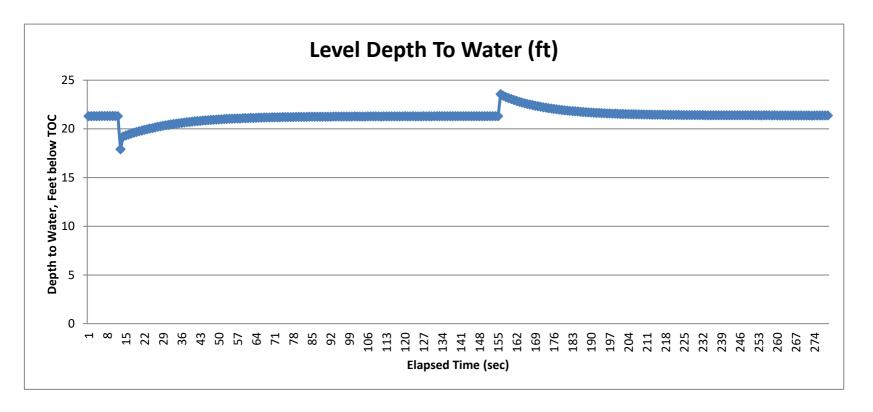
Other Log Settings			
Depth of Probe:	24.4049 (ft)		
Head Pressure:	10.5696 (PSI)		
Temperature:	65.1142 (F)		

Level Reference Settings At Log Creation				
Level Measurement Mode Level Depth To Water				
Specific Gravity	0.999			
Level Reference Mode:	Set new reference			
Level Reference Value:	17.35 (ft)			
Level Reference Head Pressure	10.5736 (PSI)			

Device Properties				
Device	Level TROLL 500			
Site	Plant Yates			
Device Name				
Serial Number	160731			
Firmware Version	2.04			
Hardware Version	3			
Device Address	1			
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)			
Used Memory(%)	87			
Used Battery(%)	23			

Elapsed Time (sec)	Level Depth To Water (ft)								
0	17.348	450	17.098	900	19.398	1350	17.454		
10	17.357	460	17.113	910	19.174	1360	17.446		
20	17.357	470	17.122	920	18.996	1370	17.451		
30	17.364	480	17.144	930	18.842	1380	17.442		
40	17.36	490	17.153	940	18.706	1390	17.441		
50	17.37	500	17.166	950	18.588	1400	17.438		
60	17.362	510	17.174	960	18.48	1410	17.436		
70	17.362	520	17.186			1420	17.429		
80	17.367	530	17.193			1430	17.428		
90	17.365	540	17.195			1440	17.425		
100	17.369	550	17.213		18.164	1450	17.42		
110	17.365	560	17.22			1460	17.419		
120	17.371	570	17.23			1470	17.414		
130	17.369	580	17.234			1480	17.417		
140	17.374	590	17.243		17.943	1490	17.411		
150	17.373	600	17.251	1050	17.904	1500	17.411		
160	17.372	610	17.253			1510	17.408		
170	15.328	620	17.263			1520	17.411		
180	15.505	630	17.263			1530	17.409		
190	15.659	640	17.269			1540	17.409		
200	15.794	650	17.273		17.739	1550	17.408		
210	15.919	660	17.277	1110		1560	17.402		
220 230	16.027 16.132	670	17.281 17.285	1120		1570	17.403 17.404		
240	16.132	680 690	17.285	1130 1140		1580 1590	17.404		
250	16.309	700	17.287	1140	17.64	1600	17.401		
260	16.385	700	17.291	1160		1610	17.401		
270	16.456	720	17.291	1170		1620	17.399		
280	16.52		17.294				17.397		
290	16.576		17.297				17.4		
300	16.623	750	17.3			1650	17.389		
310	16.68		17.304						
320	16.725	770	17.305						
330	16.77	780	17.305						
340	16.807	790	17.309						
350	16.85	800	17.314						
360	16.882	810	17.276						
370	16.917	820	17.317	1270	17.498				
380	16.947	830	17.323	1280	17.493				
390	16.967	840	17.319	1290	17.486				
400	16.993	850	17.317	1300	17.479				
410	17.021	860	17.322	1310	17.474				
420	17.043	870	17.321	1320	17.467				
430	17.062	880	17.321	1330	17.462				
440	17.078	890	17.721	1340	17.455				

**PZ-06 D** 



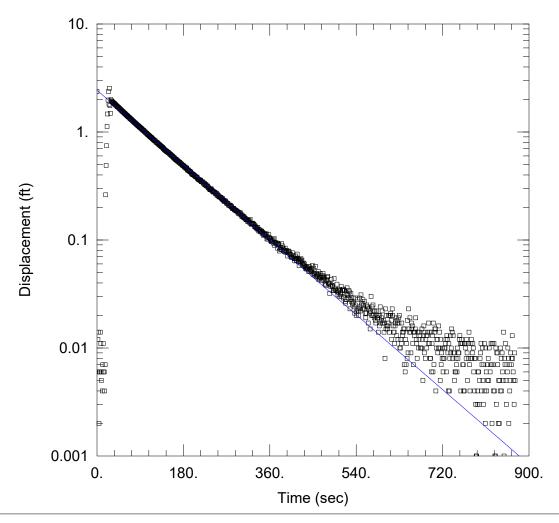
Log Configuration						
Log Name	PZ-06 D					
Created By	X2WSHAUG					
Computer Name	X2WSHAUGH					
Application	WinSitu.exe					
Application Version	5.6.25.0					
Create Date	7/10/14 7:04 AM					
Log Setup Time Zone	Central Daylight Time					
Notes Size(bytes)	4096					
Overwrite when full	Disabled					
Scheduled Start Time	Manual Start					
Scheduled Stop Time	No Stop Time					
Туре	Fast Linear					

Other Log Settings						
Depth of Probe:	88.7382 (ft)					
Head Pressure:	38.432 (PSI)					
Temperature:	63.6079 (F)					

Level Reference Settings At Log Creation						
Level Measurement Mode	Level Depth To Water					
Specific Gravity	0.999					
Level Reference Mode:	Set new reference					
Level Reference Value:	21.33 (ft)					
Level Reference Head Pressure	38.4335 (PSI)					

Device Properties					
Device	Level TROLL 500				
Site	Plant Yates				
Device Name					
Serial Number	160731				
Firmware Version	2.04				
Hardware Version	3				
Device Address	1				
Device Comm Cfg	19200,8,Even,1,(Modbus-RTU)				
Used Memory(%)	78				
Used Battery(%)	23				

Elapsed Time (sec)	Level Depth To Water (ft)								
0	21.313	450	20.898	900	21.257	1350	21.301	1800	21.883
10	21.314	460	20.921	910	21.258	1360	21.299	1810	21.851
20	21.324	470	20.935	920	21.261	1370	21.3	1820	21.826
30	21.305	480	20.956	930	21.262	1380	21.302	1830	21.803
40	21.318	490	20.973	940	21.26	1390	21.3	1840	21.796
50	21.325	500	20.987	950	21.264	1400	21.305	1850	21.755
60	21.319	510	21.008	960	21.269	1410	21.301	1860	21.733
70	21.323	520	21.021	970	21.266	1420	21.302	1870	21.713
80	21.324	530	21.038	980	21.271	1430	21.304	1880	21.696
90	21.322	540	21.05	990	21.271	1440	21.304	1890	21.681
100	21.321	550	21.064	1000	21.293	1450	21.306		21.662
110	21.304	560	21.057	1010	21.275	1460	21.298		21.645
120	17.9	570	21.068	1020	21.276	1470	21.305	1920	21.632
130	19.223	580	21.1	1030	21.276	1480	21.308		21.616
140	19.321	590	21.105	1040	21.276	1490	21.305	1940	21.603
150	19.42	600	21.097	1050	21.278	1500	21.305	1950	21.59
160	19.512	610	21.132	1060	21.281	1510	21.306		21.579
170	19.6	620	21.119		21.279	1520	21.305	1970	21.568
180	19.681	630	21.144		21.279	1530	21.306		21.559
190	19.757	640	21.156		21.28	1540	21.307	1990	21.547
200	19.829	650	21.161	1100	21.274	1550	23.555		21.538
210	19.901	660	21.169		21.28	1560	23.395	2010	21.529
220	19.953	670	21.174	1120	21.288	1570	23.27	2020	21.523
230	20.036	680	21.181	1130	21.287	1580	23.155	2030	21.514
240	20.08	690	21.188	1140	21.29	1590	23.055	2040	21.506
250	20.154	700	21.19		21.286	1600	22.958		21.504
260	20.213	710	21.195	1160	21.288	1610	22.868	2060	21.491
270	20.267	720	21.199		21.292	1620	22.785		21.485
280	20.315		21.207		21.29		22.707		
290	20.37	740	21.212		21.296	1640	22.632	2090	21.48
300	20.41	750	21.214		21.291	1650	22.563		
310	20.461	760	21.218		21.292	1660	22.499		
320	20.501	770	21.219				22.436		
330	20.541		21.223		21.293	1680	22.375		
340	20.579		21.229		21.293	1690	22.323		
350	20.615		21.228		21.294		22.267		
360	20.652	810	21.233		21.296	1710	22.219		
370	20.685		21.239				22.175		
380	20.716		21.24		21.299		22.126		
390	20.744		21.241		21.295	1740	22.089		
400	20.775		21.245		21.3	1750	22.047		
410	20.804	860	21.247		21.298	1760	22.012		
420	20.827	870	21.251				21.974		
430	20.853		21.248		21.298	1780	21.943		
440	20.876	890	21.257	1340	21.301	1790	21.91	2240	21.42



# YATES PZ-17S

Data Set: S:\...\17S-1.aqt

Date: 03/01/17 Time: 08:46:37

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-17S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 27.3 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-17S)

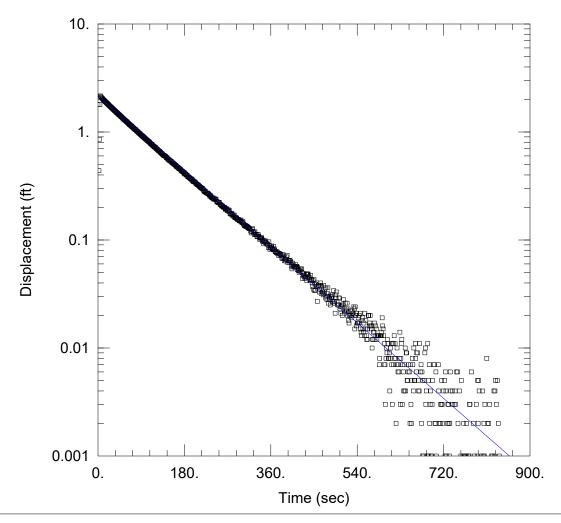
Initial Displacement: 2.37 ft Static Water Column Height: 27.3 ft

Total Well Penetration Depth: 27.15 ft Screen Length: 10. ft Casing Radius: 0.08333 ft Well Radius: 0.08333 ft

**SOLUTION** 

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.9747 ft/day y0 = 2.434 ft



# YATES PZ-17S

Data Set: S:\...\17S-2.aqt

Date: 03/01/17 Time: 08:47:43

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-17S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 27.3 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-17S)

Initial Displacement: 1.8 ft

Static Water Column Height: 27.3 ft

Total Well Penetration Depth: 27.15 ft

Screen Length: 10. ft Well Radius: 0.08333 ft

Casing Radius: 0.08333 ft

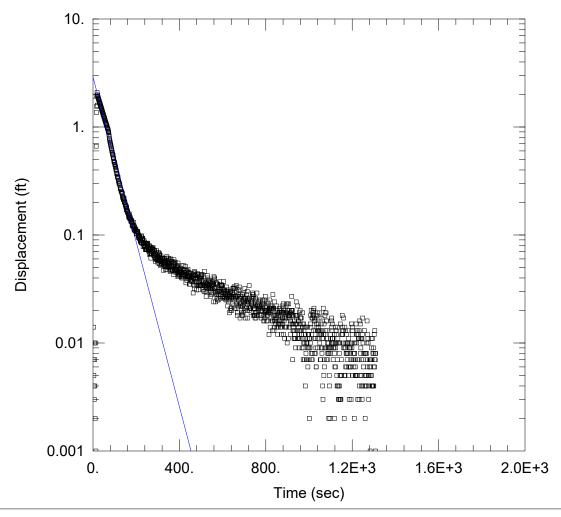
# **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.984 ft/day

y0 = 2.147 ft



# YATES PZ-18I

Data Set: S:\...\18I-1.aqt

Date: 03/01/17 Time: 08:44:47

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-18I
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 65.27 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-18I)

Initial Displacement: 1.93 ft Static Water Column Height: 65.27 ft

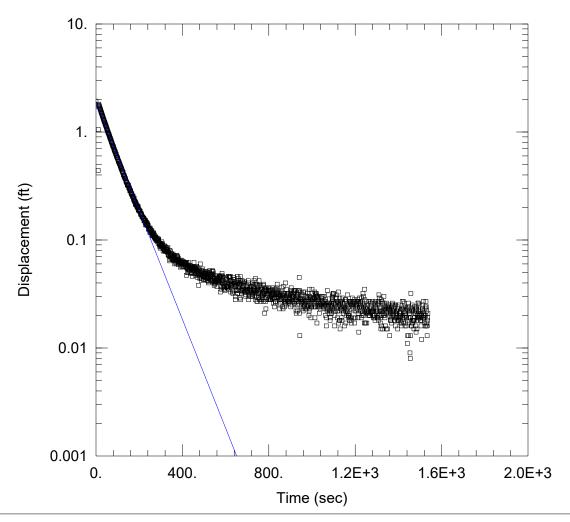
Total Well Penetration Depth: 65.3 ft Screen Length: 10. ft

Casing Radius: 0.08333 ft Well Radius: 0.08333 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.196 ft/day y0 = 2.899 ft



# YATES PZ-18I

Data Set: S:\...\18I-2.aqt

Date: 03/01/17 Time: 08:43:34

# PROJECT INFORMATION

Company: SCS Client: GPC Project: Yates Location: Yates Test Well: PZ-18I Test Date: 11/23/2015

**AQUIFER DATA** 

Saturated Thickness: 65.27 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (Yates PZ-18I)

Static Water Column Height: 65.27 ft Initial Displacement: 1.93 ft

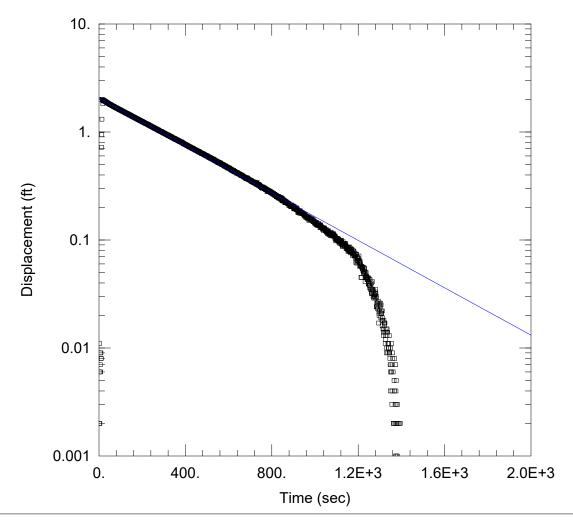
Total Well Penetration Depth: 65.3 ft Screen Length: 10. ft Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

**SOLUTION** 

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.449 ft/dayy0 = 1.896 ft



# YATES PZ-18S

Data Set: S:\...\18S-1.aqt

Date: 03/01/17 Time: 08:51:07

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-18S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 18.6 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-18S)

**SOLUTION** 

Initial Displacement: 2. ft

Static Water Column Height: 18.6 ft

Total Well Penetration Depth: 19.1 ft

Screen Length: 10. ft Well Radius: 0.08333 ft

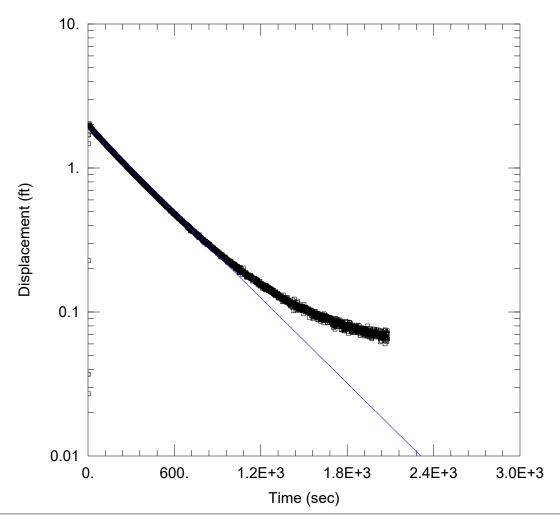
Casing Radius: 0.08333 ft

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.2674 ft/day

y0 = 2.053 ft



# YATES PZ-18S

Data Set: S:\...\18S-2.aqt

Date: 03/01/17 Time: 08:53:39

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-18S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 18.6 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-18S)

Initial Displacement: 1.7 ft

Static Water Column Height: 18.6 ft

Total Well Penetration Depth: 19.1 ft

Screen Length: 10. ft Well Radius: 0.08333 ft

Casing Radius: 0.08333 ft

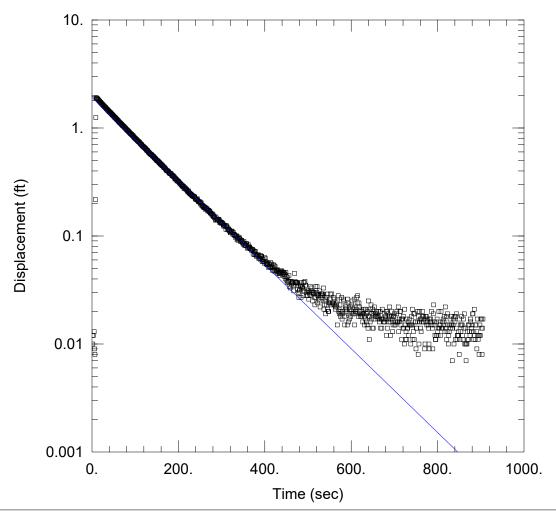
# SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.2407 ft/day

y0 = 1.916 ft



# YATES PZ-19S

Data Set: S:\...\19S-2.aqt

Date: 03/01/17 Time: 08:56:25

# PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-19S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 20.6 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-19S)

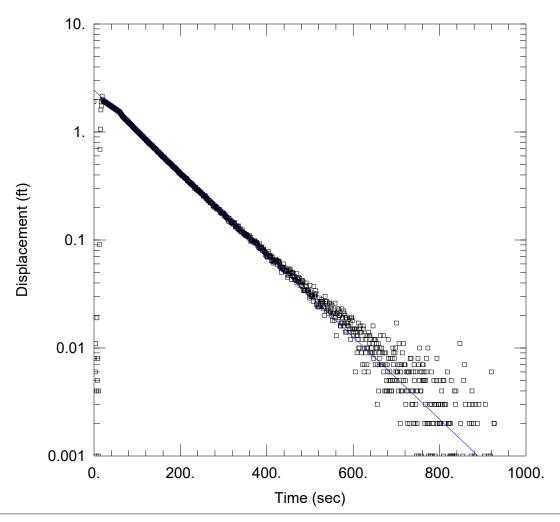
Initial Displacement: 1.87 ft Static Water Column Height: 20.6 ft

Total Well Penetration Depth: 21. ft Screen Length: 10. ft Casing Radius: 0.08333 ft Well Radius: 0.08333 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.9593 ft/day y0 = 1.922 ft



# YATES PZ-20S

Data Set: S:\...\20S-1.aqt

Date: 03/01/17 Time: 08:57:38

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-20S
Test Date: 11/20/2015

#### **AQUIFER DATA**

Saturated Thickness: 20.5 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-20S)

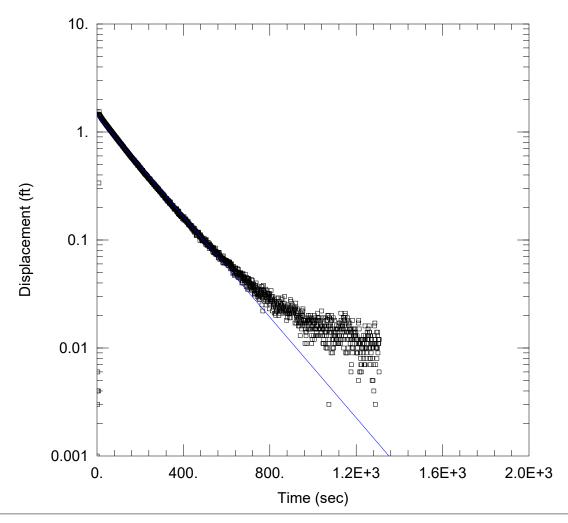
Initial Displacement: 1.91 ft Static Water Column Height: 20.5 ft

Total Well Penetration Depth: 39. ft Screen Length: 10. ft Well Radius: 0.08333 ft Well Radius: 0.08333 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.028 ft/day y0 = 2.444 ft



# YATES PZ-20S

Data Set: S:\...\20S-2.aqt

Date: 03/01/17 Time: 09:13:42

# PROJECT INFORMATION

Company: SCS Client: GPC Project: Yates Location: Yates Test Well: PZ-20S Test Date: 1/13/16

#### **AQUIFER DATA**

Saturated Thickness: 20.5 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-20S)

Static Water Column Height: 20.5 ft Initial Displacement: 1.54 ft

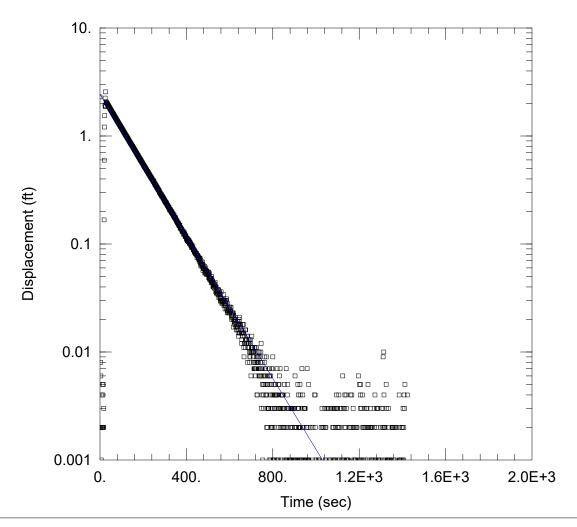
Total Well Penetration Depth: 39. ft Screen Length: 10. ft Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.6286 ft/dayy0 = 1.41 ft



# YATES PZ-22S

Data Set: S:\...\22S-1.aqt

Date: 03/01/17 Time: 09:20:55

# PROJECT INFORMATION

Company: SCS Client: GPC Project: Yates Location: Yates Test Well: PZ-22S Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 30.5 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-22S)

Initial Displacement: 2.3 ft

Static Water Column Height: 30.5 ft

Total Well Penetration Depth: 40.13 ft

Screen Length: 10. ft

Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

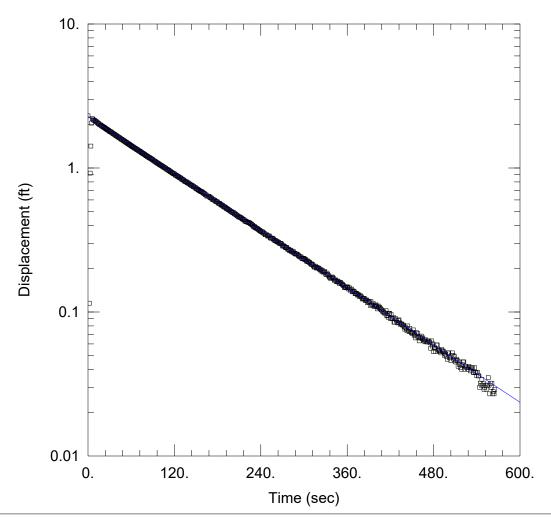
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.8904 ft/day

y0 = 2.434 ft



# YATES PZ-22S

Data Set: S:\...\22S-2.aqt

Date: 03/01/17 Time: 09:22:57

# PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-22S
Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 30.5 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-22S)

Initial Displacement: 2.3 ft

Static Water Column Height: 30.5 ft

Total Well Penetration Depth: 30.13 ft

Screen Length: 10. ft

Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

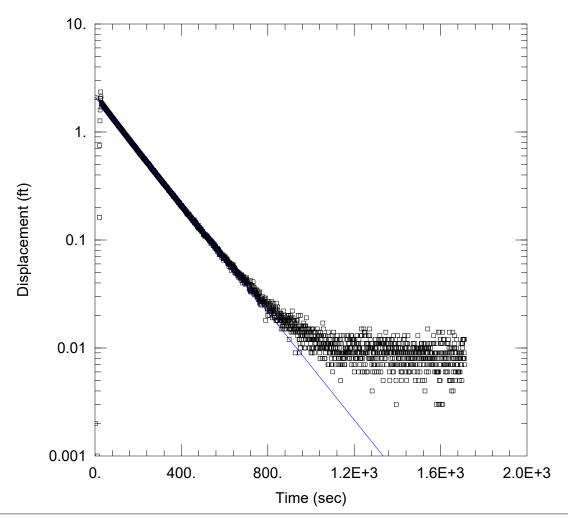
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.828 ft/day

y0 = 2.28 ft



# YATES PZ-23S

Data Set: S:\...\23S-1.aqt

Date: 03/01/17 Time: 09:24:54

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-23S
Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 23.6 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-23S)

Initial Displacement: 2.1 ft

Static Water Column Height: 23.6 ft

Total Well Penetration Depth: 23.3 ft

Screen Length: 10. ft

Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

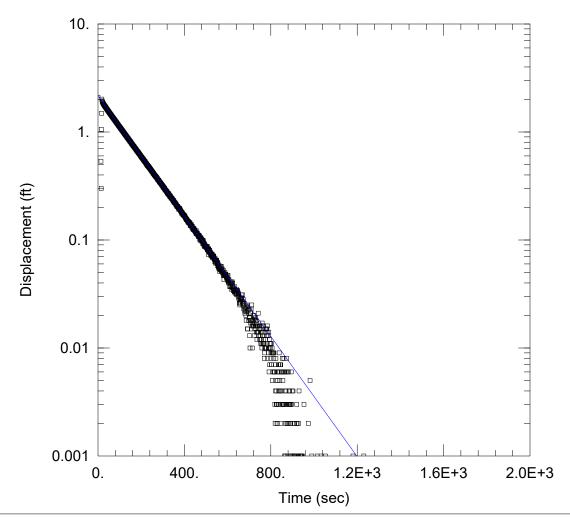
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6054 ft/day

y0 = 2.108 ft



# YATES PZ-23S

Data Set: S:\...\23S-2.aqt

Date: 03/01/17 Time: 09:25:50

#### PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ 23S
Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 23.6 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-23S)

Initial Displacement: 2.1 ft

Static Water Column Height: 23.6 ft

Total Well Penetration Depth: 23.3 ft

Screen Length: 10. ft Well Radius: 0.08333 ft

Casing Radius: 0.08333 ft

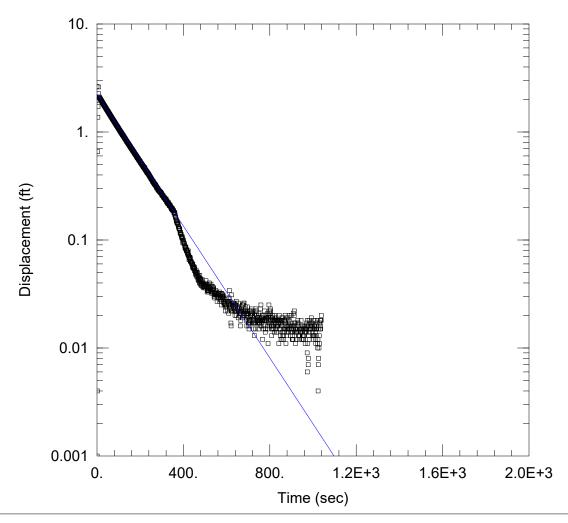
# **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6763 ft/day

y0 = 2.157 ft



# YATES PZ-24S

Data Set: S:\...\24S-1.aqt

Date: 03/01/17 Time: 09:28:07

#### PROJECT INFORMATION

Company: SCS Client: GPC Project: Yates Location: Yates Test Well: PZ-24S Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 29.37 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-24S)

Initial Displacement: 2.64 ft Static Water Column Height: 29.4 ft

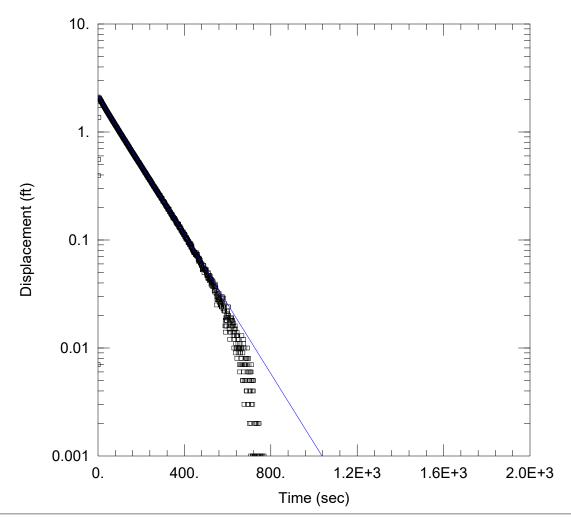
Total Well Penetration Depth: 29.4 ft Screen Length: 10. ft Casing Radius: 0.08333 ft

Well Radius: 0.08333 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.7924 ft/dayy0 = 2.235 ft



# YATES PZ-24S

Data Set: S:\...\24S-2.aqt

Date: 03/01/17 Time: 09:29:40

# PROJECT INFORMATION

Company: SCS
Client: GPC
Project: Yates
Location: Yates
Test Well: PZ-24S
Test Date: 11/23/2015

#### **AQUIFER DATA**

Saturated Thickness: 29.37 ft Anisotropy Ratio (Kz/Kr): 1.

# WELL DATA (Yates PZ-24S)

Initial Displacement: 2.11 ft

Static Water Column Height: 29.4 ft

Total Well Penetration Depth: 29.4 ft

Screen Length: 10. ft Well Radius: 0.08333 ft

Casing Radius: 0.08333 ft

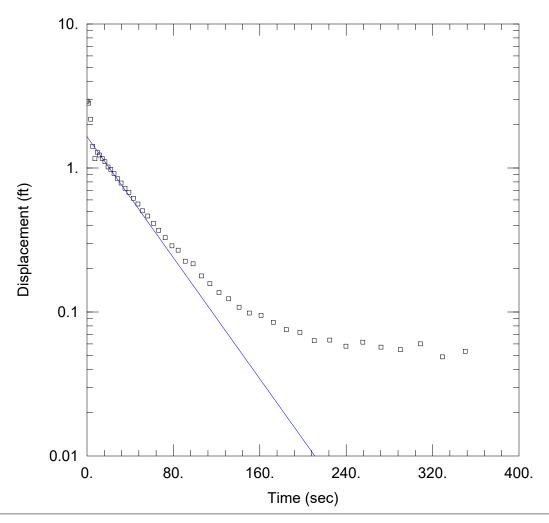
# **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.8348 ft/day

y0 = 2.161 ft



Data Set: P:\...\PZ-35 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:12:51</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-35 IN
Test Date: 3/7/2017

# **AQUIFER DATA**

Saturated Thickness: 36.58 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-35)

Initial Displacement: 2.91 ft

Total Well Penetration Depth: 36.58 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 36.58 ft

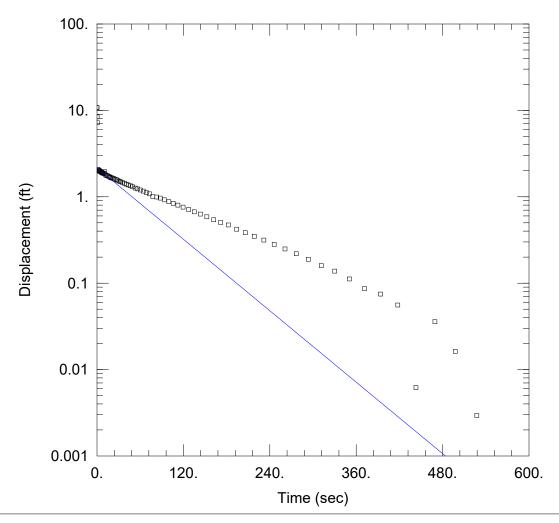
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.003119 cm/sec y0 = 1.65 ft



Data Set: P:\...\PZ-35 OUT.aqt

Date: 03/15/17 Time: 14:13:10

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-35 OUT
Test Date: 3/7/2017

# **AQUIFER DATA**

Saturated Thickness: 36.58 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-35)

Initial Displacement: 10.76 ft

Total Well Penetration Depth: 36.58 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 36.58 ft

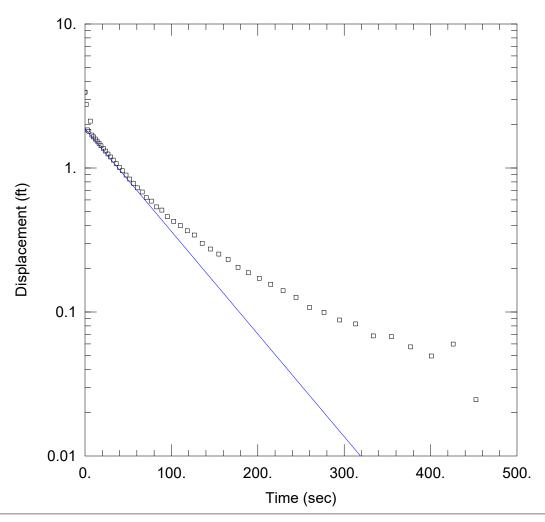
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.002045 cm/sec y0 = 2.163 ft



Data Set: P:\...\PZ-37 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:13:25</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-37 IN
Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 12.66 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-37)

Initial Displacement: 3.36 ft

Static Water Column Height: 35.43 ft

Total Well Penetration Depth: 36.43 ft Casing Radius: 0.0833 ft

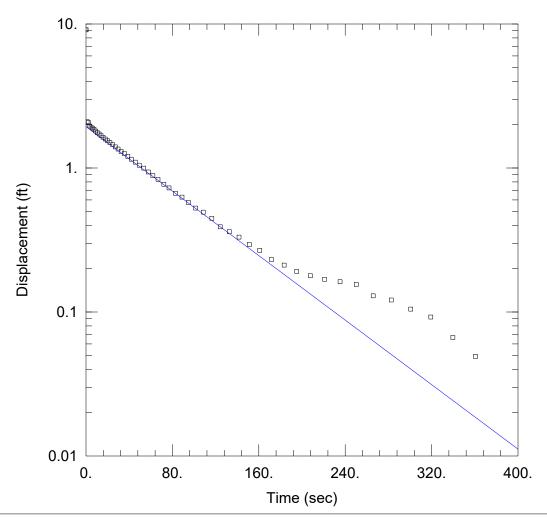
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.002113 cm/sec y0 = 1.871 ft



Data Set: P:\...\PZ-37 OUT.aqt

Date: 03/15/17 Time: 14:13:36

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: PZ-37 OUT Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 12.66 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-37)

Initial Displacement: 9.11 ft

Total Well Penetration Depth: 35.43 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 35.43 ft

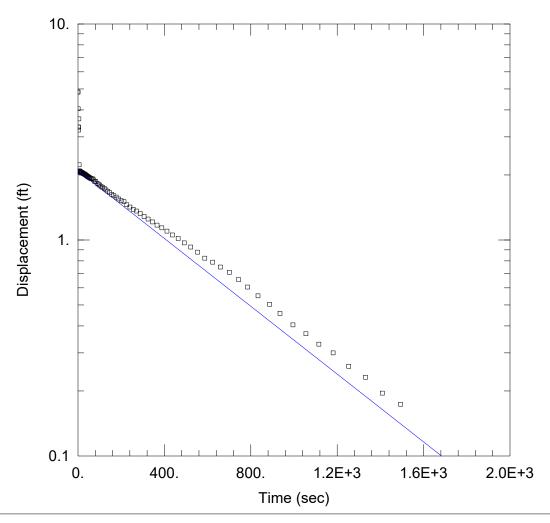
Screen Length: 10. ft Well Radius: 0.25 ft Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001653 cm/secy0 = 1.938 ft



Data Set: P:\...\PZ-38 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:13:49</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-38 IN
Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 19.02 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-38)

Initial Displacement: 4.84 ft

Total Well Penetration Depth: 19.02 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 19.02 ft

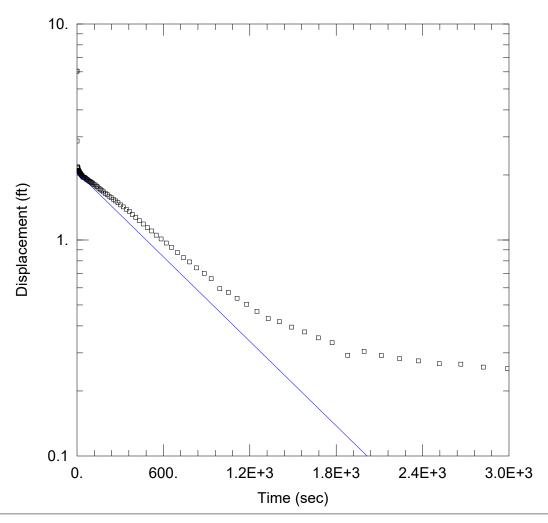
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0002079 cm/sec y0 = 2.093 ft



Data Set: P:\...\PZ-38 OUT.aqt

Date: 03/15/17 Time: 14:14:09

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: PZ-38 OUT Test Date: 3/8/2017

# AQUIFER DATA

Saturated Thickness: 19.02 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-38)

Initial Displacement: 6.05 ft

Total Well Penetration Depth: 19.02 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 19.02 ft

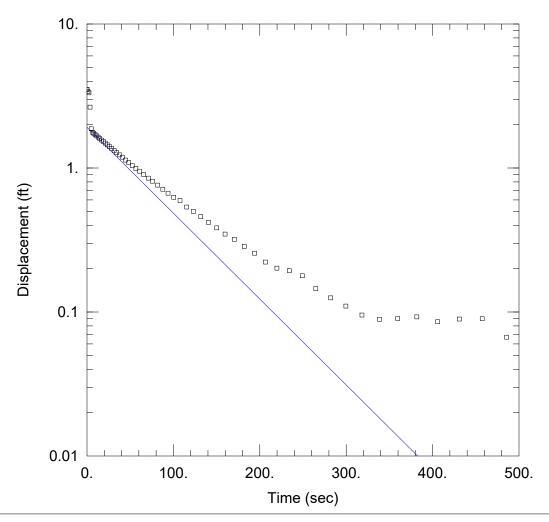
Screen Length: 10. ft Well Radius: 0.25 ft Gravel Pack Porosity: 0.3

### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001727 cm/secy0 = 2.056 ft



Data Set: P:\...\PZ-39 IN.aqt

Date: 03/15/17 Time: 14:14:25

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-39 IN
Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 42.21 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-39)

Initial Displacement: 3.52 ft

Total Well Penetration Depth: 42.21 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 42.21 ft

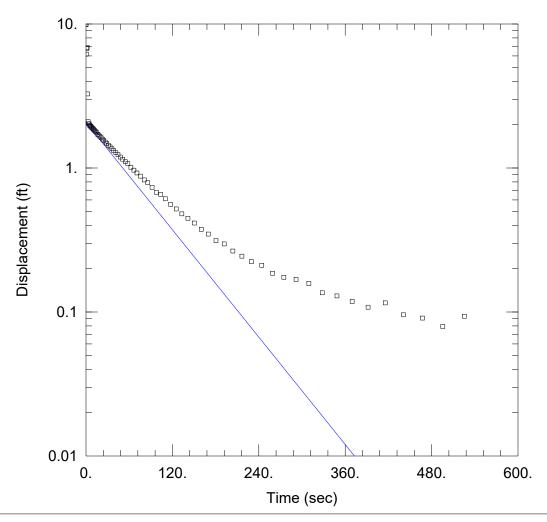
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

# **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.00181 cm/sec y0 = 1.917 ft



Data Set: P:\...\PZ-39 OUT.aqt

Date: 03/15/17 Time: 14:14:44

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-39 OUT
Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 42.21 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-39)

Initial Displacement: 9.91 ft

Total Well Penetration Depth: 42.21 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 42.21 ft

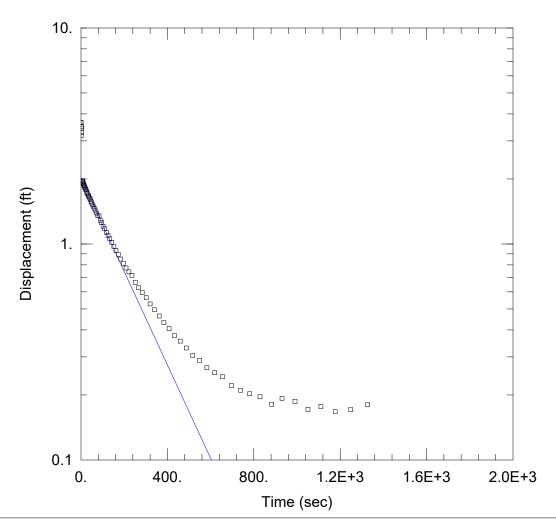
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001885 cm/sec y0 = 2.074 ft



Data Set: P:\...\PZ-40 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:15:02</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-40 IN
Test Date: 3/8/2017

# **AQUIFER DATA**

Saturated Thickness: 20.13 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-40)

Initial Displacement: 3.66 ft

Total Well Penetration Depth: 20.13 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 20.13 ft

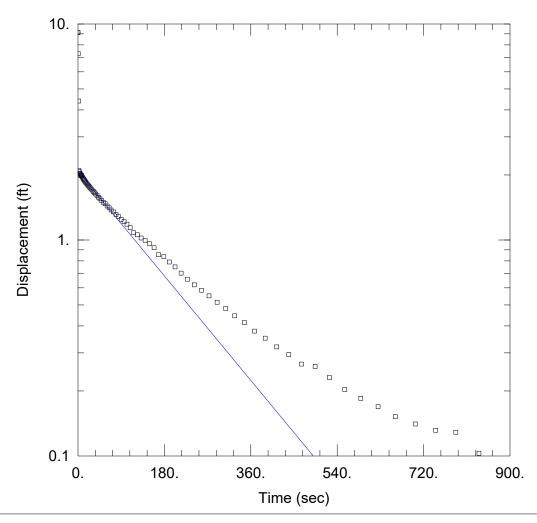
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0005789 cm/sec y0 = 2.019 ft



Data Set: P:\...\PZ-40 OUT.aqt

Date: <u>03/15/17</u> Time: <u>14:15:18</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: PZ-40 OUT
Test Date: 3/8/2017

#### **AQUIFER DATA**

Saturated Thickness: 20.13 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-40)

Initial Displacement: 9.12 ft

Total Well Penetration Depth: 20.13 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 20.13 ft

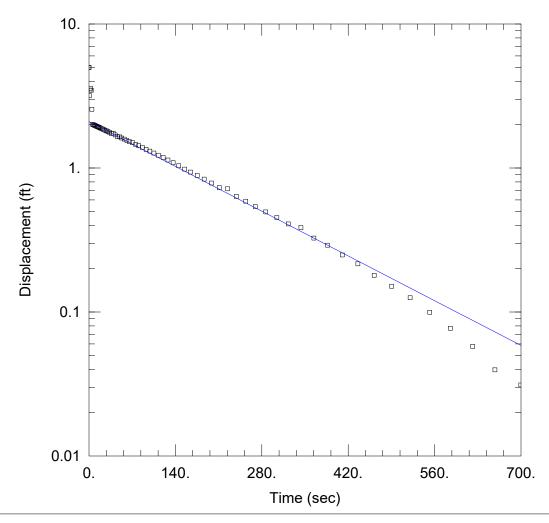
Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0007197 cm/sec y0 = 2.077 ft



Data Set: P:\...\PZ-48 IN.aqt

Date: 03/15/17 Time: 14:16:14

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: PZ-48 IN Test Date: 3/7/2017

#### **AQUIFER DATA**

Saturated Thickness: 34.93 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-48)

Initial Displacement: 4.99 ft

Total Well Penetration Depth: 34.93 ft

Static Water Column Height: 34.93 ft

Casing Radius: 0.0833 ft

Screen Length: 10. ft Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

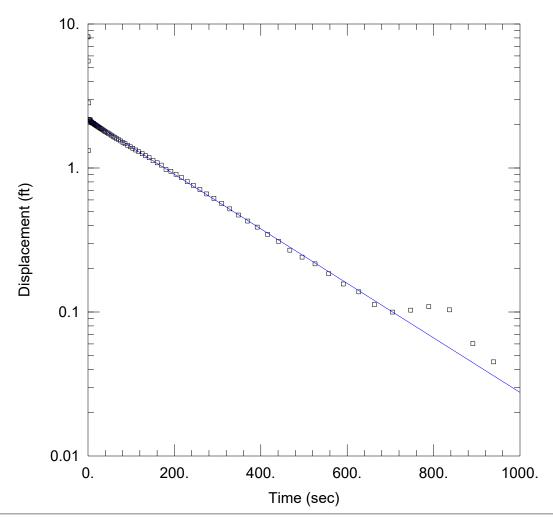
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0006539 cm/sec

y0 = 2.098 ft



Data Set: P:\...\PZ-48 OUT.aqt

Date: 03/15/17 Time: 14:16:27

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: PZ-48 OUT Test Date: 3/7/2017

#### **AQUIFER DATA**

Saturated Thickness: 34.93 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (PZ-48)

Initial Displacement: 8.14 ft

Total Well Penetration Depth: 34.93 ft

Casing Radius: 0.0833 ft

Static Water Column Height: 34.93 ft

Screen Length: 10. ft Well Radius: 0.25 ft Gravel Pack Porosity: 0.3

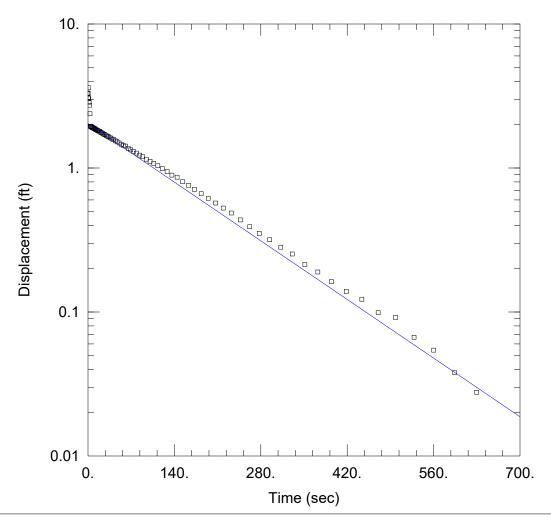
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0005577 cm/sec

y0 = 2.162 ft



Data Set: P:\...\YGWA-47 IN.aqt

Date: 03/15/17 Time: 14:16:43

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: YGWA-47 IN Test Date: 3/3/2017

#### AQUIFER DATA

Saturated Thickness: 27.53 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWA-47)

Initial Displacement: 3.31 ft

Static Water Column Height: 27.53 ft

Total Well Penetration Depth: 27.53 ft Casing Radius: 0.0833 ft

Screen Length: 10. ft Well Radius: 0.25 ft

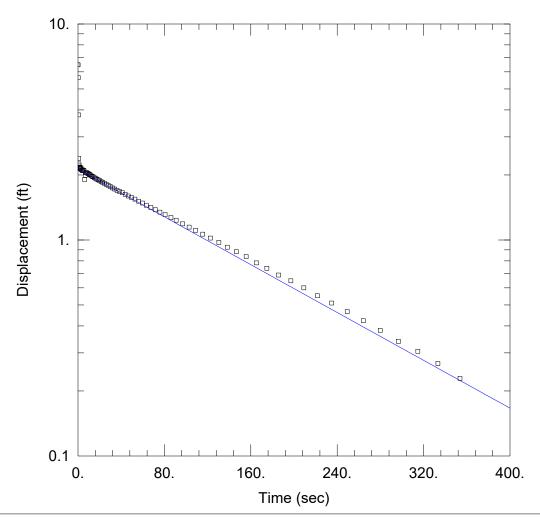
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0008235 cm/secy0 = 2.036 ft



Data Set: P:\...\YGWA-47 OUT.aqt

Date: 03/15/17 Time: 14:16:59

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: YGWA-47 OUT Test Date: 3/3/2017

#### AQUIFER DATA

Saturated Thickness: 27.53 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWA-47)

Initial Displacement: 6.47 ft

Static Water Column Height: 27.53 ft

Total Well Penetration Depth: 27.53 ft

Screen Length: 10. ft Well Radius: 0.25 ft

Casing Radius: 0.0833 ft

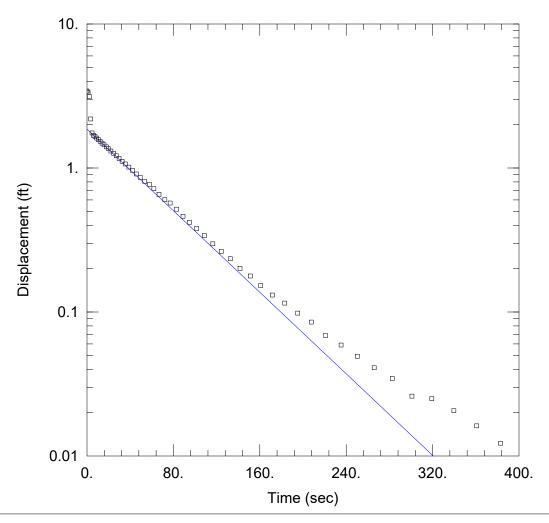
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0007836 cm/secy0 = 2.131 ft



Data Set: P:\...\YGWC-32I IN.aqt

Date: <u>03/15/17</u> Time: <u>14:19:20</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-32I IN
Test Date: 3/9/2017

#### **AQUIFER DATA**

Saturated Thickness: 19.03 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-32I)

Initial Displacement: 3.42 ft Static Water Column Height: 19.03 ft

Total Well Penetration Depth: 19.03 ft

Casing Radius: 0.0833 ft

Screen Length: 10. ft

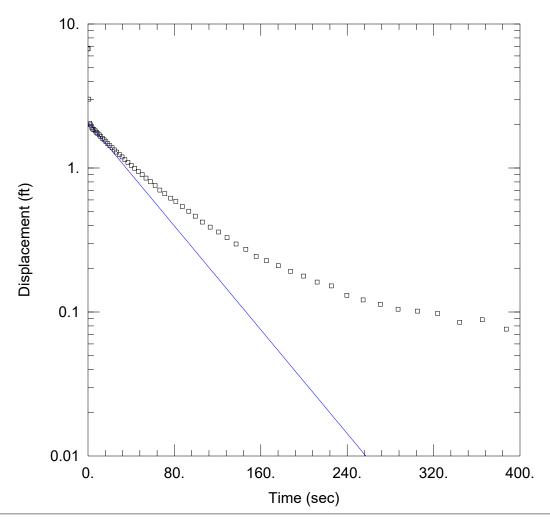
Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.001876 cm/sec y0 = 1.86 ft



Data Set: P:\...\YGWC-32I OUT.aqt

Date: <u>03/15/17</u> Time: <u>14:19:37</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-32I OUT

Test Date: 3/9/2017

#### **AQUIFER DATA**

Saturated Thickness: 19.03 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-32I)

Initial Displacement: 6.72 ft

Total Well Penetration Depth: 19.03 ft

Static Water Column Height: 19.03 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

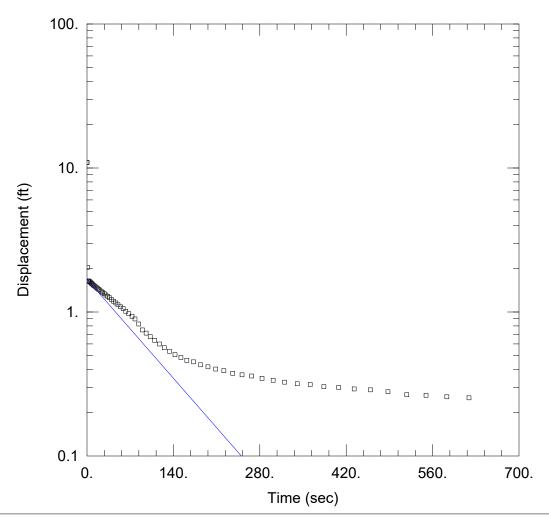
#### **SOLUTION**

Aquifer Model: Unconfined

Casing Radius: 0.0833 ft

Solution Method: Bouwer-Rice

K = 0.002387 cm/sec y0 = 2.079 ft



Data Set: P:\...\YGWC-32S IN.aqt

Date: 03/15/17 Time: 14:19:56

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-32S IN
Test Date: 3/9/2017

#### **AQUIFER DATA**

Saturated Thickness: 7.03 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-32S)

Initial Displacement: 10.91 ft

Static Water Column Height: 7.03 ft

Total Well Penetration Depth: 7.03 ft

Screen Length: 7.03 ft Well Radius: 0.25 ft

Casing Radius: 0.0833 ft

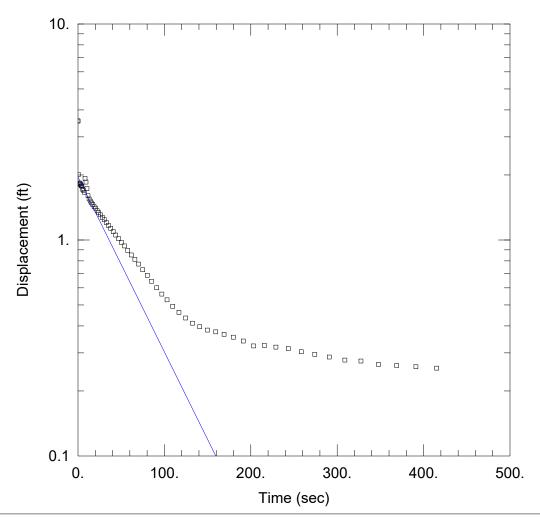
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.001447 cm/sec y0 = 1.683 ft



Data Set: P:\...\YGWC-32S OUT.aqt

Date: 03/15/17 Time: 14:20:09

#### PROJECT INFORMATION

Company: <u>ACC</u>
Project: <u>I054-104</u>
Location: Plant Yates

Test Well: YGWC-32S OUT

Test Date: 3/9/2017

#### **AQUIFER DATA**

Saturated Thickness: 7.03 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-32S)

Initial Displacement: 3.56 ft

Total Well Penetration Depth: 7.03 ft Screen Length: 7.03 ft Wall Parlings 0.0003 ft

Casing Radius: 0.0833 ft Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

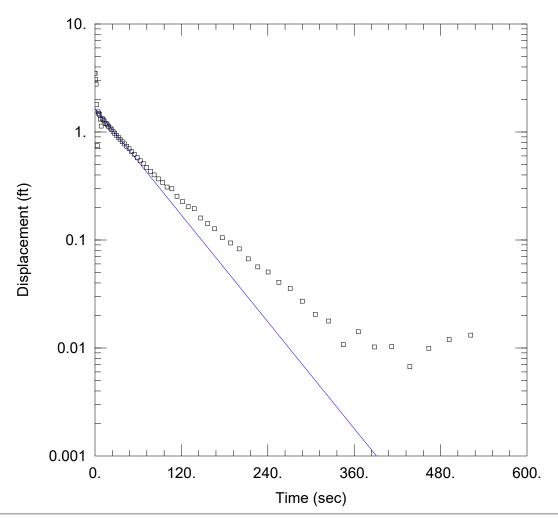
Gravel Pack Porosity: <u>0.3</u>

Static Water Column Height: 7.03 ft

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.00239 cm/sec y0 = 1.956 ft



Data Set: P:\...\YGWC-33S IN.aqt

Date: <u>03/15/17</u> Time: <u>14:20:26</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-33S IN
Test Date: 3/7/2017

#### **AQUIFER DATA**

Saturated Thickness: 30.12 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-33S)

Initial Displacement: 3.5 ft Static Water Column Height: 30.12 ft

Total Well Penetration Depth: 30.12 ft

Casing Radius: 0.0833 ft

Screen Length: 10. ft

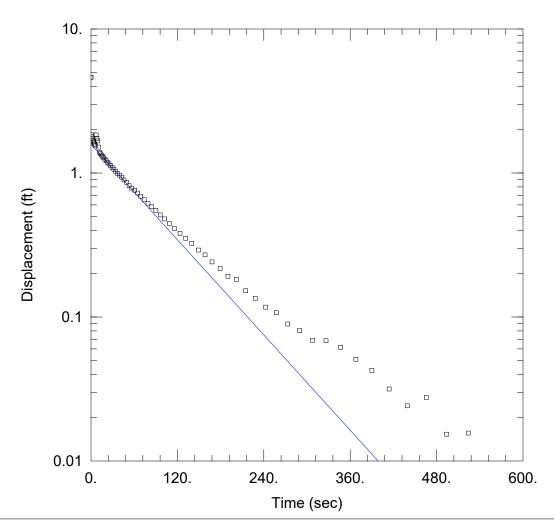
Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.002368 cm/sec y0 = 1.657 ft



Data Set: P:\...\YGWC-33S OUT.aqt

Date: 03/15/17 Time: 14:20:44

#### PROJECT INFORMATION

Company: <u>ACC</u>
Project: <u>1054-104</u>
Location: Plant Yates

Test Well: YGWC-33S OUT

Test Date: 3/7/2017

#### **AQUIFER DATA**

Saturated Thickness: 30.12 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-33S)

Initial Displacement: 4.62 ft Static Water Column Height: 30.12 ft

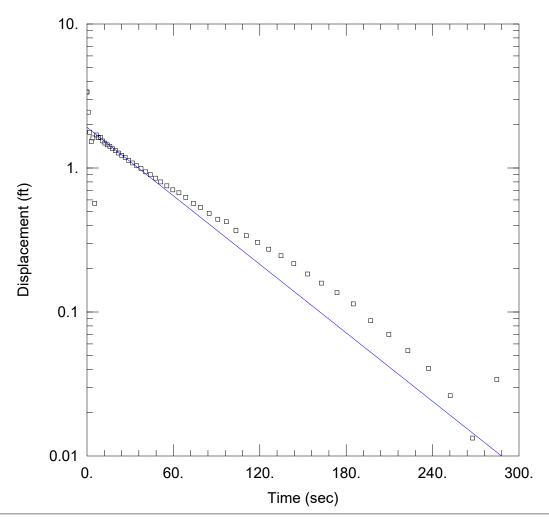
Total Well Penetration Depth: 30.12 ft
Casing Radius: 0.0833 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.001584 cm/sec y0 = 1.577 ft



Data Set: P:\...\YGWC-34I IN.aqt

Date: <u>03/15/17</u> Time: <u>14:21:01</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-341 IN
Test Date: 3/8/2017

#### **AQUIFER DATA**

Saturated Thickness: 14.25 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-34I)

Initial Displacement: 3.37 ft Static Water Column Height: 14.25 ft

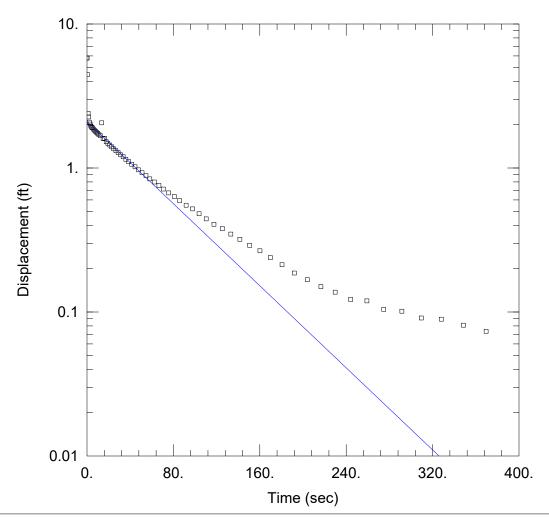
Total Well Penetration Depth: 14.25 ft Screen Length: 10. ft Screen Length: 0.0833 ft Well Radius: 0.25 ft Screen Length: 0.25 ft Screen

Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.001985 cm/sec y0 = 1.915 ft



Data Set: P:\...\YGWC-34I OUT.aqt

Date: <u>03/15/17</u> Time: <u>14:21:19</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-34I OUT
Test Date: 3/8/2017

#### **AQUIFER DATA**

Saturated Thickness: 14.25 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-34I)

Initial Displacement: 5.8 ft Static Water Column Height: 14.25 ft

Total Well Penetration Depth: 14.25 ft

Casing Radius: 0.0833 ft

Screen Length: 10. ft

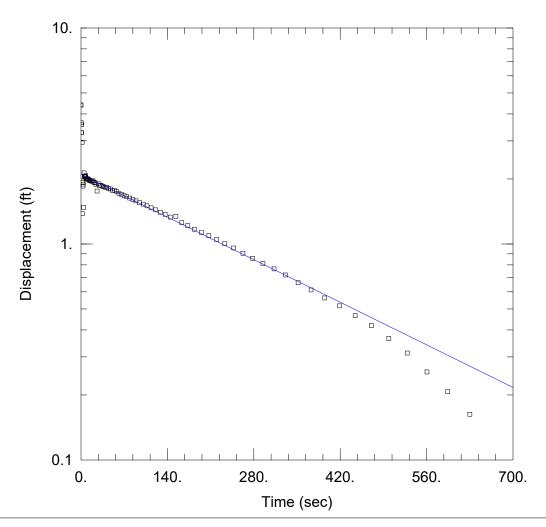
Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.001784 cm/sec y0 = 2.098 ft



Data Set: P:\...\YGWC-36 IN.aqt

Date: 03/15/17 Time: 14:21:36

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-36 IN
Test Date: 3/6/2017

#### **AQUIFER DATA**

Saturated Thickness: 45.56 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-36)

Initial Displacement: 4.4 ft

Ift Static Water Column Height: 45.56 ft

Total Well Penetration Depth: 45.56 ft Casing Radius: 0.0833 ft

Screen Length: 10. ft
Well Radius: 0.25 ft

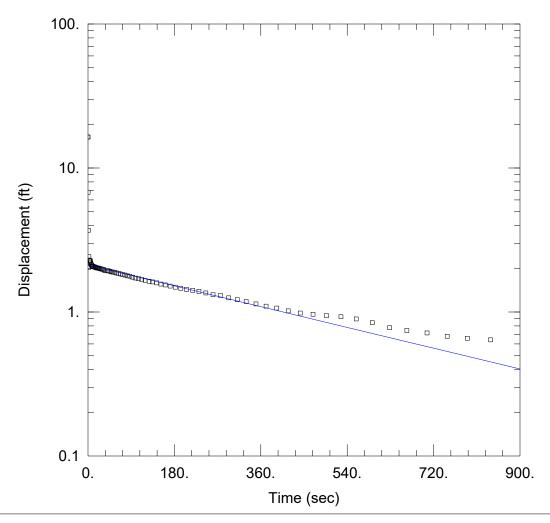
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0004323 cm/sec y0 = 2.097 ft



Data Set: P:\...\YGWC-36 OUT.aqt

Date: 03/15/17 Time: 14:21:55

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-36 OUT
Test Date: 3/6/2017

**AQUIFER DATA** 

Saturated Thickness: 45.56 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (YGWC-36)

**SOLUTION** 

Initial Displacement: 16.41 ft

Static Water Column Height: 45.56 ft

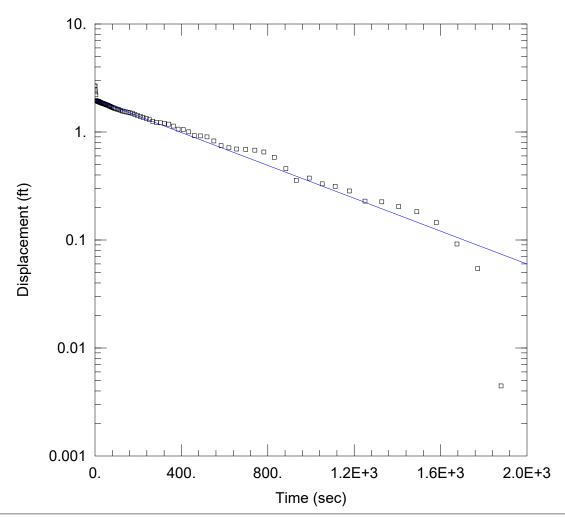
Total Well Penetration Depth: 45.56 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.0833 ft

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.000246 cm/sec y0 = 2.116 ft



Data Set: P:\...\YGWC-42 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:22:11</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-42 IN
Test Date: 3/6/2017

#### **AQUIFER DATA**

Saturated Thickness: 31.41 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-42)

Initial Displacement: 2.67 ft

Static Water Column Height: 21.41 ft

Total Well Penetration Depth: 31.41 ft Casing Radius: 0.0833 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Cravel Back Parasity: 0

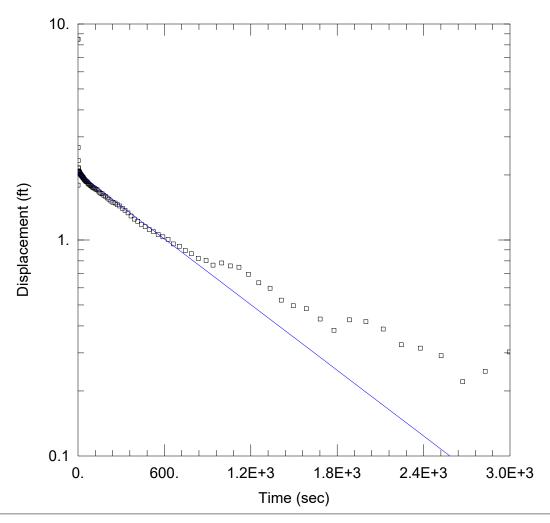
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0002203 cm/sec y0 = 1.992 ft



Data Set: P:\...\YGWC-42 OUT.aqt

Date: <u>03/15/17</u> Time: <u>14:22:47</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-42 OUT
Test Date: 3/6/2017

#### **AQUIFER DATA**

Saturated Thickness: 31.41 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-42)

Initial Displacement: 8.5 ft

31 41 ft Screen Len

Static Water Column Height: 31.41 ft

Total Well Penetration Depth: 31.41 ft

Screen Length: 10. ft Well Radius: 0.25 ft

Casing Radius: 0.0833 ft

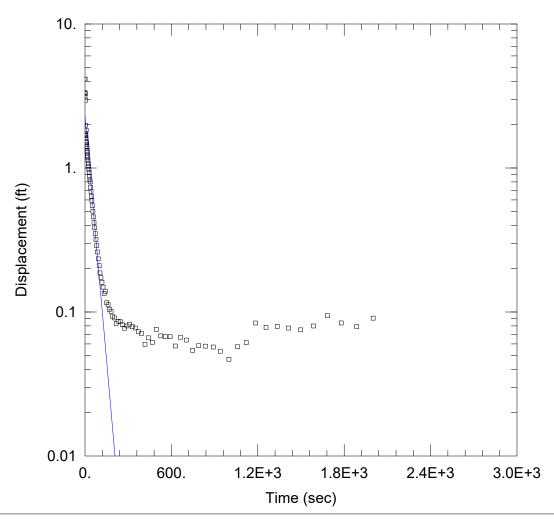
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001467 cm/sec y0 = 2.036 ft



Data Set: P:\...\YGWC-43 IN.aqt

Date: 03/15/17 Time: 14:23:00

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-43 IN
Test Date: 3/2/2017

#### **AQUIFER DATA**

Saturated Thickness: 55.59 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-43)

Initial Displacement: 4.14 ft Static Water Column Height: 65.59 ft

Total Well Penetration Depth: 65.59 ft

Casing Radius: 0.0833 ft

Screen Length: 10. ft

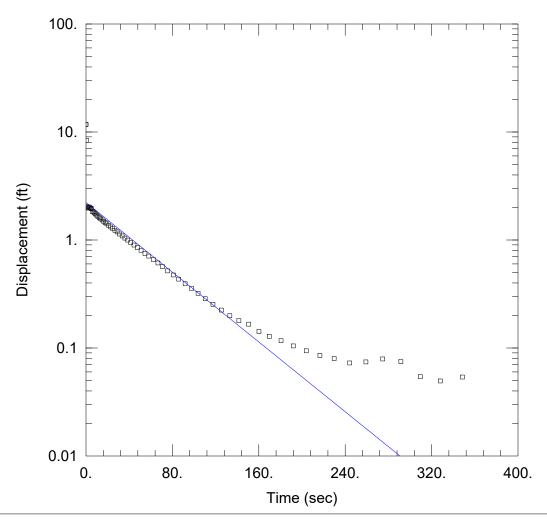
Well Radius: 0.25 ft

Gravel Pack Porosity: 0.3

**SOLUTION** 

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.003663 cm/sec y0 = 2.293 ft



Data Set: P:\...\YGWC-43 OUT.aqt

Date: 03/15/17 Time: 14:23:17

#### PROJECT INFORMATION

Company: ACC Project: 1054-104 Location: Plant Yates Test Well: YGWC-43 OUT Test Date: 3/2/2017

#### **AQUIFER DATA**

Saturated Thickness: 65.59 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-43)

Initial Displacement: 11.74 ft

Static Water Column Height: 65.59 ft

Total Well Penetration Depth: 65.59 ft Casing Radius: 0.0833 ft

Screen Length: 10. ft Well Radius: 0.25 ft

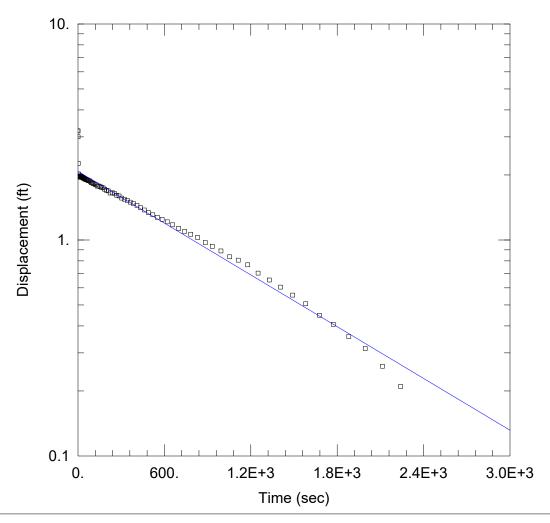
Gravel Pack Porosity: 0.3

**SOLUTION** 

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.002614 cm/secy0 = 2.228 ft



Data Set: P:\...\YGWC-44 IN.aqt

Date: 03/15/17 Time: 14:23:30

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-44 IN
Test Date: 3/2/2017

#### **AQUIFER DATA**

Saturated Thickness: 39.39 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-44)

Initial Displacement: 3.2 ft

Static Water Column Height: 39.39 ft

Total Well Penetration Depth: 39.39 ft

Screen Length: 10. ft
Well Radius: 0.25 ft

Casing Radius: 0.0833 ft

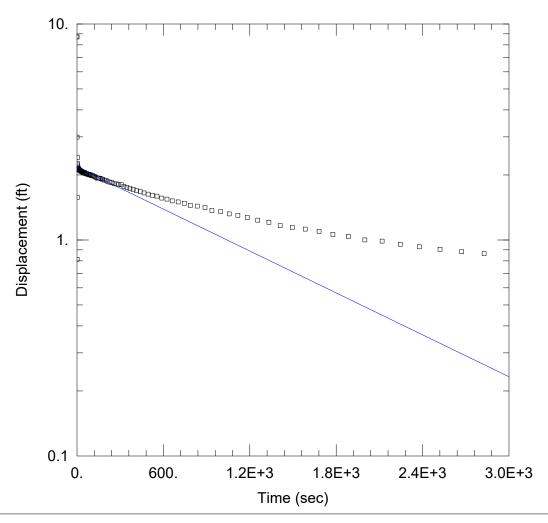
Gravel Pack Porosity: 0.3

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0001199 cm/sec y0 = 2.078 ft



Data Set: P:\...\YGWC-44 OUT.aqt

Date: 03/15/17 Time: 14:23:48

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-44 OUT
Test Date: 3/2/2017

#### **AQUIFER DATA**

Saturated Thickness: 39.39 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-44)

Initial Displacement: 8.71 ft

Static Water Column Height: 39.39 ft

Total Well Penetration Depth: 39.39 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

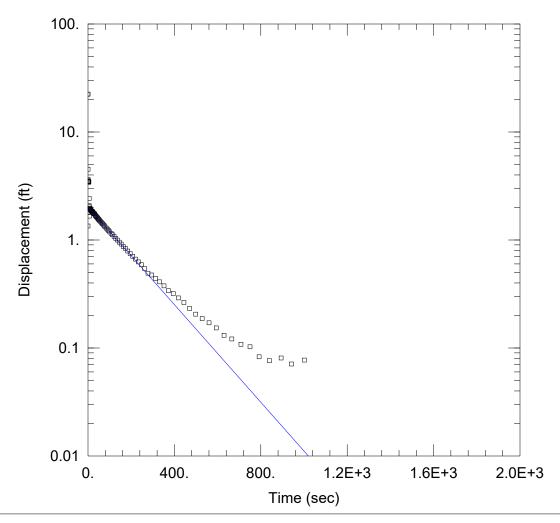
Casing Radius: 0.0833 ft

#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 9.707E-5 cm/sec y0 = 2.172 ft



Data Set: P:\...\YGWC-49 IN.aqt

Date: <u>03/15/17</u> Time: <u>14:25:07</u>

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-49 IN
Test Date: 3/6/2017

#### **AQUIFER DATA**

Saturated Thickness: 44.89 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-49)

Initial Displacement: 22.38 ft

Static Water Column Height: 44.89 ft

Total Well Penetration Depth: 44.89 ft

Screen Length: 10. ft Well Radius: 0.25 ft

Casing Radius: 0.0833 ft

Gravel Pack Porosity: 0.3

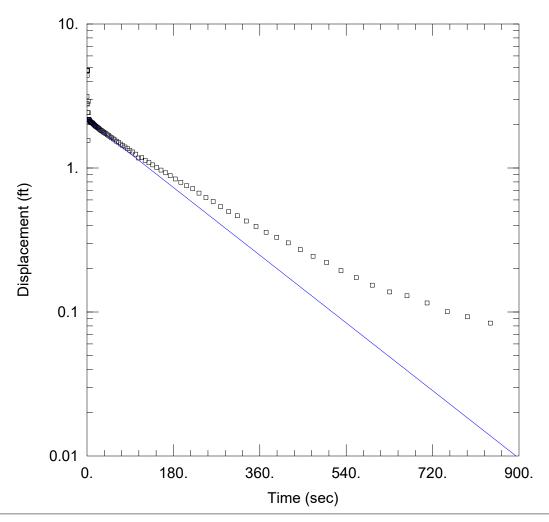
#### **SOLUTION**

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0006917 cm/sec

y0 = 2.015 ft



Data Set: P:\...\YGWC-49 OUT.aqt

Date: 03/15/17 Time: 14:25:20

#### PROJECT INFORMATION

Company: ACC
Project: 1054-104
Location: Plant Yates
Test Well: YGWC-49 OUT
Test Date: 3/6/2017

#### **AQUIFER DATA**

Saturated Thickness: 44.89 ft Anisotropy Ratio (Kz/Kr): 1.

#### WELL DATA (YGWC-49)

**SOLUTION** 

Initial Displacement: 4.74 ft

Static Water Column Height: 44.89 ft

Total Well Penetration Depth: 44.89 ft

Screen Length: 10. ft
Well Radius: 0.25 ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.0833 ft

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0008 cm/sec y0 = 2.162 ft



October 27, 2015

Bart Smelser **Southern Company Services, Inc.** 299 Logan Martin Village Road Vincent, AL 35178 205-438-5893 direct

**Subject:** Laboratory Testing Results

Plant Yates Piezometers Geotechnical Investigation

Cardno Project Number Z003000203

Cardno ATC

200 Wellington Manor Court Suite 100 Birmingham, AL 35007

Phone +1 205 733 8775 Fax +1 205 733 8954 www.cardno.com

www.cardnoatc.com

#### Mr. Smelser:

Cardno ATC has completed the soils testing for the Shelby Tube samples collected from the Plant Yates Piezometers location. These samples were collected by Southern Company Services, Inc. and delivered to the Cardno ATC laboratory in Alabaster, AL by members of Cardno staff. This work was conducted in accordance with the master agreement between Cardno ATC and Southern Company Affiliates, dated February 28, 2014, and detailed in the Work Authorization dated September 23, 2015.

The purpose of this letter is to report the results of the laboratory testing which are detailed in the following pages.

Cardno ATC sincerely appreciates the opportunity to work with you on this project. If you have any questions or if we may be of further service to you, please contact us.

Respectfully Submitted,

Cardno ATC

Brian A. White, CET Laboratory Supervisor

Cardno ATC

Direct Line +1 205 624 1870

Email: gauen.alexander@cardno.com

Enclosures: laboratory report

Fred R. DeLeon, Jr., P.E., P.G.

Principal Engineer Cardno ATC

Direct Line +1 205 624 1876

Email: fred.deleon@cardno.com



## **Table of Contents**

Summary of Laboratory Results	1
PZ-17s Laboratory Results	2
PZ-19s Laboratory Results	5
PZ-20s Laboratory Results	8
PZ-22s Laboratory Results	11
PZ-24s Laboratory Results	15
PZ-25s Laboratory Results	19
PZ-26s Laboratory Results	23
PZ-27s Laboratory Results	27
PZ-28s Laboratory Results	31
PZ-30s Laboratory Results	34
PZ-31s Laboratory Results	37



200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775 Fax: 205-733-8954

### **SUMMARY OF LABORATORY RESULTS**

PAGE 1 OF 1

CLIENT Southern Company Services

PROJECT NAME Plant Yates Piezometers

PROJECT NUMBER _Z003000203 PROJECT LOCATION Newnan, G	GΑ
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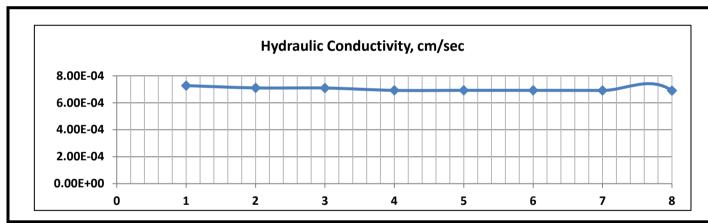
	Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class- ification	Water Content (%)	Dry Density (pcf)	Specific Gravity	Void Ratio
	PZ-17s	17.0	NP	NP	NP	4.75	21.2	SM-SC			2.665	
	PZ-19s	17.0	NP	NP	NP	9.5	42.0	SM-SC			2.681	
	PZ-20s	17.0	NP	NP	NP	4.75	28.9	SM-SC			2.665	
	PZ-22s	7.0	NP	NP	NP	9.5	20.3	SM-SC			2.731	
	PZ-22s	17.0	NP	NP	NP	9.5	28.0	SM-SC			2.717	
2	PZ-24s	17.0	NP	NP	NP	19	15.3	SM-SC			2.693	
38.G	PZ-24s	37.0	NP	NP	NP	4.75	22.0	SM-SC			2.701	
1ETE	PZ-25s	33.0	NP	NP	NP	9.5	23.4	SM-SC			2.678	
NOZ:	PZ-25s	44.0	NP	NP	NP	19	22.3	SM-SC			2.682	
SPII	PZ-26s	17.0	37	27	10	4.75	57.9	ML			2.741	
YATE	PZ-26s	27.0	NP	NP	NP	4.75	33.7	SM-SC			2.720	
ANT	PZ-27s	17.0	39	30	9	4.75	73.5	ML			2.661	
<u> </u>	PZ-27s	27.0	NP	NP	NP	2	45.0	SM-SC			2.673	
S/GII	PZ-28s	17.0	NP	NP	NP	19	18.9	SM-SC			2.578	
ZOMETERS/GINT/PLANT YATES PIEZOMETERS.GPJ	PZ-30s	27.0	NP	NP	NP	4.75	16.6	SM-SC			2.710	
ZOM	PZ-31s	7.0	NP	NP	NP	4.75	16.7	SM-SC			2.653	

## Measurement of Hydraulic Conductivity of Saturated Porous Materials Using <u>a Flexible Wall Permeameter</u>

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-17s (17'-19')
Sample Location :	PZ-17S (17'-19') UD-01	Date Sampled:	09/10/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions	
Wet Density, pcf	119.8	Pressure	s, psi	Wet Density, pcf	119.6
Dry Density, pcf	98.0	Chamber	92	Dry Density, pcf	98.1
Moisture Content, %	22.2	Head	79	Moisture Content, %	22.0
Void ratio, e	0.697	Tail	77	Void ratio, e	0.695
Porosity, n	0.411	Conso.	14	Porosity, n	0.410
Saturation, Percent	84.9	Soil Specifi	c Gravity	Saturation, Percent	84.2
Hydraulic Gradient, i	9.8	Gs	2.665	Hydraulic Gradient, i	7.1
Sample Length, Inches	5.668	Proctor Re	ferenced	Sample Length, Inches	5.650
Sample Volume, cc	584.4856	-	-	Sample Volume, cc	583.5545
B-value :	97	.0%	Sample Co	onsolidated During Saturation, %	0.32%



Start	Cum.	Head	Hydraulic				
Test @	Time	Loss, ∆h2	Conducti	vity, k			
t=0	Δt, min.	psi	(Permea	bility)			
0	0.00	2.0000	cm/sec	°C			
1	0.08	1.9180	7.27E-04	20			
2	0.17	1.8429	7.10E-04	20			
3	0.25	1.7692	7.10E-04	20			
4	0.33	1.7053	6.92E-04	20			
5	0.42	1.6385	6.92E-04	20			
6	0.50	1.5746	6.92E-04	20			
7	0.58	1.5134	6.92E-04	20			
8	0.67	1.4550	6.91E-04	20			
9	0.00		20				

Hydraulic Conductivity, cm/sec 6.91E-04



200 Wellington Manor Court Suite 100 Alabaster, Alabama 35007

### **GRAIN SIZE DISTRIBUTION**



200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 U.S. SIEVE OPENING IN INCHES | 6 4 3 2 1.5 1 3/4 1/23/8 HYDROMETER 100 95 90 85 80 75 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine fine coarse coarse

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200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

### ATTERBERG LIMITS RESULTS

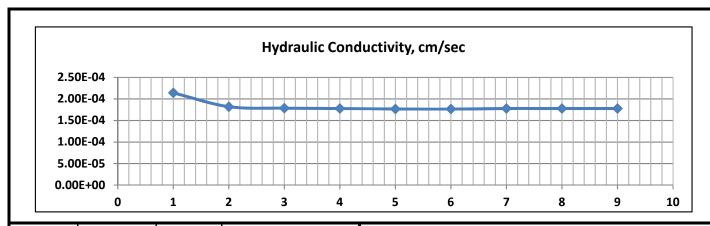
Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 30 I N D E X 20 10 CL-ML (ML) (MH) 20 40 100 60 80 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-17S NP NP NP SILTY SAND (SM-SC) 17 21

## Measurement of Hydraulic Conductivity of Saturated Porous Materials Using <u>a Flexible Wall Permeameter</u>

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-19S (17'-19')
Sample Location :	PZ-19S (17'-19') UD-01	Date Sampled:	09/21/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions	
Wet Density, pcf	112.9	Pressure	s, psi	Wet Density, pcf	110.9
Dry Density, pcf	85.5	Chamber	87	Dry Density, pcf	85.5
Moisture Content, %	32.1	Head	78	Moisture Content, %	29.7
Void ratio, e	0.956	Tail	76	Void ratio, e	0.956
Porosity, n	0.489	Conso.	10	Porosity, n	0.489
Saturation, Percent	89.9	Soil Specifi	c Gravity	Saturation, Percent	83.3
Hydraulic Gradient, i	9.9	Gs	2.681	Hydraulic Gradient, i	8.4
Sample Length, Inches	5.613	Proctor Re	ferenced	Sample Length, Inches	5.613
Sample Volume, cc 582.1245		-	-	Sample Volume, cc	582.1245
B-value :	98	.0%	Sample Co	onsolidated During Saturation, %	0.00%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	0.17	1.9513	2.14E-04	20
2	0.33	1.9180	1.82E-04	20
3	0.50	1.8804	1.79E-04	20
4	0.67	1.8429	1.78E-04	20
5	0.83	1.8068	1.77E-04	20
6	1.00	1.7706	1.77E-04	20
7	1.00	1.7692	1.78E-04	20
8	1.17	1.7331	1.78E-04	20
9	1.33	1.6983	1.78E-04	20

Hydraulic Conductivity, cm/sec 1.78E-04



200 Wellington Manor Court Suite 100 Alabaster, Alabama 35007

### **GRAIN SIZE DISTRIBUTION**



200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 3 4 6 100 95 90 85 80 75 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine coarse fine coarse

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200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

### ATTERBERG LIMITS RESULTS

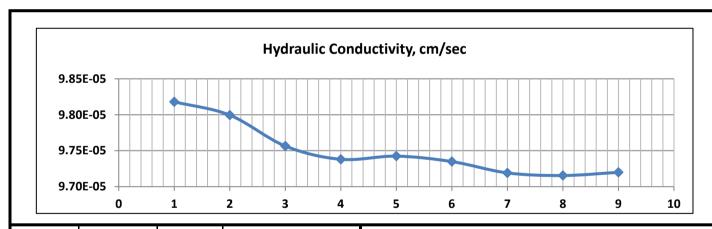
Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 30 I N D E X 20 10 CL-ML (ML) (MH) 20 40 100 60 80 LIQUID LIMIT %M Fines **BOREHOLE DEPTH** LL PL Ы Classification ● PZ-19S NP NP NP SILTY SAND (SM-SC) 17 42

## Measurement of Hydraulic Conductivity of Saturated Porous Materials Using <u>a Flexible Wall Permeameter</u>

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-20s (17'-19')
Sample Location:	PZ-20s (17'-19') UD-01	Date Sampled:	09/03/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions					
Wet Density, pcf	126.8	Pressure	s, psi	Wet Density, pcf	120.2				
Dry Density, pcf	98.4	Chamber	93	Dry Density, pcf	98.8				
Moisture Content, %	28.9	Head	79	Moisture Content, %	21.7				
Void ratio, e	0.690	Tail	77	Void ratio, e	0.683				
Porosity, n	0.408	Conso.	15	Porosity, n	0.406				
Saturation, Percent	111.5	Soil Specifi	c Gravity	Saturation, Percent	84.5				
Hydraulic Gradient, i	9.9 Gs 2.665		2.665	Hydraulic Gradient, i	8.2				
Sample Length, Inches	5.585	85 <b>Proctor Reference</b>		Sample Length, Inches	5.535				
Sample Volume, cc	569.1641	-	-	Sample Volume, cc	566.5934				
B-value :	100	0.0%	Sample Co	nsolidated During Saturation, %	0.90%				



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	0.33	1.9563	9.82E-05	20
2	0.67	1.9138	9.80E-05	20
3	1.00	1.8727	9.76E-05	20
4	1.33	1.8323	9.74E-05	20
5	1.67	1.7926	9.74E-05	20
6	2.00	1.7539	9.73E-05	20
7	2.33	1.7164	9.72E-05	20
8	2.67	1.6794	9.72E-05	20
9	3.00	1.6430	9.72E-05	20

Hydraulic Conductivity, cm/sec 9.72E-05



200 Wellington Manor Court Suite 100 Alabaster, Alabama 35007

### **GRAIN SIZE DISTRIBUTION**



200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 U.S. SIEVE OPENING IN INCHES | 6 4 3 2 1.5 1 3/4 1/23/8 HYDROMETER 100 95 90 85 80 75 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY

≂												
₹ Y	BOREHOLE	DEPTH			Classification	on		LL	PL	PI	С	Cu
· S	● PZ-20s	17		s	ILTY SAND	(SM-SC)		NP	NP	NP		
11:5												
(11)												
- 10/2												
פב												
ġ	•											
7	BODEHOLE	DEDTU	D100	Deo	D3U	D10	%Craval	0/Sano		0/. Cil+	0/- (	Clay

-S\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANYPLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS\GPJ	PERCENT FINER BY WEIGHT	70 - 65 - 60 - 55 - 50 - 45 - 35 - 30 - 15 - 10 - 5 - 0																																											
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- 10/27/15 11:27																																													
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GINTS													_	_	_	7	_	_	_	_																									
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ATTERBERG LIMITS - GINT STD US LAB. GDT - 10/27/15 11:27

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### ATTERBERG LIMITS RESULTS

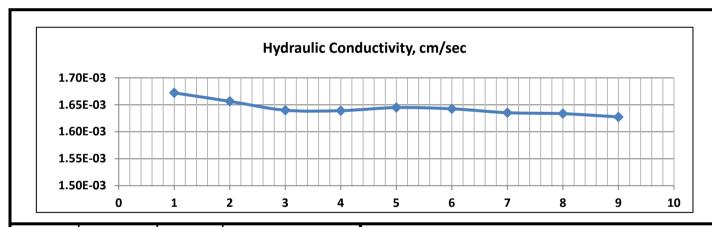
Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 - S:\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANYPLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS.GP、 30 I N D E X 20 10 CL-ML (ML) (MH) 20 40 60 80 100 LIQUID LIMIT %M Fines **BOREHOLE DEPTH** LL PL Ы Classification ● PZ-20s NP NP NP SILTY SAND (SM-SC) 17 29

## Measurement of Hydraulic Conductivity of Saturated Porous Materials Using <u>a Flexible Wall Permeameter</u>

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-22S (7'-9')
Sample Location:	PZ-22S (7'-9') UD-01	Date Sampled:	09/17/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions					
Wet Density, pcf	110.9	Pressure	s, psi	Wet Density, pcf	110.3				
Dry Density, pcf	83.5	Chamber	83	Dry Density, pcf	83.6				
Moisture Content, %	32.8	Head	78	Moisture Content, %	31.9				
Void ratio, e	1.040	Tail	76	Void ratio, e	1.038				
Porosity, n	0.510	Conso.	6	Porosity, n	0.509				
Saturation, Percent	86.2	Soil Specifi	c Gravity	Saturation, Percent	84.0				
Hydraulic Gradient, i	9.9	Gs	2.731	Hydraulic Gradient, i	8.4				
Sample Length, Inches	e Length, Inches 5.618 P		ferenced	Sample Length, Inches	5.600				
Sample Volume, cc	571.7477	-	-	Sample Volume, cc	570.8288				
B-value :	96	.0%	Sample Co	nsolidated During Saturation, %	0.32%				



Start	Cum.	Head	Hydraulic					
Test @	Time	Loss, ∆h2	Conducti	vity, k				
t=0	Δt, min.	psi	(Permea	bility)				
0	0.00	2.0000	cm/sec	°C				
1	0.02	1.9625	1.67E-03	20				
2	0.03	1.9263	1.66E-03	20				
3	0.05	1.8916	1.64E-03	20				
4	0.07	1.8568	1.64E-03	20				
5	0.08	1.8220	1.64E-03	20				
6	0.10	1.7887	1.64E-03	20				
7	0.12	1.7567	1.64E-03	20				
8	0.13	1.7247	1.63E-03	20				
9	0.15	1.6941	1.63E-03	20				

Hydraulic Conductivity, cm/sec 1.63E-03

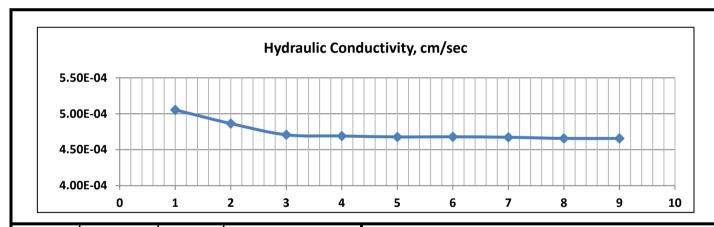


200 Wellington Manor Court Suite 100 Alabaster, Alabama 35007

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-22s (17'-19')
Sample Location :	PZ-22s (17'-19') UD-02	Date Sampled:	09/17/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions		
Wet Density, pcf	111.1	Pressure	s, psi	Wet Density, pcf	110.3	
Dry Density, pcf	82.5	Chamber	88	Dry Density, pcf	82.4	
Moisture Content, %	34.7	Head	78	Moisture Content, %	33.8	
Void ratio, e	1.056	Tail	76	Void ratio, e	1.057	
Porosity, n	0.514	Conso.	11	Porosity, n	0.514	
Saturation, Percent	89.4	Soil Specifi	c Gravity	Saturation, Percent	86.9	
Hydraulic Gradient, i	9.8	Gs	2.717	Hydraulic Gradient, i	7.8	
Sample Length, Inches	5.645	<b>Proctor Re</b>	ferenced	Sample Length, Inches	5.648	
Sample Volume, cc	572.9644			Sample Volume, cc	573.1166	
B-value :	99	.0% Samp		ole Swelled During Saturation, %	0.05%	



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permeability)	
0	0.00	2.0000	cm/sec	°C
1	0.08	1.9444	5.05E-04	20
2	0.17	1.8943	4.86E-04	20
3	0.25	1.8485	4.71E-04	20
4	0.33	1.8012	4.69E-04	20
5	0.42	1.7553	4.68E-04	20
6	0.50	1.7100	4.68E-04	20
7	0.58	1.6663	4.67E-04	20
8	0.67	1.6246	4.66E-04 20	
9	0.75	1.5829	4.66E-04	20

Hydraulic Conductivity, cm/sec 4.66E-04





)ITIONAL/BIRMINGHAM LAB/SOUTHERN COMPANY/PLANT YATES PIEZOMETERS/GINT/PLANT YATES PIEZOMETERS.GP.

200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775 Fay: 205-733-8954

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 3 4 6 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 100 95 90 85 80 75 70 65 PERCENT FINER BY WEIGHT × 60 55 50 45 40 35 30 25 20 15 10 5 0 100 10 0.1 0.01 0.001

COBBLES GRAVEL SAND	SILT OR CLAY					
COBBLES	coarse	fine	coarse	medium	fine	SILT OR CLAT

GRAIN SIZE IN MILLIMETERS

S:\TRAE	BOREHOLE	DREHOLE DEPTH Classification									СС	Cu
·   •	PZ-22S	7		SILTY SAND (SM-SC)						NP		
11:27	PZ-22S	17		S	ILTY SAND	(SM-SC)		NP	NP	NP		
10/27/15												
. 10/												
3.GDT												
US LAB	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	1	%Silt	%(	Clay
OTS •	PZ-22S	7	9.5	0.438	0.137		1.0	78.7		2	20.3	
GINTS	PZ-22S	17	9.5	0.235	0.082		1.3	70.7		2	28.0	
N SIZE						_						
GRAIN												

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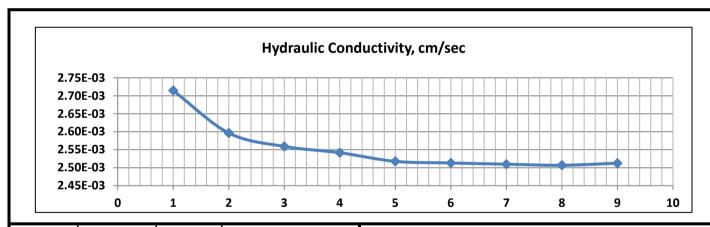
### **ATTERBERG LIMITS RESULTS**

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:28 - S.\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY/PLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS.GEV. 30 I N D E X 20 10 CL-ML (ML)(MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-22S NP NP NP SILTY SAND (SM-SC) 7 20 **▼** PZ-22S 17 NP NP NP 28 SILTY SAND (SM-SC)

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-24S (17'-19')
Sample Location:	PZ-24S (17'-19') UD-01	Date Sampled:	09/17/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions	Initial Working		Final Sample Conditions		
Wet Density, pcf	103.0	Pressure	s, psi	Wet Density, pcf	111.1
Dry Density, pcf	83.4	Chamber	90	Dry Density, pcf	83.4
Moisture Content, %	23.5	Head	79	Moisture Content, %	33.3
Void ratio, e	1.015	Tail	77	Void ratio, e	1.015
Porosity, n	0.504	Conso.	12	Porosity, n	0.504
Saturation, Percent	62.2	Soil Specifi	c Gravity	Saturation, Percent	88.2
Hydraulic Gradient, i	9.9	Gs	2.693	Hydraulic Gradient, i	7.7
Sample Length, Inches	5.587	Proctor Re	ferenced	Sample Length, Inches	5.583
Sample Volume, cc	566.4718			Sample Volume, cc	566.2689
B-value :	96	.0% Sample Co		nsolidated During Saturation, %	0.07%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permeability)	
0	0.00	2.0000	cm/sec	°C
1	0.02	1.9388	2.71E-03	20
2	0.03	1.8846	2.60E-03	20
3	0.05	1.8318	2.56E-03	20
4	0.07	1.7803	2.54E-03	20
5	0.08	1.7317	2.52E-03	20
6	0.10	1.6830	2.51E-03	20
7	0.12	1.6357	2.51E-03	20
8	0.13	1.5899	2.51E-03 20	
9	0.15	1.5440	2.51E-03	20

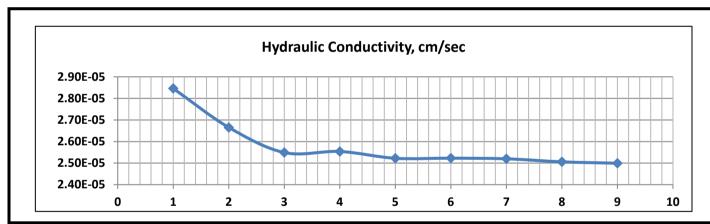
Hydraulic Conductivity, cm/sec 2.51E-03



ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-24S (37'-39')
Sample Location :	PZ-24S (37'-39') UD-02	Date Sampled:	09/16/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions	
Wet Density, pcf	109.6	Pressure	s, psi	Wet Density, pcf	112.3
Dry Density, pcf	90.6	Chamber	101	Dry Density, pcf	91.0
Moisture Content, %	21.0	Head	79	Moisture Content, %	23.3
Void ratio, e	0.860	Tail	77	Void ratio, e	0.851
Porosity, n	0.462	Conso.	23	Porosity, n	0.460
Saturation, Percent	66.0	Soil Specifi	c Gravity	Saturation, Percent	74.0
Hydraulic Gradient, i	9.6	Gs	2.701	Hydraulic Gradient, i	8.3
Sample Length, Inches	5.745	Proctor Re	ferenced	Sample Length, Inches	5.687
Sample Volume, cc	594.031			Sample Volume, cc	591.0023
B-value :	100	0.0% Sample Co		onsolidated During Saturation, %	1.01%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permeability)	
0	0.00	2.0000	cm/sec	°C
1	1.00	1.9611	2.85E-05	20
2	2.00	1.9277	2.67E-05	20
3	3.00	1.8971	2.55E-05	20
4	4.00	1.8638	2.55E-05	20
5	5.00	1.8332	2.52E-05	20
6	6.00	1.8015	2.52E-05	20
7	7.00	1.7706	2.52E-05	20
8	8.00	1.7414	2.51E-05 20	
9	9.00	1.7122	2.50E-05	20

Hydraulic Conductivity, cm/sec 2.50E-05

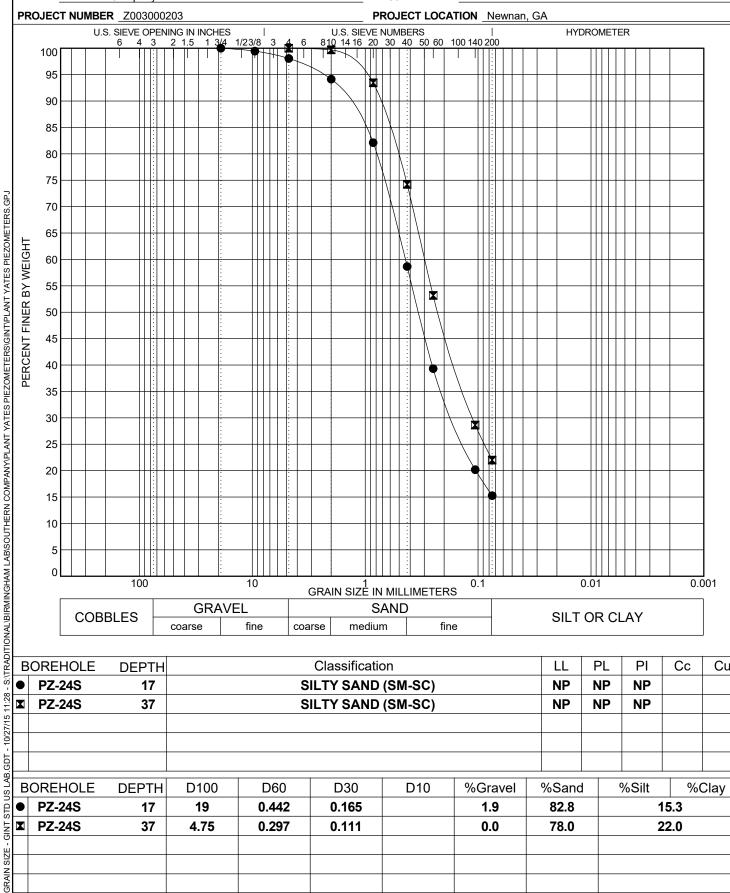




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**CLIENT** Southern Company Services

PROJECT NAME Plant Yates Piezometers



LE	BOREHOLE	DEPTH		Classification						PI	Сс	Cu
<b>E</b>	PZ-24S	17		SILTY SAND (SM-SC)						NP		
×	PZ-24S	37		SILTY SAND (SM-SC)						NP		
Е	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	1	%Silt	%(	Clay
•	PZ-24S	17	19	0.442	0.165		1.9	82.8		•	15.3	
	PZ-24S	37	4.75	0.297	0.111		0.0	78.0		:	22.0	
												-

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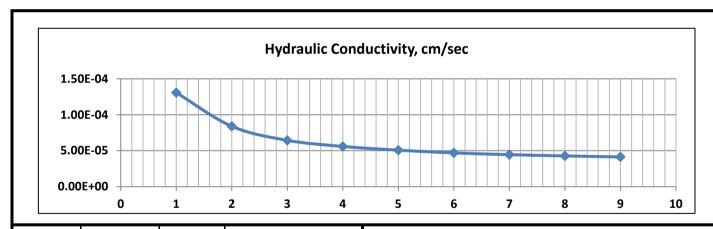
### **ATTERBERG LIMITS RESULTS**

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:28 - S.\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY/PLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS.GEV. 30 I N D E X 20 10 CL-ML (ML)(MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-24S NP NP NP SILTY SAND (SM-SC) 17 15 **▼** PZ-24S 37 NP NP NP 22 SILTY SAND (SM-SC)

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-25S (33'-35')
Sample Location:	PZ-25S (33'-35') UD-01	Date Sampled:	09/03/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial Working		Final Sample Conditions	
Wet Density, pcf	110.9	Pressure	s, psi	Wet Density, pcf	112.1
Dry Density, pcf	85.8	Chamber	98	Dry Density, pcf	86.1
Moisture Content, %	29.2	Head	79	Moisture Content, %	30.3
Void ratio, e	0.947	Tail	77	Void ratio, e	0.942
Porosity, n	0.486	Conso.	20	Porosity, n	0.485
Saturation, Percent	82.7	Soil Specifi	c Gravity	Saturation, Percent	86.1
Hydraulic Gradient, i	9.8	Gs	2.678	Hydraulic Gradient, i	7.7
Sample Length, Inches	5.635	Proctor Referenced		Sample Length, Inches	5.600
Sample Volume, cc	575.4849			Sample Volume, cc	573.6865
B-value :	97	.0% Sample Co		nsolidated During Saturation, %	0.62%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	1.00	1.8290	1.31E-04	20
2	2.00	1.7831	8.40E-05	20
3	3.00	1.7525	6.44E-05	20
4	4.00	1.7164	5.59E-05	20
5	5.00	1.6816	5.07E-05	20
6	6.00	1.6497	4.70E-05	20
7	7.00	1.6163	4.45E-05	20
8	8.00	1.5829	4.28E-05	20
9	9.00	1.5509	4.13E-05	20

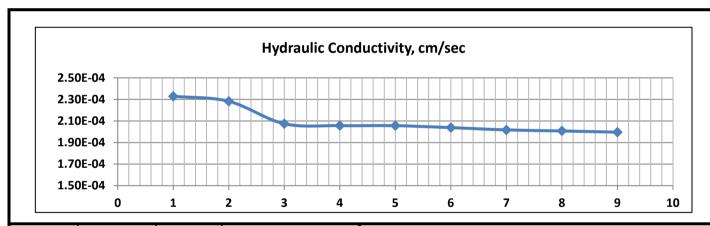
Hydraulic Conductivity, cm/sec 4.13E-05



ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-25S (44'-46')
Sample Location:	PZ-25S (44'-46') UD-02	Date Sampled:	09/03/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial Working		Final Sample Conditions	
Wet Density, pcf	118.4	Pressure	s, psi	Wet Density, pcf	119.4
Dry Density, pcf	97.9	Chamber	104	Dry Density, pcf	98.1
Moisture Content, %	21.0	Head	78	Moisture Content, %	21.7
Void ratio, e	0.710	Tail	76	Void ratio, e	0.706
Porosity, n	0.415	Conso.	27	Porosity, n	0.414
Saturation, Percent	79.2	Soil Specifi	c Gravity	Saturation, Percent	82.4
Hydraulic Gradient, i	9.9	Gs	2.682	Hydraulic Gradient, i	9.0
Sample Length, Inches	5.610	Proctor Re	ferenced	Sample Length, Inches	5.577
Sample Volume, cc	572.1864			Sample Volume, cc	570.4937
B-value :	97	.0% Sample Co		onsolidated During Saturation, %	0.59%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	0.08	1.9736	2.33E-04	20
2	0.17	1.9486	2.28E-04	20
3	0.25	1.9302	2.07E-04	20
4	0.33	1.9082	2.06E-04	20
5	0.42	1.8860	2.06E-04	20
6	0.50	1.8651	2.04E-04	20
7	0.58	1.8451	2.02E-04	20
8	0.67	1.8248	2.01E-04	20
9	0.75	1.8051	2.00E-04	20

Hydraulic Conductivity, cm/sec 2.00E-04





200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775 Fax: 205-733-8954

**CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES

6 4 3 2 1.5 1 3/4 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 3 1/23/8 100 95 90 85 80 75 GRAIN SIZE - GINT STD US LAB.GDT - 10/27/15 11:29 - SYTRADITIONALBIRMINGHAM LABISOUTHERN COMPANYIPLANT YATES PIEZOMETERSIGINTIPLANT YATES PIEZOMETERS. GPJ 70 65 PERCENT FINER BY WEIGHT 60 55 × 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine coarse fine coarse PODEHOLE

LE	BOREHOLE	DEPTH		Classification					PL	PI	Сс	Cu
•	PZ-25S	33		SILTY SAND (SM-SC)					NP	NP		
×	PZ-25S	44		S	ILTY SAND	(SM-SC)		NP	NP	NP		
Е	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand		%Silt	%(	Clay
•	PZ-25S	33	9.5	0.34	0.124		0.6	76.1		- :	23.4	
×	PZ-25S	44	19	0.306	0.109		3.8	73.9		:	22.3	
•												
												-

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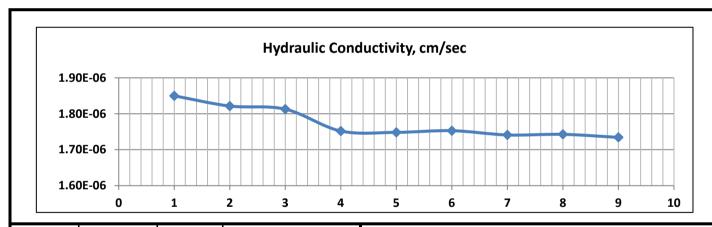
### **ATTERBERG LIMITS RESULTS**

Alabaster, Alabama 35007 Office: 205-738-8775 Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:29 - S.'TRADITIONAL'BIRMINGHAM LABISOUTHERN COMPANYIPLANT YATES PIEZOMETERS'GINTIPLANT YATES PIEZOMETERS GR. 30 I N D E X 20 10 CL-ML (ML)(MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-25S NP NP NP SILTY SAND (SM-SC) 33 23 **▼** PZ-25S 44 NP NP NP 22 SILTY SAND (SM-SC)

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-26S (17'-19')
Sample Location:	PZ-26S (17'-19') UD-01	Date Sampled:	9/31/2015
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial Working		Final Sample Conditions	
Wet Density, pcf	122.6	Pressure	s, psi	Wet Density, pcf	115.8
Dry Density, pcf	94.9	Chamber	92	Dry Density, pcf	95.2
Moisture Content, %	29.3	Head	79	Moisture Content, %	21.7
Void ratio, e	0.803	Tail	77	Void ratio, e	0.797
Porosity, n	0.445	Conso.	14	Porosity, n	0.443
Saturation, Percent	99.9	Soil Specifi	c Gravity	Saturation, Percent	74.5
Hydraulic Gradient, i	9.8	Gs	2.741	Hydraulic Gradient, i	8.9
Sample Length, Inches	5.645	Proctor Referenced		Sample Length, Inches	5.601
Sample Volume, cc	590.4383			Sample Volume, cc	588.1194
B-value :	100	0.0% Sample Co		nsolidated During Saturation, %	0.78%



Start	Cum.	Head	Hydraulic	
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	10.00	1.9741	1.85E-06	20
2	20.00	1.9494	1.82E-06	20
3	30.00	1.9249	1.81E-06	20
4	40.00	1.9038	1.75E-06	20
5	50.00	1.8807	1.75E-06	20
6	60.00	1.8574	1.75E-06	20
7	70.00	1.8357	1.74E-06	20
8	80.00	1.8131	1.74E-06	20
9	90.00	1.7920	1.73E-06	20

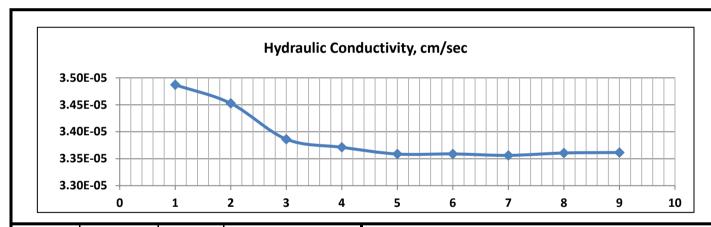
Hydraulic Conductivity, cm/sec 1.73E-06



ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-26S (27'-29')
Sample Location:	PZ-26S (27'-29') UD-02	Date Sampled:	9/31/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial Working		Final Sample Conditions	
Wet Density, pcf	120.1	Pressure	s, psi	Wet Density, pcf	119.2
Dry Density, pcf	92.5	Chamber	101	Dry Density, pcf	92.5
Moisture Content, %	29.8	Head	79	Moisture Content, %	28.8
Void ratio, e	0.834	Tail	77	Void ratio, e	0.834
Porosity, n	0.455	Conso.	23	Porosity, n	0.455
Saturation, Percent	97.1	Soil Specifi	c Gravity	Saturation, Percent	94.1
Hydraulic Gradient, i	9.8	Gs	2.720	Hydraulic Gradient, i	8.0
Sample Length, Inches	5.623	Proctor Re	ferenced	Sample Length, Inches	5.619
Sample Volume, cc	570.3925			Sample Volume, cc	570.1895
B-value :	100	0.0% Sample Co		nsolidated During Saturation, %	0.07%



Start	Cum.	Head	Hydraulic	
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	1.00	1.9538	3.49E-05	20
2	2.00	1.9096	3.45E-05	20
3	3.00	1.8685	3.39E-05	20
4	4.00	1.8273	3.37E-05	20
5	5.00	1.7873	3.36E-05	20
6	6.00	1.7475	3.36E-05	20
7	7.00	1.7089	3.36E-05	20
8	8.00	1.6705	3.36E-05	20
9	9.00	1.6332	3.36E-05	20

Hydraulic Conductivity, cm/sec 3.36E-05





200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

Fax: 205-733-8954 PROJECT NAME Plant Yates Piezometers **CLIENT** Southern Company Services PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 **HYDROMETER** 100 95 90 85 80 75 S:\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY,PLANT YATES PIEZOMETERS\G\INT\PLANT YATES PIEZOMETERS.GR, 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine fine coarse coarse Classification Сс **BOREHOLE** LL PL Ы Cu **DEPTH** • PZ-26s 17 SANDY SILT (ML) 37 27 10 - 10/27/15 11:29 **PZ-26s** 27  $\blacksquare$ SILTY SAND (SM-SC) NP NP NP US LAB.GDT **DEPTH BOREHOLE** D100 D60 D30 D10 %Gravel %Sand %Silt %Clay 42.1 57.9 GINT STD PZ-26s 17 4.75 0.081 0.0  $\blacksquare$ **PZ-26s** 27 4.75 0.138 0.0 66.3 33.7

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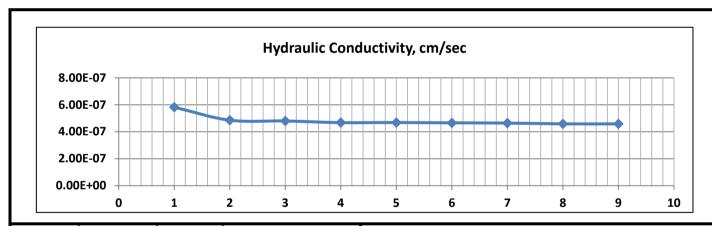
### **ATTERBERG LIMITS RESULTS**

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:29 - S.'TRADITIONAL'BIRMINGHAM LABISOUTHERN COMPANYIPLANT YATES PIEZOMETERS'GINTIPLANT YATES PIEZOMETERS GR. 30 I N D E X 20 10 CL-ML (ML) (MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-26s SANDY SILT (ML) 17 37 27 10 58 **▼** PZ-26s 27 NP NP NP 34 SILTY SAND (SM-SC)

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-27S (17'-19')
Sample Location:	PZ-27S (17'-19') UD-01	Date Sampled:	10/07/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions Initial Worki		orking	Final Sample Conditions		
Wet Density, pcf	126.5	Pressure	s, psi	Wet Density, pcf	126.1
Dry Density, pcf	99.6	Chamber	93	Dry Density, pcf	99.8
Moisture Content, %	27.0	Head	79	Moisture Content, %	26.3
Void ratio, e	0.667	Tail	77	Void ratio, e	0.663
Porosity, n	0.400	Conso.	15	Porosity, n	0.399
Saturation, Percent	107.7	Soil Specifi	c Gravity	Saturation, Percent	105.7
Hydraulic Gradient, i	9.8	Gs	2.661	Hydraulic Gradient, i	9.6
Sample Length, Inches	5.635	Proctor Re	ferenced	Sample Length, Inches	5.603
Sample Volume, cc	578.7582			Sample Volume, cc	577.1055
B-value :	97	.0%	Sample Co	onsolidated During Saturation, %	0.57%



Start	Cum.	Head	Hydraulic	
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	10.00	1.9917	5.82E-07	20
2	20.00	1.9861	4.86E-07	20
3	30.00	1.9794	4.80E-07	20
4	40.00	1.9733	4.68E-07	20
5	50.00	1.9666	4.68E-07	20
6	60.00	1.9602	4.66E-07	20
7	70.00	1.9538	4.64E-07	20
8	80.00	1.9480	4.58E-07	20
9	90.00	1.9416	4.58E-07	20

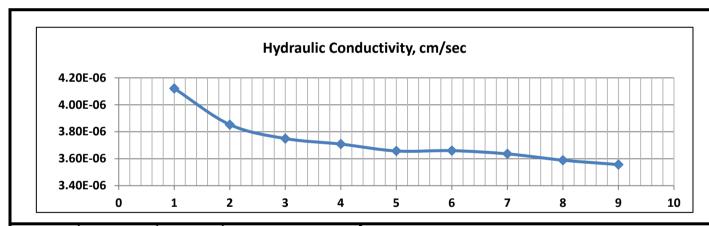
Hydraulic Conductivity, cm/sec 4.58E-07



ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-27S (27'-29')
Sample Location :	PZ-27S (27'-29') UD-02	Date Sampled:	10/07/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions Initial Working		Final Sample Conditions			
Wet Density, pcf	120.0	Pressure	s, psi	Wet Density, pcf	119.6
Dry Density, pcf	91.1	Chamber	98	Dry Density, pcf	91.3
Moisture Content, %	31.7	Head	79	Moisture Content, %	31.0
Void ratio, e	0.831	Tail	77	Void ratio, e	0.827
Porosity, n	0.454	Conso.	20	Porosity, n	0.453
Saturation, Percent	101.9	Soil Specifi	c Gravity	Saturation, Percent	100.2
Hydraulic Gradient, i	9.8	Gs	2.673	Hydraulic Gradient, i	8.8
Sample Length, Inches	5.657	Proctor Re	ferenced	Sample Length, Inches	5.629
Sample Volume, cc	576.1263			Sample Volume, cc	574.6934
B-value :	99	.0%	Sample Co	nsolidated During Saturation, %	0.49%



Start	Cum.	Head	Hydraulic	
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	5.00	1.9725	4.12E-06	20
2	10.00	1.9488	3.85E-06	20
3	15.00	1.9258	3.75E-06	20
4	20.00	1.9027	3.71E-06	20
5	25.00	1.8807	3.66E-06	20
6	30.00	1.8576	3.66E-06	20
7	35.00	1.8359	3.64E-06	20
8	40.00	1.8159	3.59E-06	20
9	45.00	1.7959	3.56E-06	20

Hydraulic Conductivity, cm/sec 3.56E-06





**PZ-27s** 

**PZ-27s** 

17

27

4.75

2

0.111

GINT STD

 $\blacksquare$ 

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Office: 205-738-8775 Fax: 205-733-8954 PROJECT NAME Plant Yates Piezometers **CLIENT** Southern Company Services PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 **HYDROMETER** 100 95 90 85 80 75 S:\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY,PLANT YATES PIEZOMETERS\G\INT\PLANT YATES PIEZOMETERS.GR, 70 65 PERCENT FINER BY WEIGHT 60 ¥ 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine fine coarse coarse Classification **BOREHOLE** LL PL Ы Сс Cu **DEPTH** • **PZ-27s** 17 SILT with SAND (ML) 39 30 9 - 10/27/15 11:29  $\blacksquare$ **PZ-27s** 27 NP NP NP SILTY SAND(SM-SC) US LAB.GDT **DEPTH BOREHOLE** D100 D60 D30 D10 %Gravel %Sand %Silt %Clay

73.5

45.0

0.0

0.0

26.5

55.0

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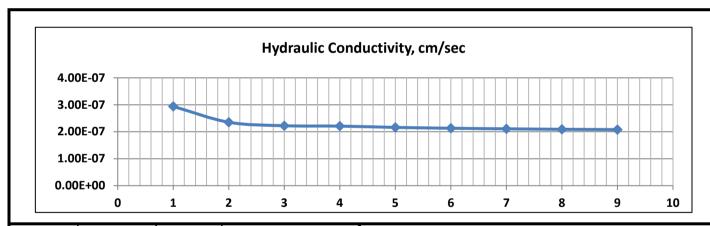
### **ATTERBERG LIMITS RESULTS**

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:29 - S.'TRADITIONAL'BIRMINGHAM LABISOUTHERN COMPANYIPLANT YATES PIEZOMETERS'GINTIPLANT YATES PIEZOMETERS GR. 30 I N D E X 20 10 CL-ML (ML)(MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-27s 39 30 SILT with SAND (ML) 17 9 74 **▼** PZ-27s 27 NP NP NP 45 SILTY SAND(SM-SC)

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-28S (17'-19')
Sample Location :	PZ-28S (17'-19') UD-01	Date Sampled:	No Date
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions		Initial W	orking	Final Sample Conditions	
Wet Density, pcf	124.6	Pressure	s, psi	Wet Density, pcf	126.0
Dry Density, pcf	100.8	Chamber	93	Dry Density, pcf	100.9
Moisture Content, %	23.6	Head	79	Moisture Content, %	24.9
Void ratio, e	0.597	Tail	77	Void ratio, e	0.594
Porosity, n	0.374	Conso.	15	Porosity, n	0.373
Saturation, Percent	102.2	Soil Specifi	c Gravity	Saturation, Percent	108.0
Hydraulic Gradient, i	9.9	Gs	2.578	Hydraulic Gradient, i	9.8
Sample Length, Inches	5.606	Proctor Re	ferenced	Sample Length, Inches	5.584
Sample Volume, cc	568.1281			Sample Volume, cc	567.0091
B-value :	99	.0%	Sample Co	nsolidated During Saturation, %	0.39%



Start	Cum.	Head	Hydraulic	
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permea	bility)
0	0.00	2.0000	cm/sec	°C
1	10.00	1.9958	2.94E-07	20
2	20.00	1.9933	2.35E-07	20
3	30.00	1.9905	2.22E-07	20
4	40.00	1.9875	2.21E-07	20
5	50.00	1.9847	2.16E-07	20
6	60.00	1.9819	2.13E-07	20
7	70.00	1.9791	2.11E-07	20
8	80.00	1.9764	2.09E-07	20
9	90.00	1.9736	2.08E-07	20

Hydraulic Conductivity, cm/sec 2.08E-07





200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775 Fay: 205-733-8954

Fax: 205-733-8954 PROJECT NAME Plant Yates Piezometers **CLIENT** Southern Company Services PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 **HYDROMETER** 1/23/8 3 100 95 90 85 80 75 S:\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY\PLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS.GP、 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine fine coarse coarse Classification Сс **BOREHOLE** LL PL Ы Cu **DEPTH PZ-28s** 17 SILTY SAND (SM-SC) NP NP NP US LAB.GDT - 10/27/15 11:30 -**DEPTH BOREHOLE** D100 D60 D30 D10 %Gravel %Sand %Silt %Clay PZ-28s 18.9 GINT STD 17 19 0.352 0.128 5.7 75.4

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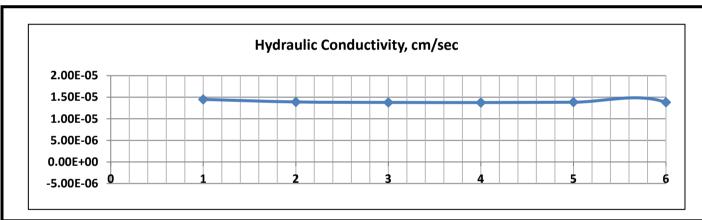
### ATTERBERG LIMITS RESULTS

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:30 - S./TRADITIONAL/BIRMINGHAM LAB/SOUTHERN COMPANY/PLANT YATES PIEZOMETERS/GINT/PLANT YATES PIEZOMETERS.GBV. 30 I N D E X 20 10 CL-ML (ML) (MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-28s NP NP NP SILTY SAND (SM-SC) 17 19

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203
Client :	Southern Company Services, INC	Sample Number :	PZ-30S (27'-29')
Sample Location :	PZ-30S (27'-29') UD-01	Date Sampled:	09/23/15
Northing:	Easting:	Elevation:	
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water

Initial Sample Conditions Initial Working		orking	Final Sample Conditions		
Wet Density, pcf	122.4	Pressure	s, psi	Wet Density, pcf	124.0
Dry Density, pcf	99.7	Chamber	101	Dry Density, pcf	100.5
Moisture Content, %	22.7	Head	79	Moisture Content, %	23.5
Void ratio, e	0.696	Tail	77	Void ratio, e	0.683
Porosity, n	0.410	Conso.	23	Porosity, n	0.406
Saturation, Percent	88.5	Soil Specifi	c Gravity	Saturation, Percent	93.1
Hydraulic Gradient, i	10.0	Gs	2.710	Hydraulic Gradient, i	7.5
Sample Length, Inches	5.538	Proctor Re	ferenced	Sample Length, Inches	5.450
Sample Volume, cc	580.1959			Sample Volume, cc	575.5133
B-value :	100	0.0%	Sample Co	nsolidated During Saturation, %	1.59%



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conducti	vity, k
t=0	Δt, min.	psi	(Permeability)	
0	0.00	2.0000	cm/sec	°C
1	5.00	1.8985	1.45E-05	20
2	10.00	1.8098	1.39E-05	20
3	15.00	1.7236	1.38E-05	20
4	20.00	1.6410	1.38E-05	20
5	25.00	1.5596	1.38E-05	20
6	30.00	1.4842	1.38E-05	20
7	0.00			20
8	0.00			20
9	0.00			20

Hydraulic Conductivity, cm/sec 1.38E-05





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**CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 100 95 90 85 80 75 GRAIN SIZE - GINT STD US LAB.GDT - 10/27/15 11:30 - S.\TRADITIONAL\BIRMINGHAM LAB\SOUTHERN COMPANY\PLANT YATES PIEZOMETERS\GINT\PLANT YATES PIEZOMETERS. GPJ 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine coarse fine coarse

₹ <b>⊢</b>												
E	BOREHOLE	DEPTH			Classification	on		LL	PL	PI	Сс	Cu
ó	PZ-30s	27		SILTY SAND (SM-SC)								
8												
10/2												
⊒ۈ										•		
	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	'	%Silt	%0	Clay
	PZ-30s	27	4.75	0.296	0.13		0.0	83.4		1	6.6	
N SIZE												
Z												

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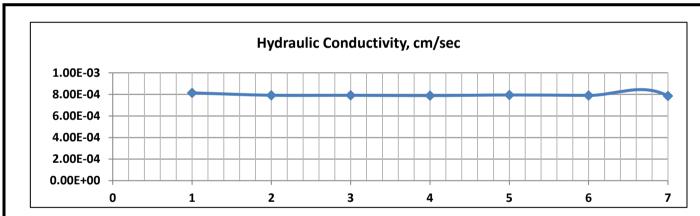
### ATTERBERG LIMITS RESULTS

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:30 - S./TRADITIONAL/BIRMINGHAM LAB/SOUTHERN COMPANY/PLANT YATES PIEZOMETERS/GINT/PLANT YATES PIEZOMETERS.GBV. 30 I N D E X 20 10 CL-ML (ML) (MH)20 40 60 80 100 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-30s NP NP NP SILTY SAND (SM-SC) 27 17

ASTM D 5084-10

Project :	Plant Yates Piezometers	Project Number:	Z003000203	
Client :	Southern Company Services, INC	Sample Number: PZ-31S (44'-46		
Sample Location :	PZ-31S (44'-46')	Date Sampled:	09/03/15	
Northing: -	Easting:	Elevation:		
Sample Preparation:	Shelby Tube Pushed	Permeant Liquid:	De-Aired Tap Water	

Initial Sample Conditions		Initial W	orking	Final Sample Conditions		
Wet Density, pcf	99.9	Pressure	s, psi	Wet Density, pcf	108.3	
Dry Density, pcf	79.1	Chamber	83	Dry Density, pcf	79.2	
Moisture Content, %	26.3	Head	79	Moisture Content, %	36.7	
Void ratio, e	1.092	Tail	77	Void ratio, e	1.089	
Porosity, n	0.522	Conso.	5	Porosity, n	0.521	
Saturation, Percent	63.8	Soil Specifi	c Gravity	Saturation, Percent	89.3	
Hydraulic Gradient, i	9.9	Gs	2.653	Hydraulic Gradient, i	7.2	
Sample Length, Inches	5.617	Proctor Re	ferenced	Sample Length, Inches	5.598	
Sample Volume, cc	583.669	-	-	Sample Volume, cc	582.6785	
B-value :	98	.0%	Sample Co	nsolidated During Saturation, %	0.34%	



Start	Cum.	Head	Hydra	ulic
Test @	Time	Loss, ∆h2	Conductivity, k	
t=0	Δt, min.	psi	(Permeability)	
0	0.00	2.0000	cm/sec	°C
1	0.08	1.9099	8.14E-04	20
2	0.17	1.8284	7.92E-04	20
3	0.25	1.7484	7.92E-04	20
4	0.33	1.6727	7.89E-04	20
5	0.42	1.5971	7.95E-04	20
6	0.50	1.5290	7.90E-04	20
7	0.58	1.4653	7.85E-04	20
8	0.67			20
9	0.75			20

Hydraulic Conductivity, cm/sec 7.85E-04





200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775 Fax: 205-733-8954

**CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 U.S. SIEVE NUMBERS | 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 100 95 90 85 80 75 GRAIN SIZE - GINT STD US LAB.GDT - 10/27/15 11:30 - S:TRADITIONALBIRMINGHAM LABISOUTHERN COMPANYIPLANT YATES PIEZOMETERSIGINTIPLANT YATES PIEZOMETERS.GPJ 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5 10 0.1 0.01 0.001 GRAIN SIZE IN MILLIMETERS **GRAVEL SAND COBBLES** SILT OR CLAY medium fine coarse fine coarse DODELIOLE

<u> </u>	BOREHOLE	DEPTH			Classification	on		LL	PL	PI	Сс	Cu
į 🗨	PZ-31s	7		S	ILTY SAND	(SM-SC)		NP	NP	NP		
S .												
10/2												
	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	ı	%Silt	%(	Clay
	PZ-31s	7	4.75	0.344	0.141		0.0	83.3		16.7		
N SIZE												
<u> </u>												

# Cardno

200 Wellington Court, Suite 100 Alabaster, Alabama 35007 Office: 205-738-8775

### ATTERBERG LIMITS RESULTS

Fax: 205-733-8954 **CLIENT** Southern Company Services PROJECT NAME Plant Yates Piezometers PROJECT NUMBER Z003000203 PROJECT LOCATION Newnan, GA 60 (CL) (CH) 50 LASTICITY 40 ATTERBERG LIMITS - GINT STD US LAB.GDT - 10/27/15 11:30 - S./TRADITIONAL/BIRMINGHAM LAB/SOUTHERN COMPANY/PLANT YATES PIEZOMETERS/GINT/PLANT YATES PIEZOMETERS.GBV. 30 I N D E X 20 10 CL-ML (ML) (MH)20 40 100 60 80 LIQUID LIMIT **BOREHOLE DEPTH** LL PL Ы %M Fines Classification ● PZ-31s NP NP NP SILTY SAND (SM-SC) 7 17

### APPENDIX C. BORING LOGS AND WELL CONSTRUCTION DIAGRAMS



STUDY.GP.

GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:25 - \\ALTRCFS02\X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL

## LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-4I
PAGE 1 OF 1
ECS37976

**PROJECT** Plant Yates Hydro-Geological Study SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING 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 EQUIPMENT PS-150 METHOD Rotosonic CONTRACTOR Cascade Drilling ANGLE BEARING DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY BORING DEPTH 46.5 ft. GROUND WATER DEPTH: DURING COMP. 17.72 ft. DELAYED **NOTES** Top of Casing Elevation = 784.21 STRATA DESCRIPTION **WELL DATA**  $\Xi$ GRAPHIC DEPTH Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (DEPTH) FLEV Sandy Silt (ML) -Surface Seal: concrete - rusty red, damp, medium stiff, low plasticity, very fine grain, 779.9 cohesive; micaceous; trace organics 779.4 (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, saprolite, noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace - SM: light brown to tan grading to reddish brown @ 15', damp, loose, no plasticity, lower fine to lower medium grain, saprolite, noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace mica 15 Annular Fill: 90/10 Portland - SM: reddish brown to tan to white with a greenish tan zone @ Cement/Bentonite Powder ▼ approx. 18-20', moist, medium dense, no plasticity, lower fine to upper medium grain, saprolite, visible zones where saprolite has not completely broken down to residual soil and remnant rock fabric visible; zone of more competent saprolite 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, saprolite, increasing rock fragment size and abundance with depth; rock fragments range from coarse gravel to cobble size; angular fragments 30 751.4 Interlayered Granitic Gneiss and Biotite Gneiss (30.6)- light gray to white with rusty red to orangish brown staining, lower -Annular Seal: 3/8 Hole Plug fine to lower medium grain, medium hard, moderately weathered, trace banding, quartz, biotite, muscovite, plagioclase, hornblende; low 35 747.4 to moderate angle fractures visible; slight schistose foliation visible in -Filter: 20/30 Silica Sand some weathered zones; some zones highly weathered (34.5)745.7 (36.2)Well: 2" OD PVC (SCH 40) 40 - 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, Screen: 10 ft; pre-pack 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 735.7 735.4 =Sump:0.30 ft.



2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:41 - \\ALTRCFS02X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

## LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5I

**PROJECT** Plant Yates Hydro-Geological Study SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING 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 **EQUIPMENT** PS-150 METHOD Rotosonic CONTRACTOR Cascade Drilling CHECKED BY \_\_\_\_\_ ANGLE \_\_\_\_\_ BEARING \_\_\_\_ DRILLED BY D. Wilcox LOGGED BY B. Smelser BORING DEPTH 56.5 ft. GROUND WATER DEPTH: DURING COMP. 13.66 ft. DELAYED **NOTES** Top of Casing Elevation = 784.54 STRATA DESCRIPTION **WELL DATA** Œ GRAPHIC DEPTH Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (DEPTH) ELEV. Silty Sand (SM) Surface Seal: concrete - brown, dry, medium dense, no plasticity, upper fine to lower medium 780.1 grain, noncohesive; trace organics; angular to sub angular grains - SM: brown, dry, medium dense, no plasticity, upper fine to lower 144 (2.0)medium grain, slight increase in clay content with depth; cohesive (slight); trace mica; trace coarse grains 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, saprolite, 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, saprolite, noncohesive; completely weathered to residual soil; angular to subangular grains 20 Annular Fill: 90/10 Portland Cement/Bentonite Powder 25 - SP: light gray to med gray, damp, loose, no plasticity, upper fine to lower medium grain, saprolite, increasing in gravel sized rock fragments (completely weathered, very brittle) 8 - SP: medium gray to light gray, damp, loose, no plasticity, upper fine to upper coarse grain, saprolite, noncohesive; completely weathered to residual soil with zones of more competent but brittle rock fragments; angular grains; micaceous



725.9

725.6

# SOUTHERN COMPANY

# 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

Sump:0.30 ft

DEPTH (ft) GRAPHIC LOG STRATA DESCRIPTION **WELL DATA** Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV (DEPTH ELEV Partially Weathered Rock 741.1 741.8 - light gray, Pulverized Rock (powder) due to sonic drilling; no (40.3)describable sample Annular Seal: 3/8 Hole Plug (medium bentonite chips) **Biotite Gneiss** - light brown to light gray to white, upper fine to upper medium grain, 737.6 medium hard to soft, moderately weathered, banded, quartz, biotite, muscovite, plagioclase, hornblende, trace chlorite; low to moderate Filter: 20/30 Silica Sand (44.5)angled fractures; no visible healing/fracture fill 735.9 (46.2)Well: 2" OD PVC (SCH 40) - 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; Screen: 10 ft; pre-pack 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

725.6

Bottom of borehole at 56.5 feet.



2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:56 - \\alphaLTRCFS02X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

# LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5D PAGE 1 OF 3 ECS37976

	2000	COMPANY	AND WELI	L INSTA	\LL/	ATION	J		
	SOUT	HERN COMPANY SERVICES	, INC.	PROJECT	Plant	Yates Hy	dro-Geological Study		
		H SCIENCE AND ENVIRON		LOCATION	New	nan, GA			
_									
		CARTED 4/11/2014 COM COR Cascade Drilling						4,396.67 E:2,076,223	5,63
		DBY D. Wilcox LOGG						REARING	
		DEPTH <u>126.5 ft.</u> GROU							
		Top of Casing Elevation = 784							
Œ	GRAPHIC LOG	STRATA	A DESCRIPTION				WELL	DATA	
DEPTH (ft)	LO 3					Surface:		n bollards; 4-foot squa	re
В	ত					concrete		r bollardo, i root oqua	ELEV.
	당성당년	Silty Sand (SM)			ELEV		T		(DEPTH)
		- brown, dry, medium dense	, no plasticity, upper fine to low ganics; angular to sub angular	er medium			Surface Seal: con	crete	779 9
		- SM: brown, dry, medium de	ense, no plasticity, upper fine t	o lower					(2.0)
		(slight); trace mica; trace co			770.0				
2	11 (11 ) 41	Poorly-graded Sand (SP)			776.9				
	  -	<ul> <li>light gray to off white, dry, value</li> <li>upper medium grain, noncol</li> </ul>	very loose, no plasticity, upper nesive; upper coarse to coarse	fine to					
		sized weathered rock fragments	ents; angular to subangular gra	ains;					
19		angular rock fragments							
			t gray /white with orangish brown, medium dense, no plasticity						
		fine to lower medium grain,	saprolite, noncohesive; comple	tely					
		weathered) rock increasing	ones of more competent (comp with depth; trace lenses of silt/	clay					
15		gravel sized rock fragments	saprolite; brittle upper coarse t included; micaceous	o lower					
		<ul> <li>SP: light gray/white grading gray mottling, damp, mediur</li> </ul>	g to med gray with orangish bro m dense, no plasticity, upper fir	own to dark ne to lower					
0		medium grain, saprolite, non residual soil; angular to suba	cohesive; completely weather	ed to					
×			gg				Annular Fill: 90/10	Dortland	
							Cement/Bentonite		
25									
			damp, loose, no plasticity, upp						
		lower medium grain, saprolit fragments (completely weath	e, increasing in gravel sized ro nered, very brittle)	ck					
8									
32		- SP: medium gray to light g	ray, damp, loose, no plasticity,	upper fine					
		to upper coarse grain, sapro	olite, noncohesive; completely more competent but brittle roo	weathered					
		fragments; angular grains; n		- •					
0	12.50					ユソノレーロン	<b>/</b>		



# LOG OF TEST BORING AND WELL INSTALLATION

BORING YGWA-5D PAGE 2 OF 3 ECS37976

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA

티우	STRATA DESCRIPTION		WELL DATA	
GRAPHIC			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		ELEV.	'	EL (DEP
	Biotite Gneiss		(CONTINUED)	
43	<ul> <li>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</li> </ul>			
	- 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		Annular Fill: 90/10 Portland	
	- 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		Cement/Bentonite Powder	
	- 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		Annular Seal: 3/8 Hole Plug (medium bentonite chips)	. 71 (69
s /	augen plagioclase surrounded by flaky/bladed habit biotite and muscovite, around the zones associated with the coarse grain			70
1/-	plagioclase		Filter: 20/30 Silica Sand	(74
	- 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		Screen: 50 ft; 0.01" slotted	70

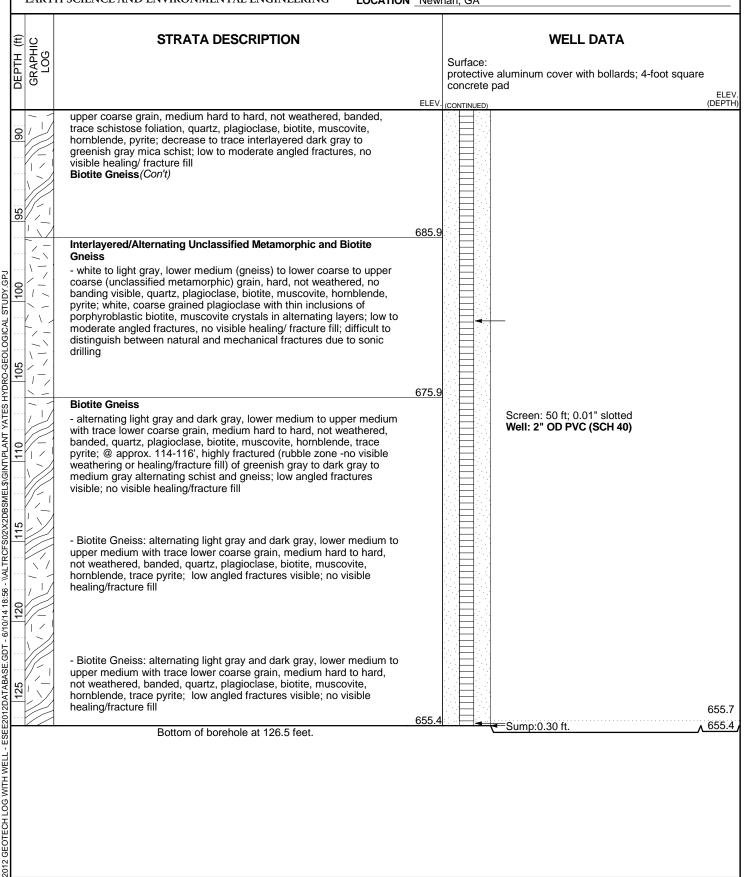


#### LOG OF TEST BORING AND WELL INSTALLATION

**BORING YGV** 

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Plant Yates Hydro-Geological Study

LOCATION Newnan, GA



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE. GDT - 11/15/15 12:03 - NALTRCFP01/WSHAUGNE\$/DESKTOP/PLANTS PROJECTS/GEORGIA POWER/YATES/2015 PIEZOMETERS/YATES 2015 PZS. GPJ

BORING YGWA-17S PAGE 1 OF 1 ECS37967

	(	COMPANY	Ī	LOG OF	ILSII	JUN	III			
SOU	JTHE	RN COMPANY S	SERVICES, INC.		PROJECT	CCR	Piezom	eters		
				ENGINEERING	LOCATION	l <u>Plan</u>	t Yates			
			COMPLETED						NATES: N:1,257,602.79 E:2,076,75	8.31
RILL	ED BY	Y L. Yancey	LOGGED BY	W. Shaughnessy	CHECKED B	Υ			ANGLE BEARING	
BORII	NG DE	<b>PTH</b> 37 ft.	<b>GROUND WATI</b>						DELAYED 10.3 ft. after 24 hrs.	
IOTE	s <u>lo</u>	p of casing elev	: 783.05							
(#)	GRAPHIC LOG		MATERIAL	DESCRIPTION		ELEVATION	Weak Moderate REACTION Strong	GROUNDWATER OBSERVATIONS	WELL DATA  Completion: protective aluminum cover with be 4-foot square concrete pad	ollards;
	114	Silty Sand (S	•	/ fine to coarse-grain	ned with mice	<b>.</b>			Surface Seal:	
5				y, fine to coarse-grain		1			concrete	
10		- pale brown	(10YR 6/3)							
15		- light reddish	n brown (2.5YR 7/3)	feldspar and quartz	seam				Annular Fill: cement-bentonite grout	
20		<u> </u>	a brown (2.5YR 7/4) e yellow (2.5Y 8/3)	wet and white / yellowisl	n gray (5Y 8/1	)				
25									Annular Seal:     bentonite pellets    Filter:     silica filter sand	
30			wn (2.5Y 5/2) sapro e yellow (2.5Y 7/3) a	lite and white / yellowisl	n gray (5Y 8/1	)			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack	
35										· • • •
	<u> </u>	1	Bottom of bo	orehole at 37.0 feet.			1 : : L		Sump:0.2999999999999999999999999999999999999	997 ft.



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE. GDT - 1/1/5/15 12:03 - NALTRCFP01/WSHAUGNE\$/DESKTOP/PLANTS PROJECTS/GEORGIA POWER/YATES/2015 PIEZOMETERS/YATES 2015 PZS.GPJ

## **LOG OF TEST BORING**

BORING YGWA-18S PAGE 1 OF 1 ECS37967

		••	MPAN	i.								
				ERVICES, INC.		PROJE	CT CCR	Piezom	eters			
EAR	CTH S	SCIE	NCE AND EN	IVIRONMENTAI	L ENGINEERING	LOCAT	ION Plan	t Yates				
			- 014/0045		0/0/00/15			_				= 0.0== 0.4= 0.5
					9/8/2015 SU					IATES:_	N:1,257,116.05	E: 2,077,015.25
				LOCCED BY	<del></del>					ANGLE	D	FADING
												EARING
			casing elev: 79		IER DEPTH: DURIN	<b>G</b> <u>10 II.</u>	COIVIF	<u>191</u>	ι.	_ DELATE	וס.ט וו. aile	er 24 hrs.
NOIE	<b>ن</b>	•										
DEPTH (ft)	GRAPHIC LOG				L DESCRIPTION		ELEVATION	Weak Moderate REACTION Strong	GROUNDWATER OBSERVATIONS	Comple protect 4-foots	WELL DATA etion: ive aluminum c square concrete	over with bollards;
		1	Clayey Sand (		- E						Surface Sea	al·
	//		- yellowish red	1 (5YR 5/8) dry, no	o, fine to medium-gr	rained					concrete	ai.
	//		- with mica									
5	//											
			dry, fine to me	ish yellow (7.5YR edium-grained, witl yellow (2.5Y 7/4)	t 6/8) and very pale h mica and very pale brow							
10			(101110,02)	'							Annular Fill: cement-ben	
20		<b>¥</b>	coarse-graine - pale olive (5 - mottled light 3/3)	d SY 6/3) very moist, yellowish brown(	(2.5Y 6/3) and white fine to medium-gra (2.5Y 6/3) and dark ark olive brown (2.5Y	ined olive brown	(2.5Y					
25			- wet								Annular Sea bentonite pe	
			- wet								silica filter s	and
30			mica	lusky yellow (5Y 6/	/4) saturated, fine to		ined, with				Standpipe:	
			- pale yellow		, , , , ,	( - /					2" OD PVC Screen: 10 ft; pre-pa	. ,
35			- banded olive	brown (2.5Y 4/4)	and white (N9)							
			- regolith									
	//i		- mottled pale		nd pale yellow (2.5						Sump:0.299	99999999999999999999999999999999999999
				Bottom of b	oorehole at 37.0 feet	Ι.						



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE. GDT - 1/1/5/15 12:03 - NALTRCFP01/WSHAUGNE\$/DESKTOP/PLANTS PROJECTS/GEORGIA POWER/YATES/2015 PIEZOMETERS/YATES 2015 PZS.GPJ

## **LOG OF TEST BORING**

BORING YGWA-18I PAGE 1 OF 2 ECS37967

		OMPANI					
		N COMPANY SERVICES, INC.	PROJECT CCF		ers		
EAR	TH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LOCATION Pla	nt Yates			
DATE	OTABT		DE ELEV. 707.0	000		- N	4 057 000 05 E 0 077 045 00
		ED         9/3/2015         COMPLETED         9/8/2015         SU           OR         Cascade         EQUIPMENT					
		L. Yancey LOGGED BY W. Shaughnessy	CHECKED BY				READING
		PTH 77 ft. GROUND WATER DEPTH: DURING					
		of casing elev: 790.57	5 CON	MF191t		LAILL	10.5 ft. after 24 fils.
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak HCL Moderate REACTION Strong	₹		WELL DATA  ion: e aluminum cover with bollards; uare concrete pad
		Clayey Sand (SC) - olive / light olive brown (5Y 5/6) moist, fine to coars	so grained				_Surface Seal:
		- onve / light onve brown (31 3/0) moist, line to coars	se-grained				concrete
5		Silty Sand (SM)					
		- mottled strong brown (7.5YR 5/6) and very pale b orange (10YR 7/4) dry, fine to coarse-grained, with r	rown / grayish nica				
10		- pale yellow (2.5Y 8/3) dry, some residual quartz gr	ravel				
10		- pale yellow (2.5Y 7/3)					
15		- mottled pale yellow (2.5Y 7/3) and yellow (2.5Y 7/3)	/6)				
		- mottled light brownish gray (2.5Y 6/2) and light gr	ay (2.5Y 7/1) damp				
		Clayey Silty Sand (SC-SM)					
20		<ul> <li>mottled pale yellow (2.5Y 7/4) and white / yellowis fine to coarse-grained, massive white quartz+feldsparent weathered), with mica</li> <li>mottled pale yellow (2.5Y 7/3) and white (2.5Y 8/2)</li> </ul>	ar (completely				Annular Fill: cement-bentonite grout
25		- white / yellowish gray (5Y 8/1) fine to coarse-graine quartz+feldspar (completely weathered), with mica - pale olive (5Y 6/3)	ed, massive white				
30		- banded light olive gray (5Y 6/2) and white (2.5Y 8 coarse-grained, with mica	s/1) wet, fine to				
35		- banded light yellowish brown (2.5Y 6/3) and white	: (2.5Y 8/1)				_
		- saprolite - mottled light gray (2.5Y 7/2) and white (2.5Y 8/1) grained	wet, fine to coarse-				



# SOUTHERN COMPANY

## **LOG OF TEST BORING**

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

LOCATION Plant Yates

-	EAF	пн	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION _	Plan	it Yates			
	Ε	HIC		NOI	HCL	/ATER		WELL DATA
	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak Moderate Strong	GROUNDWATER OBSERVATIONS		tive aluminum cover with bollards; square concrete pad
.015 PZS.GPJ			Clayey Silty Sand (SC-SM) (Con't) - mottled light gray (2.5Y 7/2) and white / yellowish gray (5Y 8/1) massive quartz+feldspar					
I EKS/YA I ES 2	45		- mottled dark yellowish brown (10YR 4/6) and very dark gray (10YF 3/1) weathered schist seam - mottled light gray (2.5Y 7/2) and white (2.5Y 8/1)	₹				
015 PIEZOME	50		Silty Sand (SM) - brown (10YR 5/3) wet, cohesive, fine to coarse-grained					
S		- /	Grantic gneiss					
OWERNYAIE			<ul> <li>transition zone, quartz, interbedded with mica schist</li> <li>pale yellow (2.5Y 7/3) slightly to completely weathered, with gravel silty sand (weathered zones)</li> <li>dark yellowish brown (10YR 4/6) and pale yellow (2.5Y 7/3) fine to</li> </ul>	-				Annular Fill: cement-bentonite grout
GEORGIA P	55		coarse grain, medium hàrd, slightlý to completely weathered					
S PROJECTS	60		- yellowish brown (10YR 5/6) and very dark greenish gray (10G 3/1 coarse grain, soft to medium hard, highly weathered, thinly foliated,	)				
(TOP/PLANI			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) sligh weathered - yellowish brown (10YR 5/6) and very dark gray (10YR 3/1) highly	ntly				
JGNE\$\DES	65		weathered  - highly weathered, water stained					Annular Seal: bentonite pellets _ Filter:
P01/WSHAL			- grayish brown (10YR 5/2) and black (5Y 2.5/1) coarse grain,					silica filter sand
	70		moderately weathered, thinly foliated, moderately fractured, fractures	;			目目	4
⋠	70		sub-horizontal - brownish yellow (10YR 6/8) and white (10R 8/1)					Standnine:
50		[\'/	- white (10R 8/1) massive feldspar and quartz seam					Standpipe: 2" OD PVC (SCH 40)
1/15/15 12		1-1	- grayish brown (10YR 5/2) and white (10R 8/1) massive quartzite seam					Screen: 10 ft; pre-pack
-	75		- thinly foliated					
SEGL			- bluish gray (5PB 6/1) and white (10R 8/1) not weathered, fresh competent rock					0 0000000000000000000000000000000000000
ABA		///	Bottom of borehole at 77.0 feet.		<u> </u>			Sump:0.2999999999999999999999999999999999999
빌								
	80							
≶  ⊑								
<u>₹</u>								
5	85							
<u> </u>								



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE. GDT - 1/1/5/15 12:04 - \\ALTRCFP01\WSHAUGNE\$\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS. GPJ

### **LOG OF TEST BORING**

BORING YGWA-20S PAGE 1 OF 1 ECS37967

		COMPANY	DOI			
SOI	JTHE	ERN COMPANY SERVICES, INC. PROJECT	T CCR	Piezome	eters	
		SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION	N Plan	t Yates		
DATE	STAR	RTED _9/28/2015 COMPLETED _9/29/2015 SURF. ELEV:	764.6	C	ORDINA	ATES: N:1,255,531.55 E: 2,077,410.37
		FOR Cascade EQUIPMENT N				
DRILL	ED B	Y L. Yancey LOGGED BY W. Shaughnessy CHECKED	BY			ANGLE BEARING
BORII	NG DE	EPTH 27 ft. GROUND WATER DEPTH: DURING _7 ft.				
NOTE	s To	op of casing elev: 767.12				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak Moderate REACTION Strong	GROUNDWATER OBSERVATIONS	WELL DATA  Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Clayey Silty Sand (SC-SM)		S ≥ Ø	00	X X
		<ul> <li>dark grayish brown (2.5Y 4/2) wet, fine grained</li> <li>very pale brown (10YR 7/3) and yellowish brown / moderate yellowish (10YR 5/4) fine to coarse-grained, with quartzite gravel</li> </ul>	ellowish			Surface Seal: concrete
5		- mottled very pale brown (10YR 7/3) and reddish yellow (7.5YR moist  ▼ - moist	7/8)			Annular Fill:
10		- mottled light yellowish brown (2.5Y 6/3) and pale yellow (2.5Y 6/3) wery moist, fine to coarse grained - dark grayish brown / dark yellowish brown (10YR 4/2) - mottled brownish yellow / dark yellowish orange (10YR 6/6) and (10YR 8/1)				_ Annular Seal:
15		Silty Sand (SM)  - mottled brownish yellow / dark yellowish orange (10YR 6/6) and (10YR 8/1) saprolite wet, fine to coarse-grained	white			bentonite pellets  Filter: silica filter sand
20		- light yellowish brown (2.5Y 6/3), pale yellow (2.5Y 8/2) and whit (2.5Y 8/1)	te			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, maweathered feldspar and quartzite	assive			Sump:0.30000000000001 ft.
		Bottom of borehole at 27.0 feet.				
30						
40						



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE. GDT - 1/1/5/15 12:04 - NALTRCFP01/WSHAUGNE\$/DESKTOP/PLANTS PROJECTS/GEORGIA POWER/YATES/2015 PIEZOMETERS/YATES 2015 PZS.GPJ

## **LOG OF TEST BORING**

BORING YGWA-21I PAGE 1 OF 2 ECS37967

		COMPANY					
		ERN COMPANY SERVICES, INC.  PROJECT _C					
EAF	CIHS	GCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION _F	Plant	t Yates			
DATE	STAR	RTED <u>9/23/2015</u> <b>COMPLETED</b> <u>9/28/2015</u> <b>SURF. ELEV.</b> <u>780.8</u>	8	C	OORDIN	NATES: N	l:1,255,538.27 E: 2,076,768.14
		OR Cascade EQUIPMENT METH					
DRILL	ED B	Y L. Yancey LOGGED BY W. Shaughnessy CHECKED BY				ANGLE	BEARING
		EPTH 77 ft. GROUND WATER DEPTH: DURING C	OMF	<b>P.</b> 24 f	t	DELAYE	<b>D</b> 24 ft. after 48 hrs.
NOTE	S'	op of casing elev: 783.7					
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak Moderate REACTION Strong	GROUNDWATER OBSERVATIONS		WELL DATA  tion: ve aluminum cover with bollards; quare concrete pad
	//	Clayey Sand (SC)					Surface Seal:
		- mottled strong brown (7.5YR 5/6) and yellowish red / light brown (5' 5/6) dry, fine to coarse-grained, mica					concrete
		Silty Sand (SM) - reddish yellow (7.5YR 6/8) soil fine to coarse-grained	_				
5		Well-graded Sand (SW) - very pale brown (10YR 7/3) fine to coarse-grained, mica, gravel (residual rock)					
		Poorly-graded Sand with Silt (SP-SM)					
10		- 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/saprolite weathered schist, feldsapr, quartz, fine to coarse-grained	/4)				
		Poorly-graded Sand with Silt (SP-SM)					
20		- 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					Annular Fill: cement-bentonite grout
		- mottled olive brown (2.5Y 4/3) and white (2.5Y 8/1)					ů
25		yellowish brown / moderate yellowish brown (10YR 5/4)					
		- mottled light olive brown (2.5Y 5/4) and pale yellow (2.5Y 8/3) mois highly decomposed mica scist	st,				
30		- mottled white (2.5Y 8/1) and pale brown (10YR 6/3) dry, highly decomposed granitic gneiss, feldspar quartz, mica					<b>←</b>
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. 7/2) and white (2.5Y 8/1)	.5Y				
	1/1/	- Bedrock transition zone					



### **LOG OF TEST BORING**

BORING YGWA-21I PAGE 2 OF 2 ECS37967

**PROJECT** CCR Piezometers SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING **LOCATION** Plant Yates HCL REACTION 3ROUNDWATER 3BSERVATIONS **WELL DATA** ELEVATION GRAPHIC LOG DEPTH (ft) MATERIAL DESCRIPTION Completion: protective aluminum cover with bollards: **Aoderate** 4-foot square concrete pad (Con't) SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 11/15/15 12:04 - \\ALTRCFP01\WSHAUGNESKTOP\PLANTS PROJECTS\GEORGIA POWER\YATES\2015 PIEZOMETERS\YATES 2015 PZS.GP. (2.5Y 8/1) and dark grayish brown (2.5Y 4/2) coarse grain, soft - white to hard, slightly to moderately weathered, medium to thick foliation, banded, moderately fractured (veritcal to sub-vertical) 45 - 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 50 foliation, banded, noderately fractured (near vertical), biotite gneiss Annular Fill: cement-bentonite grout 55 - 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 60 - pale yellow / grayish yellow (5Ý 8/4) Annular Seal: bentonite pellets 65 Filter: silica filter sand - 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) Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack 75 Sump:0.29999999999999 ft. Bottom of borehole at 77.0 feet. 80 85

### RECORD OF BOREHOLE YGWA-40/PZ-40

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

SHEET 1 of 1 DEPTH W.L.: 23.1 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: N/A

		SOII BBOEII E			TOC ELI				) IL	
_	N O	SOIL PROFILE		T			AMPLE	5	MONITORING	\A/E
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 —	-	0.00 - 2.00 sandy SILT, fine to medium sand, reddish brown, low plastic	SM							WELL CASING Interval: 0.0'-35.5' Material: Schedule 40 PV
-	- 810	2.00 - 6.00 fine to medium sand, light orange brown, micaceous, dry, loose			2.00	1		6.00		Diameter: 2" Joint Type: Threaded  WELL SCREEN
5 —	-				807.5					Interval: 35.5'-45.5' Material: U-Pack Schedu PVC Diameter: 2'
	- - - 805	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			6.00					Slot Size: 0.010" Slotted Screen End Cap: Schedule 40 P'
10 —	-							12.00		FILTER PACK Interval: 32.5'-46.0' Type: #1 Type Sand
-	-					2		10.00		FILTER PACK SEAL Interval: 27.0'-32.5 Type: Bentonite Pellets a
15 —	— 800 –								Portland _ Type 1	- Chips  - ANNULUS SEAL Interval: 0.0'-27.0' Type: Portland Type 1
-	-	16.00 - 17.00 coarse, competent		DA	797.5 16.00 796.5	_		3.00		Type: Portland Type 1  WELL COMPLETION Pad: 4'x4'x4" Protective Cooling: Alumi
-	— 795 —	17.00 - 19.00 transitionally weathered rock - highly weathered GNEISS, red, white, dark brown 19.00 - 36.00	PWR	14 A V	794.5 19.00	3		3.00	Portland _ Type 1	Protective Casing: Alumi  DRILLING METHODS  Soil Drill: 4" Sonic  Death Control of the Control o
20 —	-	highly weathered biotite GNEISS, oxidized staining								Rock Drill: 4" Sonic
-	- 790			20000000000000000000000000000000000000		4		7.00 7.00		_
25 —	-			7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4						
-	- - - 785			DVAVA & DVAVA					Bentonite Pellets and – Chips	_
30 —	-								Bentonite Pellets and – Chips	_
-	-			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	l .	5		10.00		_
35	— 780 –			44444444444444444444444444444444444444	1					
35 —		36.00 - 46.00 bedrock - biotite GNEISS, some weathering, trace pyrite		AAA V	777.5					
-	 775 								0.010" Slotted – Screen	_
40 —	-		GNEIS			6		9.00 10.00		-
-	- 770								#1 Type _ Sand	_
45 —	-				767.5				Sump –	
-	- - 765	Boring completed at 46.00 ft							, i	_
- 50 —	-									
		LE: 1 in = 6.5 ft COMPANY: Cascade Drilling			SPECT KED BY				es nan, PG	Golder
LOG DRII	LLING		(	CHEC		r: Ra				GCASS



### RECORD OF BOREHOLE YGWA-39/PZ-39

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

SHEET 1 of 2 DEPTH W.L.: 19.15 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: N/A

	z	SOIL PROFILE	SAMPLES							
(#)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0	<del>-</del> 815	0.00 - 0.40	TOPSOI		0.40	S			0000 0000 0000 0000 0000 0000	WELL CASING
5 —	- - - - - 810	topsoil 0.40 - 7.00 poorly sorted SAND with SILT, trace gravel, tan, mica fragments, dry, firm	SP-SM		5.40	1		7.00 7.00		Interval: 0.0'-55.5' Material: Schedule 40 PV( Diameter: 2" Joint Type: Threaded  WELL SCREEN Interval: 55.5'-65.5' Material: U-Pack Schedule
-	- -	7.00 - 17.00 some silt, tan, dry, firm			808.6					PVC Diameter: 2' Slot Size: 0.010" Slotted Screen End Cap: Schedule 40 PV
10 — - - -	- 805 - - -					2		10.00 10.00	Portland	FILTER PACK Interval: 52.5'-66.0' Type: #1 Type Sand  FILTER PACK SEAL Interval: 47.5'-52.5' Type: Bentonite Pellets and Chips
_ 15 — _ _	- 800 -	17.00, 40.00			798.6					ANNULUS SEAL Interval: 0.0'-47.5' Type: Portland Type 1 WELL COMPLETION Pad: 4'x4'x4"
- - 20 —	- - - 795	17.00 - 19.00 silty SAND, non-plastic fines, orange tan, micaceous, cohesive, firm  19.00 - 21.00 poorly graded SAND with SILT, non-plastic fines, moist, firm	SM SP-SM		796.6 19.00	3		4.00 4.00		Protective Casing: Alumin  DRILLING METHODS  Soil Drill: 4" Sonic  Rock Drill: 4" Sonic
-	- - -	21.00 - 24.00 silty SAND, 15-20% fines, orange tan with iron staining, wet (saprolite)	SM		794.6 21.00 791.6	. 4		6.00 6.00	Portland	
25 — - -	- 790 - -	24.00 - 29.00 SAND to silty SAND, some fines, mica, orange tan to tan, severely weathered fragements, dry to moist (saprolite)	SP-SM		24.00	*		6.00	Type 1	
30 —	- - 785 -	29.00 - 32.00 transitionally weathered rock - sand, some gravel, tan, rock seams, iron staining	1		783.6	5		3.80 6.00		
- 35 —	- - - 780	32.00 - 33.00 pulverized GNEISS, tan 33.00 - 37.00 bedrock - biotite GNEISS, fresh to medium weathered, medium strong to extremely strong, iron stains and deposits	GNEISS	D A	7 32.00 782.6 33.00	6		<u>4.00</u> 4.00		-
-	- - -	37.00 - 39.00 biotite GNEISS, severely weathered, iron staining and deposits  39.00 - 43.00 biotite GNEISS, severely weathered, sand layers noted iron staining			37.00 776.6 39.00					
40	775  -  -  -	and deposits 43.00 - 47.00			772.6 43.00					
45 — -	- 770 -	biotite GNEISS, severely weathered, iron staining and deposits			768.6					
50 —	-	47.00 - 57.00 biotite GNEISS, fresh to slightly weathered, medium strong to extremely strong  Log continued on next page			47.00	7		7.00 10.00	1/2"	
		LE: 1 in = 6.5 ft i COMPANY: Cascade Drilling			SPECTO KED BY			-	/issman nan, PG	Golder



# RECORD OF BOREHOLE YGWA-39/PZ-39 DRILL RIG: Sonic PS-150 DATE STARTED: 7/6/16 DATE COMPLETED: 7/7/16 RORTHING: 1,255,791.95 EASTING: 2,073,431.34 CS EL EVATION: 945.6

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

GS ELEVATION: 815.6 TOC ELEVATION: 818.19 ft

SHEET 2 of 2 DEPTH W.L.: 19.15 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: N/A

					- 100				0.1911	
	z	SOIL PROFILE		_		S	AMPLE	S		
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
50 <del>-</del>	<del></del> 765 -	47.00 - 57.00 biotite GNEISS, fresh to slightly weathered, medium strong to extremely strong (Continued)			(11)	S			Bentonite Pellets	WELL CASING Interval: 0.0'-55.5' Material: Schedule 40 PVC Diameter: 2"
- 55 — -	- - 760 -	57.00, 00.00			758.6	7		7.00 10.00		Joint Type: Threaded  WELL SCREEN Interval: 55.5'-65.5' Material: U-Pack Schedule 4 PVC Diameter: 2' Slot Size: 0.010" Slotted Screen
60 —	- - 755 -	57.00 - 66.00 bitite GNEISS, fresh to moderately weathered, discoloration, iron stains, medium strong to extremely strong			57.00	8		<u>5.00</u> 9.00	0.010"	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
65 —	- - 750 -	Boring completed at 66.00 ft			749.6				#1 Type _ Sand	Chips  ANNULUS SEAL Interval: 0.0'-47.5' Type: Portland Type 1  WELL COMPLETION
70 —	- - - 745 -								- - - - -	Pad: 4'x4'x4" Protective Casing: Aluminun  DRILLING METHODS  Soil Drill: 4" Sonic  Rock Drill: 4" Sonic
75 — — —	- 740  								- - - -	
80 —	- 735 - -								- - -	
85 — -	- - 730 - -								- - - -	
90 —	- - 725 - - -								- - - -	
95 — - - -	- 720 - -								- - - - -	
100 —	_								-	

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Tom Ardito

GA INSPECTOR: Courtney Vissman CHECKED BY: Rachel Kirkman, PG





## **LOG OF TEST BORING**

BORING YGWC-23S PAGE 1 OF 1 ECS37967

CONT DRILL BORII	RACT ED B'	RTED 9/18/2015 COMPLETED 9/21/2015 SURF. ELE  FOR Cascade EQUIPMENT  Y L. Yancey LOGGED BY W. Shaughnessy CHECI  EPTH 36 ft. GROUND WATER DEPTH: DURING 16 ft.	METHOD KED BY COM	Rotos	sonic	ANGLE BEARING	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA  Completion: protective aluminum cover with 4-foot square concrete pad	oollards
5		Clayey Sand (SC) - red (2.5YR 4/6) damp, fine to coarse-grained, with mica - mottled red (2.5YR 4/6) and reddish yellow (5YR 6/8)				Surface Seal: concrete	
10		Silty Sand (SM) - mottled red (2.5YR 4/6) and reddish yellow (5YR 6/8) dam coarse-grained, with mica	np, fine to			Annular Fill: cement-bentonite gro	ut
15		black (10YR 2/1) damp	′R 6/4) and				
20		- mottled brownish yellow (10YR 6/8) and white (2.5Y 8/1) v		_		Annular Seal: bentonite pellets	
25		Silty Sand (SM) - mottled light olive brown (2.5Y 5/4) and white (2.5Y 8/1) d coarse-grained, massive weathered feldspar and quartizite - mottled yellowish brown (10YR 5/6) and white (2.5Y 8/1)	ry, fine to			Filter: silica filter sand	
30		- mottled strong brown (7.5YR 5/6) and very pale brown / ve orange (10YR 8/2)	ery pale			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack	
35		- pale brown (10YR 6/3) damp				Sump:0.299999999999	

AF	CADI	S to reals	& Currenturing and and sets					Boring	g No.:_YGWC-24	SA	
				nstruction	Loa						
Project I	Name:	Plant	Yates	nistraction	Log		Date Started: 06/03/2020	│ Logger: <u>Clem</u>		2	
Project I						— Da	ate Completed: 06/04/2020		•		
1 1							•	Conditions: -			
Depth	Sample	Blow	Recovery	<b>D</b> 1 ( )	PID	Graphic			Construction		
(feet)	Interval	Counts	(in.)	Photo Log	(ppm)	Log	Description		Details	VV	/ell
0											ĺ
							(0.0-13.0') No recovery. Hydrovac to	13.0 ft bgs for	Surface		
' -	1						borehole clearance.		completion		
_ 2 _	]								consists of a locking		
_ 3 _	1								monument 3.00' above		
4 _	1								ground		
_ 5 _	1								surface with a weep hole,		
6	]								vent hole in		
F ° -	1								well casing, pea gravel		
<u></u>	1								between well		
8	]								monument and well		
9	1								casing,		
10	1								4'x4'x4" concrete pad,		
	1								and four		
11	1								concrete bollards.		- X
12											
13						TO SERVICE		(40) (5.0(0)	Portland		
14	<u> </u>						(13.0-16.0') Silty sand (SM); pale bro mottled with white (10YR 8/1); fine g	own (10YR 8/3) rained sand to	Cement with 6% Bentonite.		
15	1/ \						medium grained sand; very loose; m	ics present;	2 inch -		
L _	1/ \						weathered quartz vein present; sapro	olitic; moist.	diameter schedule 40		
16	K /						(16.0-19.0') Silty sand (SM); brownis	h yellow (10YR	PVC riser.		
17	<del> </del> \						6/8); trace clay; loose; slight plasticit moist.	y; mica present;			
18	1 \ /			医科学是			moist.				
	<u> </u>										
	1 A 1						(19.0-29.0') Silty sand (SM); brownis 6/8); fine grained to medium grained	h yellow (10YR			
5	1 / \						present; weathered quartz vein prese	ent; oxidised iron			
21	<u> </u>						present; saprolitic; dry.				
22	1/ \										
<u>23</u>	1/ \										
24	<b> </b>			(2) (S)							
25	1										
	1\ /										
26	1 / /			<b>在</b>							
27	7 \			77							
28	1 \ /										
	1 V I			. The second							
Drilling (	Co.:	Casc	ade Drilli	ng			Sampling Method <u>:Core E</u>	Barrel	1 1		
Driller:											
<u> </u>	Method:		-								
Drilling F	Fluid:	Wate					Water Level Finish (ft. bt				
Remark				= inch; bgs = below	ground	surface;		Yes	No		
NA = not	applicable	e / avai	lable.				Surface Elev.: <u>762.00</u>				
2							North Coor: <u>1258907.9</u>				
<u> </u>							East Coor: 2073924.8	1			

AR	CAD	IS	E Consultancy rel and					Boring	y No.: <u>YGWC-248</u>	SA
	ig Lo Name:	g/W Plant	ell Co	nstruction			Date Started: 06/03/2020 ate Completed: 06/04/2020	Logger: Clem	ent Papafio	2
1 1								onditions: -		
Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Construction Details	Well
							(29.0-39.0') Silty sand (SM); yellowish 5/8); fine grained to medium grained smedium dense; mica present; feldspared (34.0-36.0') Color change to dark brownedium dense; dry.  (36.0-39.0') Color change to white (10 oxidised iron present. (37.0-37.5') Weathered quartz vein.  (39.0-49.0') Silty sand (SM); mottled proceedings (10YR 6/3) with yellow (10YR 8/8/); mottled proceedings (10YR 6/3) with yellow	e gray (5Y 6/2); oose; mica	Portland Cement with 6% Bentonite. 2 inch diameter schedule 40 PVC riser.  Bentonite seal.  Filter pack: #1A (12-40) sand.  2 inch diameter Sch. 40 PVC U-Pack dual wall 0.010-inch slotted screen	
52  -  - 53  - 54				10						
55 56 57 58 59 60 61 62 64 62 64	-						End of boring 54.0 ft bgs.			
Remark	S:									

ARCADI	S for solution and tout south						Boring No.: YGWC-36A
Soil Borin	a Loa						Observe 4 of O
Soil Borin Project Name:	Yates			Da	ate Started: 09/21/2020	Logge	Sheet: 1 of 2 er: <u>Becky Steever</u>
					Completed: 09/22/2020		or: Geoff Gay
Project Location	: <u>Newnan, Geo</u> i	gia		_	Weather C	ondition	s: <u>Sunny &amp; Warm</u>
Depth Sample (feet) Interval	Blow Recovery Counts (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Well Construction TOC Elev. 740.88
1	Cascade				(0.0-8.0'): Fill, Silty Clayey Sand tan to orange-red; fine grained to medium grained sand; no staining/odor; wet  (8.0-10'); Sand; tan to medium grained sand; no staining/odor; some silt; moist (10-14'); Silty Sandy Clay; mottled gray; orange, tan, and brown; saprolite, relict structure; fine grained; dry  (14-35); Silty Sand (SM); medium brown; fine to medium grained sand staining/odor; wet	ay;	AQUAGUARD 30% Bentonite Solids  Riser
Drilling Co.:	Cascade				<ul><li>Sampling Method: <u>Cont.</u></li><li>Sampling Interval: <u>Cont.</u></li></ul>		
Drilling Method:	Sonic				Sampling Interval: <u>Cont.</u> Water Level Start: <u>14</u>		
Drilling Fluid:	None				Water Level Start. <u>14</u> Water Level Finish: <u>12.1</u>		
Remarks:						Yes	☐ No
					Surface Elev.: 737.7		
					North Coor.:125854	17.74	
					East Coor.: 207374		

AF	CAD	S	Consultance of and eta						Boring No.: YGW	C-36A
Soil I	3orin	a I c	na						Sheet: 2 of	2
Project I	Name:	Yates	<u>'9                                    </u>			Da	ate Started: 09/21/2020	Logger:	Becky Steever	
Project I							Completed: 09/22/2020		Geoff Gay	
Project I	Location	: Newr	nan, Geor	gia		-	Weather	Conditions:	Sunny & Warm	
Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Well Construction	1
Depth (feet)  - 36 37 38 39 40 41 42 44 45 46 51 50 51 55 56 57 58 57 58 59 60 61 - 61 - 62 61 - 62 66 67 68 67 68 67 68 67 71 68 67 71	Interval	Blow Counts	Recovery (in.)	Photo Log			Description  (35-38'); Silty Sand (SM); brown gray; fine to medium grained sa staining/odor; slightly moist  Same as above, some clay  Pulverized rock sand; pale gray some fine plagioclase gravel; fingrained sand	rnd; no	So. Products Filter Pack #1 (16-40)	Top of Screen  2" PVC Screen
72_										
Remark	⊥ s:									
	-									

### RECORD OF BOREHOLE YGWC-38/PZ-38

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 67.00 ft LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150 DATE STARTED: 7/20/16 DATE COMPLETED: 7/23/16

NORTHING: 1,256,108.38 EASTING: 2,074,446.80 GS ELEVATION: 797.1

SHEET 1 of 2 DEPTH W.L.: 26.35 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/23/2016 TIME W.L.: N/A

	N: Newnan, GA			TOC EL				9 ft
z	SOIL PROFILE				S	AMPLE	S	
DEPTH (ft) (ft) (ft) (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER CONSTRUCTION DIAGRAM and NOTES DETAILS
0	0.00 - 1.00 silty SAND, goethite, loose, moist 1.00 - 8.00 tan to brown, mottled, loose, dry	SM		796.10 1.00	1		<u>5.00</u> 7.00	WELL CASING Interval: 0.0'-37.0' Material: Schedule 40 PV Diameter: 2" Joint Type: Threaded  WELL SCREEN Interval: 37.0'-47.0' Material: U-Pack Schedule PVC Diameter: 2" Slot Size: 0.010'
790 10 785 15 780	8.00 - 9.00 white to tan, plagioclase, loose, dry 9.00 - 27.00 tan to brown, mottled, micaceous, loose, dry			789.10 8.00 788.10 9.00	2		<u>10.00</u> 10.00	WELL CASING Interval: 0.0'-37.0' Material: Schedule 40 PV Diameter: 2" Joint Type: Threaded  WELL SCREEN Interval: 37.0'-47.0' Material: U-Pack Schedul PVC Diameter: 2" Slot Size: 0.010' End Cap: Schedule 40 PV FILTER PACK Interval: 30.0'-48.0' Type: #1 Type Sand  FILTER PACK SEAL Interval: 30.0'-35.0' Type: Bentonite Pellets ar Chips  ANNULUS SEAL Interval: 0.0'-30.0' Type: Portland Type 1  WELL COMPLETION Pad: 4'x4'x4' Protective Casing: Alumin  DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
20 775 25				770.10	3		<u>10.00</u> 10.00	DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
770 30 765 35 720	27.00 - 34.00 brown to tan, relict structure, moist to wet, loose (saprolite)  34.00 - 37.00 transitionally weathered rock - weathered GNEISS to high grade SCHIST, garnet, muscovite, biotite, recrytallization, fractured, friable	PWR		763.10 34.00	4		<u>7.00</u> 10.00	Bentonite – Pellets – — — — — — — — — — — — — — — — — — —
40 755 45	37.00 - 39.00 bedrock - muscovite/biotite GNEISS, hornblende, fresh  39.00 - 40.00 muscovite/biotite GNEISS, hornblende, iron staining  40.00 - 56.00 muscovite/biotite GNEISS, hornblende, fresh	GNEIS		37.00 758.10 39.00 757.10 40.00	5		<u>7.00</u> 10.00	0.010" Slotted — Screen  #1 Type _ Sand
750   50	Log continued on next page				6		6.00 10.00	Sump -
DRILLING	LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Tom Ardito		CHEC	SPECT KED B\ : 9/29/1	/: Ra			nan, PG Golder



# RECORD OF BOREHOLE YGWC-38/PZ-38 DRILL RIG: Sonic PS-150 DATE STARTED: 7/20/16 DATE COMPLETED: 7/23/16 NORTHING: 1,256,108.38 EASTING: 2,074,446.80 GS EL EVATION: 707.1

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 67.00 ft LOCATION: Newnan, GA

GS ELEVATION: 797.1 TOC ELEVATION: 799.69 ft

SHEET 2 of 2 DEPTH W.L.: 26.35 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/23/2016 TIME W.L.: N/A

					TOC ELE			9 ft			
	z	SOIL PROFILE				S	AMPLE	S			
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
50 —	- 745	40.00 - 56.00 muscovite/biotite GNEISS, homblende, fresh (Continued)			(11)	o o			Bentonite Pellet Backfill	WELL CASING Interval: 0.0'-37.0' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded	
55 —	- - -	56.00 - 58.00			741.10	6		6.00 10.00	- - - -	WELL SCREEN Interval: 37.0'-47.0' Material: U-Pack Schedule PVC Diameter: 2" Slot Size: 0.010'	
60 —	— 740 - -	muscovite/biotite GNEISS, hornblende, iron staining  58.00 - 67.00 muscovite/biotite GNEISS, hornblende, fresh			739.10				- - -	FILTER PACK Interval: 35.0'-48.0' Type: #1 Type Sand	
-	- 735 					7		7.00 10.00	- - -	FILTER PACK SEAL Interval: 30.0'-35.0' Type: Bentonite Pellets and Chips	
65 —	- - -				730.10				- - -	ANNULUS SEAL Interval: 0.0'-30.0' Type: Portland Type 1  WELL COMPLETION Pad: 4'x4'x4"	
70 —	— 730   . - - -	Boring completed at 67.00 ft			755.10				- - - -	Protective Casing: Aluminu  DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic	
-	- 725 -								- - -		
75 <del>-</del>	- - - - 720								- - -		
80 —	- -								- -		
_	- 715 -								- - -		
85 — –	- - -								- - -		
90 —	710  								- - -		
-	- 705 -								- - -		
95 — -	- - - - 700								- - - -		
- 100 —	- - -								- - -		
DRI	LLING	LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Tom Ardito	(	CHEC	SPECT KED BY 9/29/1	r: Ra			/ nan, PG	Golder	



### RECORD OF BOREHOLE YGWC-41/PZ-41

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 64.50 ft LOCATION: Newnan, GA

DRILL RIG: Sonic PS-150 DATE STARTED: 7/7/16 DATE COMPLETED: 7/8/16

NORTHING: 1,256,510.62 EASTING: 2,073,274.41 GS ELEVATION: 801.1 TOC ELEVATION: 803.92 ft

SHEET 1 of 2 DEPTH W.L.: 22.1 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: 07:30

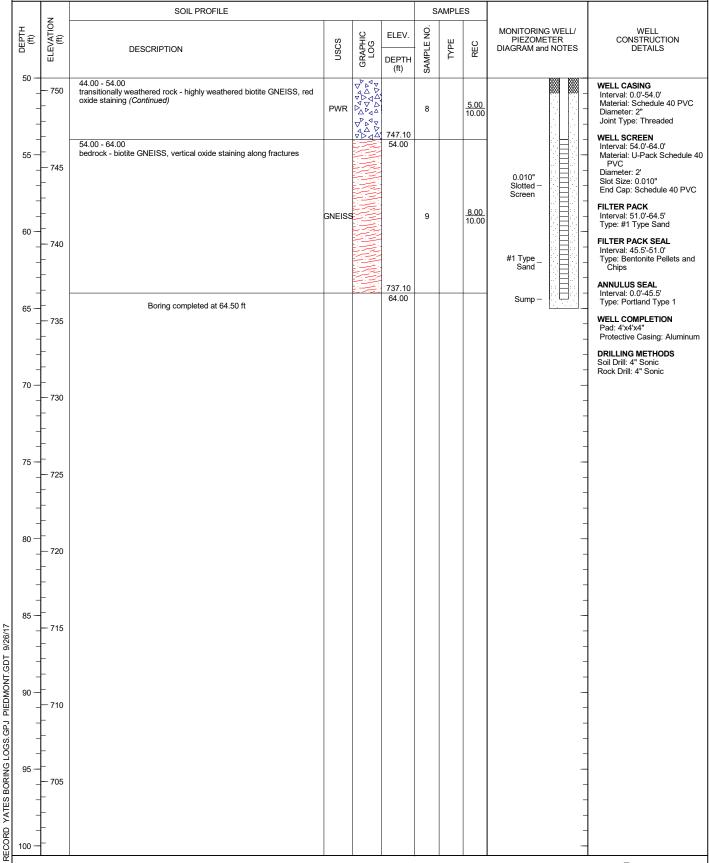
I		SOIL PROFILE			TOC EL	1	SAMPLE		2 IL	
_	NO	SOIL PROFILE			_		AWIFLE		MONITORING MELL	
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC	DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 -	- 800	0.00 - 2.00 sandy SILT, dark reddish brown, severely weathered gneiss, dry	ML		799.10			4.00		WELL CASING Interval: 0.0'-54.0' Material: Schedule 40 PVC
=	-	2.00 - 4.00 silty SAND, light brown, dry, non-cohesive	SM		2.00 797.10	1		4.00	200   200	Diameter: 2" Joint Type: Threaded WELL SCREEN
5 —	- 795	4.00 - 14.00 light brown, quartz sand at ~5', dry			4.00					Interval: 54.0'-64.0' Material: U-Pack Schedule PVC Diameter: 2' Slot Size: 0.010"
10 —	- - -					2		10.00 10.00		End Cap: Schedule 40 PV( FILTER PACK Interval: 51.0'-64.5' Type: #1 Type Sand
-	<del></del> 790 									FILTER PACK SEAL Interval: 45.5'-51.0' Type: Bentonite Pellets and Chips
15 —	-	14.00 - 24.00 light brown, dry			787.10 14.00					ANNULUS SEAL Interval: 0.0'-45.5' Type: Portland Type 1
-	785 									WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminu DRILLING METHODS
20 —	- - - 780					3		9.00 10.00		Soil Drill: 4" Sonic Rock Drill: 4" Sonic
-	- 760 - -								Portland Type 1	
25 —	-	24.00 - 29.00 trace gravel, sand coarsening, light brown, dry			777.10 24.00					
- - - - -	775 - -				772.10	4		<u>5.00</u> 5.00		
30 —	- 770 	29.00 - 38.00 transitionally weathered rock - highly weathered biotite/muscovite GNEISS	PWR		29.00	5		<u>5.00</u> 5.00	Portland _ Type 1	
35 —	- - 765 -				0 0 0 0	6		<u>5.00</u> 5.00		
-	-	38.00 - 39.00 more competent		D D D D D D D D D D D D D D D D D D D	△] 763.10				200 - 200 -	
40 —	- 760 - -	39.00 - 44.00 bedrock - biotite GNEISS, red to orange staining	GNEIS			7		<u>4.00</u> 5.00		
45 — 	- - 755 -	44.00 - 54.00 transitionally weathered rock - highly weathered biotite GNEISS, red oxide staining	PWR	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	757.10 V 44.00 A4.00	8		<u>5.00</u> 10.00		
50 —	-	Log continued on next page		D D D D D D D D D D D D D D D D D D D	<u></u>				Pellets and — Chips	-
		LE: 1 in = 6.5 ft COMPANY: Cascade Drilling			NSPECT				es nan, PG	Coldon
	LER:				: 9/29/			. ai Mi	··-···, · · ·	Golder Associate



### RECORD OF BOREHOLE YGWC-41/PZ-41

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 64.50 ft LOCATION: Newnan, GA DRILL RIG: Sonic PS-150 DATE STARTED: 7/7/16 DATE COMPLETED: 7/8/16

NORTHING: 1,256,510.62 EASTING: 2,073,274.41 GS ELEVATION: 801.1 TOC ELEVATION: 803.92 ft SHEET 2 of 2
DEPTH W.L.: 22.1 ft (bgs)
ELEVATION W.L.: (amsl)
DATE W.L.: 7/8/2016
TIME W.L.: 07:30



LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER:

GA INSPECTOR: Ben Hodges CHECKED BY: Rachel Kirkman, PG



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 57.00 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE

DRILL RIG: Sonic PS-150

DATE STARTED: 7/7/16

DATE COMPLETED: 7/8/16

DATE COMPLETED: 7/8/16

PGWC-42/ PZ-42

NORTHING: 1,256,882.87

EASTING: 2,073,326.52

GS EL EVALUON: 795.1 GS ELEVATION: 795.1 TOC ELEVATION: 797.86 ft

SHEET 1 of 2

DEPTH W.L.: 26.2 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: N/A

I		SOIL PROFILE								
_	Z O	SOIL PROFILE	1				AMPLE	-8		
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 -	<del></del> 795 - -	0.00 - 3.00 silty SAND, plastic fines, orange brown, micaceous, firm, decreasing moisture with depth	SM		792.10					WELL CASING Interval: 0.0'-47' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded
5 —	- - - 790	3.00 - 7.00 poorly graded SAND, some silt, tan to black, white to red, micaceous, dry	SP		3.00	1		7.00 7.00		WELL SCREEN Interval: 46.6'-56.6' Material: U-Pack Schedule PVC
	- - -	7.00 - 10.50 some silt, tan to black, white to red, dry			788.10					Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PV  FILTER PACK Interval: 46.0'-57.0'
10 -	785  	10.50 - 18.00 some silt, tan to black, white to red, increasing biotite, dry			784.60 10.50	2		10.00 10.00	Portland _ Type 1	Type: #1 Sand  FILTER PACK SEAL Interval: 37.5-46.0' Type: Bentonite Pellets and Chips
15 -	- 780 									ANNULUS SEAL Interval: 0.0'-37.5' Type: Portlant Type 1  WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminu
20 —	- - 775	18.00 - 19.00 silty SAND, red seam 19.00 - 27.00 poorlyly graded SAND, some silt, tan to black, white to red, plagioclase, dry	SM		777.10 18.00 776.10 19.00					DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
- - -	- - -		SP			3		10.00 10.00	Portland	
25	770  	27.00 - 30.00 no recovery			768.10					
30 -	- 765 - -	30.00 - 34.00 bedrock - biotite GNEISS, fresh to moderately weathered, medium strong to extremely strong, foliated	GNEIS		765.10 30.00	4		<u>5.00</u> 10.00		
35 —	- - - 760 -	34.00 - 37.00 biotite GNEISS, increased biotite, fresh to moderately weathered, medium strong to extremely strong, foliated			761.10 34.00					
	- - -	37.00 - 40.00 biotite GNEISS, fresh to moderately weathered, medium strong to extremely strong, fractured, foliated			758.10 37.00 755.10				Bentonite Pellets and — Chips	
40	755  	40.00 - 50.00 biotite GNEISS, fresh to moderately weathered, medium strong to extremely strong, foliated			40.00	5		<u>8.00</u> 10.00	- - -	
45 —	750 									
50 —	-	Log continued on next page			745.10	6		6.00 10.00	#1 Type	
DRIL	LING	LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Tom Ardito		CHEC		r: Ra			/issman nan, PG	Golder



### RECORD OF BOREHOLE YGWC-42/ PZ-42

DRILL RIG: Sonic PS-150 DATE STARTED: 7/7/16 DATE COMPLETED: 7/8/16

NORTHING: 1,256,882.87 EASTING: 2,073,326.52 GS ELEVATION: 795.1

SHEET 2 of 2

DEPTH W.L.: 26.2 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/8/2016 TIME W.L.: N/A

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 57.00 ft LOCATION: Newnan, GA TOC ELEVATION: 797.86 ft SOIL PROFILE SAMPLES ELEVATION (ft) DEPTH (ft) MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES WELL CONSTRUCTION Š GRAPHIC LOG ELEV. nscs TYPE SAMPLE REC DESCRIPTION **DETAILS** DEPTH (ft) 50 50.00 - 56.00 50.00 WELL CASING biotite GNEISS, fresh to moderately weathered, iron staining, medium strong to extremely strong, foliated Interval: 0.0'-47' Material: Schedule 40 PVC 0.010" Slotted Diameter: 2" Screen Joint Type: Threaded 6.00 10.00 6 WELL SCREEN Interval: 46.6'-56.6' Material: U-Pack Schedule 40 - 740 739.10 56.00 - 57.00 biotite GNEISS, fresh to moderately weathered, iron staining, medium strong to extremely strong, foliated, stained, fractured Slot Size: 0.010" End Cap: Schedule 40 PVC Boring completed at 57.00 ft FILTER PACK Interval: 46.0'-57.0' Type: #1 Sand 60 -- 735 FILTER PACK SEAL Interval: 37.5'-46.0' Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'-37.5' Type: Portlant Type 1 65 - 730 WELL COMPLETION Protective Casing: Aluminum DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic 70 -- 725 75 - 720 80 - 715 85 -- 710

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Tom Ardito

9/26/17

PIEDMONT.GDT

YATES BORING LOGS.GPJ 95 -<del>-</del> 700

100

- 705

GA INSPECTOR: Courtney Vissman CHECKED BY: Rachel Kirkman, PG



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 77.00 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE

DRILL RIG: Sonic PS-150

DATE STARTED: 7/8/16

DATE COMPLETED: 7/9/16

PGS FI EVALUATION: 742.3 GS ELEVATION: 742.3 TOC ELEVATION: 744.96 ft

SHEET 1 of 2

DEPTH W.L.: 30.5 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/9/2016 TIME W.L.: N/A

		SOIL PROFILE			100		AMPLE		14.96 ft	1		
ᅟ	<u>N</u>	COLLINOTIE					, uvii : LE		MONITORING WELL/	WELL		
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC	DEPTH (ft)	SAMPLE NO.	TYPE	REC	PIEZOMETER DIAGRAM and NOTES	CONSTRUCTION DETAILS		
0 -	745 	0.00 - 5.00 SAND to silty SAND, 10-15% fines, red to tan to brown, micaceous, dry to moist	SM						3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	WELL CASING Interval: 0.0'-66.5' Material: Schedule 40 PVC Diameter: 2"		
5 — -	- - 740 - -	5.00 - 6.00 10-15% fines, red to tan to brown, plagioclase, micaceous, dry to moist 6.00 - 14.00 10-15% fines, red to tan to brown, micaceous, dry to moist			737.30 5.00 736.30 6.00			8.00 8.00		Joint Type: Threaded  WELL SCREEN Interval: 66.5-75.5' Material: U-Pack Schedule PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC		
10 —	- 735 - -							8.00 9.00		Interval: 63,7'-77.0' Type: #1 Sand  FILTER PACK SEAL Interval: 58,5'-63,7' Type: Bentonite Pellets and Chips		
15 —	- - 730 -	14.00 - 28.00 transitionally weathered rock - feldspathic GNEISS, moderately to highly weathered, medium strong to extremely strong, discolored, iron stains and deposits			728.30					ANNULUS SEAL Interval: 0.0'-58.5' Type: Portlant Type 1  WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminu		
20 —	- - 725		PWR	O V V V V V V V V V V V V V V V V V V V				3.50 4.00		DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic		
25 —	- - - - - 720 -			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7744			3.00 8.00	Portland _ Type 1			
30 —	- - 715 -	28.00 - 33.00 bedrock - feldspathic GNEISS, fresh to slighly weathered, medium strong to extremely strong, discolored, iron stains and deposits	GNEIS		28.00				Portland Type 1			
- 35 —	- - 710 -	33.00 - 38.00 feldspathic GNEISS, fresh to lightly weathered, medium strong to extremely strong, fabric, discolored, some iron stains and deposits			709.30 33.00			10.00 10.00				
40 —	- - - - 705	38.00 - 77.00 feldspathic GNEISS, fresh, olive colored mineral, some garnet, quartz, biotite			704.30 38.00				·			
- - - 45 —	- - - - 700							10.00 10.00				
50 —	-	Log continued on next page						10.00				
DRII	LING	LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Tom Ardito		CHEC		/: Ra			Vissman nan, PG	Golder		



## RECORD OF BOREHOLE YGWC-43/ PZ-43

DRILL RIG: Sonic PS-150 DATE STARTED: 7/8/16 DATE COMPLETED: 7/9/16

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 77.00 ft

LOCATION: Newnan, GA

NORTHING: 1,257,547.41 EASTING: 2,073,199.65 GS ELEVATION: 742.3 TOC ELEVATION: 744.96 ft SHEET 2 of 2

DEPTH W.L.: 30.5 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/9/2016 TIME W.L.: N/A

SOIL PROFILE SAMPLES ELEVATION (ft) DEPTH (ft) MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES WELL CONSTRUCTION Š GRAPHIC LOG ELEV. nscs TYPE SAMPLE REC DESCRIPTION **DETAILS** DEPTH (ft) 50 10.00 - 695 38.00 - 77.00 WELL CASING feldspathic GNEISS, fresh, olive colored mineral, some garnet, Interval: 0.0'-66.5' Material: Schedule 40 PVC quartz, biotite (Continued) Diameter: 2" Joint Type: Threaded WELL SCREEN 10.00 10.00 Interval: 66.5'-75.5' Material: U-Pack Schedule 40 55 - 690 Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 63.7'-77.0' Type: #1 Sand 60 685 Bentonite Pellets and FILTER PACK SEAL Interval: 58.5'-63.7'
Type: Bentonite Pellets and Chips Chips ANNULUS SEAL Interval: 0.0'-58.5' Type: Portlant Type 1 10.00 10.00 680 WELL COMPLETION Protective Casing: Aluminum 0.010" DRILLING METHODS Slotted Screen Soil Drill: 4" Sonic Rock Drill: 4" Sonic 70 -675 #1 Type Sand 7.00 10.00 75 - 670 Sump 665.30 Boring completed at 77.00 ft 80 665 85 - 660 9/26/17 PIEDMONT.GDT 655 YATES BORING LOGS.GPJ 95 650 100

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Tom Ardito

GA INSPECTOR: Courtney Vissman CHECKED BY: Rachel Kirkman, PG



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 75.90 ft LOCATION: Newnan, GA

### RECORD OF BOREHOLE YGWC-49/ PZ-49

DRILL RIG: Sonic PS-150 DATE STARTED: 7/12/16 DATE COMPLETED: 7/13/16

NORTHING: 1,259,375.23 EASTING: 2,074,337.51 GS ELEVATION: 780.1 TOC ELEVATION: 782.73 ft SHEET 1 of 2

DEPTH W.L.: 26.95 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/13/2016 TIME W.L.: 15:26

DESCRI 0 - 0.00 - 10.00 No recovery; Hydrovac - 775 - 775		SOSO	GRAPHIC	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0		nscs	GRAPHIC LOG	DEPTH	SAMPLE NO	TYPE	REC	PIEZOMETER	CONSTRUCTION
No recovery; Hydrovac				, ,					
5 — 775 								# 10 m	WELL CASING Interval: 0.0'-65.4' Material: Schedule 40 PV
5 — 775									Diameter: 2" Joint Type: Threaded
<u> </u>									WELL SCREEN   Interval: 65.4-75.4   Material: U-Pack Schedul   PVC
_									Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 P\
10 - 770				770.0					FILTER PACK Interval: 63.3'-75.9' Type: #1 Sand
10.00 - 16.00	greyish brown to reddish brown, ee			10.00					FILTER PACK SEAL Interval: 58.7'-62.2' Type: Bentonite Pellets a Chips
705		SM			1		6.00		ANNULUS SEAL Interval: 0.0'-58.7' Type: N/A
15 — 765 16.00 - 26.00 No recovery due to soi	washing out of core barrel			764.0 16.00					WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Alumin
<u> </u>	-								DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
20 760					2		<u>0.00</u> 10.00		_
†									_
25 - 755				754.0				Portland	
26.00 - 36.00 silty SAND, dark browr weathered schist, dry,	to grayish brown, relict laminations, fully loose (saprolite)			26.00				Portland _ Type I	-
30 — 750							10.00		_
		SM			3		10.00		
35 — 745									
36.00 - 46.00 softer zone				774.0 36.00					_
10 - 740									_
40 740					4		9.00 10.00		
-									
45 — 735 46.00 - 54.00				734.0				XII	_
some silt and some gra	avel increasing with depth, mottled dark laminations, dry, loose (saprolite)	SP			5		8.00 8.00		-
				1 1			ı	. [0000] [0000]	

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Dale

BOREHOLE

GA INSPECTOR: Ben Hodges CHECKED BY: Rachel Kirkman, PG



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 75.90 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE

DRILL RIG: Sonic PS-150

DATE STARTED: 7/12/16

DATE COMPLETED: 7/13/16

PART OF BOREHOLE

NORTHING: 1,259,375.23

EASTING: 2,074,337.51

CS ELEVATION: 780.1

GS ELEVATION: 780.1 TOC ELEVATION: 782.73 ft SHEET 2 of 2

DEPTH W.L.: 26.95 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/13/2016 TIME W.L.: 15:26

				100	ELE	VATIC	IN: /C	02.73 IL	
	SOIL PROFILE		S.	AMPLE	S				
(ft) ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
50	46.00 - 54.00 some silt and some gravel increasing with depth, mottled dark brown to orange, relict laminations, dry, loose (saprolite) (Continued)	SP		726.0	5		8.00 8.00		WELL CASING Interval: 0.0-65.4' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded
55 — 725      60 — 720	54.00 - 65.00 transitionally weathered rock -biotite mica SCHIST, deeply stained, highly weathered, friable	PWR		4	6		<u>0.50</u> 11.00		WELL SCREEN Interval: 65.4-75.4 Material: U-Pack Schedule PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PV FILTER PACK Interval: 63.3'-75.9' Type: #1 Sand FILTER PACK SEAL
   65 715	65.00 - 76.00 highly fractured		VA V						Interval: 58.7'-62.2' Type: Bentonite Pellets ar Chips  ANNULUS SEAL Interval: 0.0'-58.7' Type: N/A  WELL COMPLETION Pad: 4'X4'X4"
70 — 710 —			20		7		<u>2.00</u> 11.00	#1 Sand	Protective Casing: Alumin  DRILLING METHODS  Soil Drill: 4" Sonic  Rock Drill: 4" Sonic
75 - 705	Boring completed at 75.90 ft			704.0 76.00				Sump –	
80 700	<b>3</b> 1							- - - - - - -	
85 - 695								- - - - - -	
95 — 685								- - -	
   								- - - -	
								- - - -	

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Dale

GA INSPECTOR: Ben Hodges CHECKED BY: Rachel Kirkman, PG





12 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 19:09 - \\ALTRCFS02X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GP.

## LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-4S PAGE 1 OF 1 ECS37976

AND WELL INSTALLATION **PROJECT** Plant Yates Hydro-Geological Study SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Newnan, GA DATE STARTED 4/11/2014 COMPLETED 5/21/2014 SURF. ELEV. 781.8 COORDINATES: N:1,254,442.86 E:2,075,454.20 EQUIPMENT PS-150 METHOD Rotosonic CONTRACTOR Cascade Drilling \_\_ ANGLE \_\_\_\_\_ BEARING \_\_ **DRILLED BY** D. Wilcox LOGGED BY B. Smelser CHECKED BY \_ BORING DEPTH 30.3 ft. GROUND WATER DEPTH: DURING \_\_\_\_\_ COMP. 18.98 ft. DELAYED \_\_\_ **NOTES** Top of Casing Elevation = 784.25 STRATA DESCRIPTION **WELL DATA** Œ GRAPHIC DEPTH Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (DEPTH) FLEV Sandy Silt (ML) - rusty red, damp, medium stiff, low plasticity, very fine grain, Surface Seal: concrete cohesive; micaceous; trace organics 779.3 (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 2 - SM: medium to light brown to tan, dry, loose, no plasticity, lower fine to lower medium grain, saprolite, noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace Annular Fill: 90/10 Portland Cement/Bentonite Powder - SM: light brown to tan grading to reddish brown @ 15', damp, loose, no plasticity, lower fine to lower medium grain, saprolite, noncohesive; completely weathered to residual soil; noncohesive; trace rock fragments (brittle); trace mica 15 (14.5)Annular Seal: 3/8 Hole Plug (medium - SM: reddish brown to tan to white with a greenish tan zone @ bentonite chips) approx. 18-20', moist, medium dense, no plasticity, lower fine to upper medium grain, saprolite, visible zones where saprolite has not 763.6 completely broken down to residual soil and remnant rock fabric visible; zone of more competent saprolite observed; gravel sized rock (18.2)fragments included; muscovite, biotite, chlorite phyllosilicates visible ⊢Filter: 20/30 Silica Sand ... 761.8 (20.0)Well: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack - SM: orangish brown to light gray to white, moist, medium dense, no plasticity, lower fine to upper medium grain, *saprolite*, increasing rock fragment size and abundance with depth; rock fragments range from coarse gravel to cobble size; angular fragments 751.8 751.5 **Sump:**0.30 ft. **7**51.5 Bottom of borehole at 30.3 feet.



2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 18:37 - \\ALTRCFS02X2DBSMEL\$\G\NT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

## LOG OF TEST BORING AND WELL INSTALLATION

BORING PZ-5S PAGE 1 OF 1 ECS37976

**PROJECT** Plant Yates Hydro-Geological Study SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Newnan, GA **DATE STARTED** 4/10/2014 **COMPLETED** 5/21/2014 **SURF. ELEV.** 782.2 **COORDINATES:** N:1,254,404.42 E:2,076,211.43 EQUIPMENT PS-150 METHOD Rotosonic CONTRACTOR Cascade Drilling ANGLE BEARING **DRILLED BY** D. Wilcox LOGGED BY B. Smelser CHECKED BY BORING DEPTH 39.5 ft. GROUND WATER DEPTH: DURING COMP. 13.53 ft. DELAYED **NOTES** Top of Casing Elevation = 784.64 STRATA DESCRIPTION **WELL DATA** Œ GRAPHIC DEPTH ( Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (DEPTH) FLEV Silty Sand (SM) Surface Seal: concrete - brown, dry, medium dense, no plasticity, upper fine to lower medium grain, noncohesive; trace organics; angular to sub angular grains 780.2 - SM: brown, dry, medium dense, no plasticity, upper fine to lower 144 (2.0)medium grain, slight increase in clay content with depth; cohesive (slight); trace mica; trace coarse grains 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, saprolite, noncohesive; completely Annular Fill: 90/10 Portland weathered to residual soil; zones of more competent (completely weathered) rock increasing with depth; trace lenses of silt/clay Cement/Bentonite Powder interbedded within the sand/saprolite; brittle upper coarse to lower 5 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, saprolite, noncohesive; completely weathered to residual soil; angular to subangular grains 2 758.5 (23.7)25 Annular Seal: 3/8 Hole Plug (medium bentonite chips) - SP: light gray to med gray, damp, loose, no plasticity, upper fine to 754.8 lower medium grain, saprolite, increasing in gravel sized rock -Filter: 20/30 Silica Sand (27.4)fragments (completely weathered, very brittle) 8 753.0 (29.2)Well: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack 35 - SP: medium gray to light gray, damp, loose, no plasticity, upper fine to upper coarse grain, saprolite, noncohesive; completely weathered to residual soil with zones of more competent but brittle rock fragments; angular grains; micaceous 743.0 742.7 Sump:0.30 ft. 742.7



GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 17:32 - NALTRCFS02\X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

## LOG OF TEST BORING

**BORING YGWA-6S/PZ-6S** 

**PAGE 1 OF 1** 

AND WELL INSTALLATION ECS37976 **PROJECT** Plant Yates Hydro-Geological Study SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Newnan, GA **COORDINATES:** N: 1,260,484.87 E: 2,074,786.49 **DATE STARTED** 4/22/2014 **COMPLETED** 5/19/2014 **SURF. ELEV.** 779.8 EQUIPMENT PS-150 METHOD Rotosonic CONTRACTOR Cascade Drilling ANGLE BEARING DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY BORING DEPTH 37.2 ft. GROUND WATER DEPTH: DURING COMP. 14.77 ft. DELAYED **NOTES** Top of Casing Elevation = 782.47 STRATA DESCRIPTION **WELL DATA** Œ GRAPHIC DEPTH Surface: protective aluminum cover with bollards; 4-foot square concrete pad ELEV. (DEPTH) FLEV Poorly-graded Sand with Silt (SP-SM) Surface Seal: concrete - dark brown, damp, loose, no plasticity, lower fine to upper fine grain, 777.8 cohesive; trace organics; trace gravel sized rock fragments; angular (2.0)to subangular grains 776.8 Silty Sand (SM) - rusty red, dry, medium dense, no plasticity, lower fine to upper fine grain, cohesive; slight increase in clay content; micaceous - SM: orangish brown to tan grading to light gray/white, dry, medium dense to loose, no plasticity, upper fine to lower medium with trace upper medium grain, saprolite, noncohesive; completely weathered to residual soil; trace gravel sized rock fragments; rock fragments range from brittle/friable to hard/more competent; micaceous; muscovite, chlorite, biotite, quartz, plagioclase identifiable Annular Fill: 90/10 Portland Cement/Bentonite Powder - SM: medium brown/orangish brown to medium gray with greenish gray mottling, damp, medium dense to loose, no plasticity, upper fine to upper medium grain, saprolite, noncohesive; completely weathered to residual soil; zones of remnant banding visible; brittle to hard rock fragments included; chlorite, biotite, muscovite, quartz, plagioclase identifiable: harder/more competent rock fragments tend to be felsic 다니 (quartz, plagioclase) and brittle/friable rock fragments tend to be mafic (biotite, chlorite) 759.0 T + T(20.8)- SM: white to light gray with zones of orangish brown to brown, damp, medium dense to loose, no plasticity, fine to upper medium grain, saprolite, noncohesive; completely weathered to residual soil; Annular Seal: 3/8 Hole Plug (medium bentonite chips) remnant banding visible in darker (more mafic) zones; gravel sized, angular rock fragments included; rock fragment size and strength 22 754.8 (hardness) increases with depth; micaceous (25.0)-Filter: 20/30 Silica Sand 752.9 (26.9)Well: 2" OD PVC (SCH 40) 30 - SM: white to light gray with zones of orangish brown to brown, -Screen: 10 ft; pre-pack damp, medium dense to loose, no plasticity, fine to upper medium grain, saprolite, noncohesive; completely weathered to residual soil; remnant banding visible in darker (more mafic) zones; gravel sized, angular rock fragments included; rock fragment size and strength (hardness) increases with depth; micaceous 742.9

Bottom of borehole at 37.2 feet.

=Sump:0.30 ft.

742.6



2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 6/10/14 17:36 - \\ALTRCFS02\X2DBSMEL\$\GINT\PLANT YATES HYDRO-GEOLOGICAL STUDY.GPJ

## LOG OF TEST BORING AND WELL INSTALLATION

**BORING YGWA-6I/PZ-6I** 

PAGE 1 OF 2 ECS37976

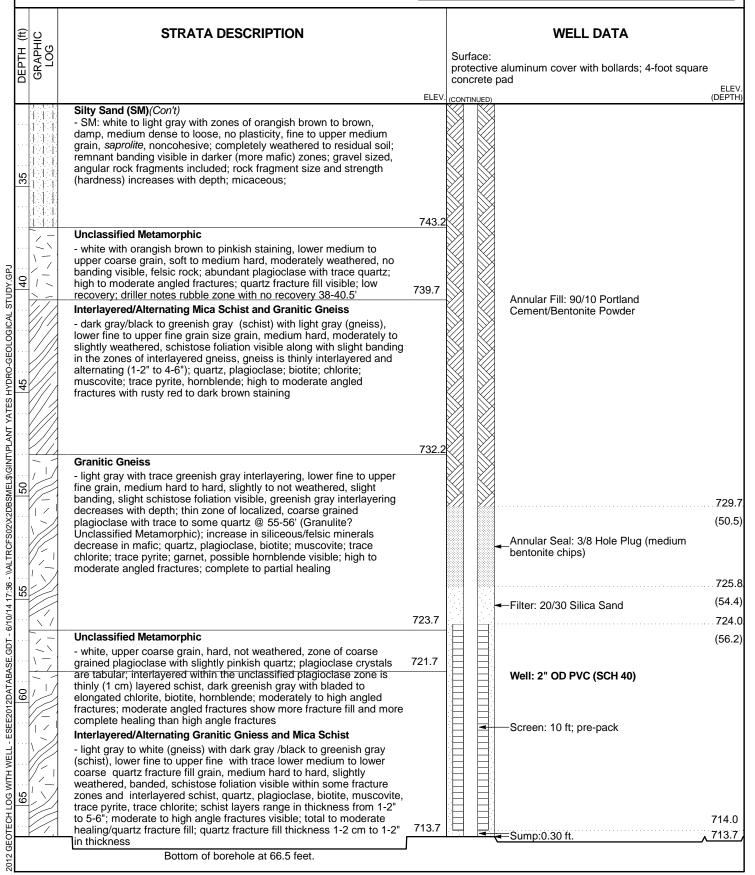
SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING  DATE STARTED 4/21/2014 COMPLETED 5/19/2014 SURF. ELEV. 780.2 COORDINATES: N:1,260,490  CONTRACTOR Cascade Drilling EQUIPMENT PS-150 METHOD Rotosonic  DRILLED BY D. Wilcox LOGGED BY B. Smelser CHECKED BY ANGLE  BORING DEPTH 66.5 ft. GROUND WATER DEPTH: DURING COMP. 14.9 ft. DELAYED  NOTES Top of Casing Elevation = 782.73	BEARING
DATE STARTED         4/21/2014         COMPLETED         5/19/2014         SURF. ELEV.         780.2         COORDINATES:         N:1,260,490           CONTRACTOR         Cascade Drilling         EQUIPMENT         PS-150         METHOD         Rotosonic           DRILLED BY         D. Wilcox         LOGGED BY         B. Smelser         CHECKED BY         ANGLE           BORING DEPTH         66.5 ft.         GROUND WATER DEPTH: DURING         COMP.         14.9 ft.         DELAYED	BEARING
CONTRACTOR         Cascade Drilling         EQUIPMENT         PS-150         METHOD         Rotosonic           DRILLED BY         D. Wilcox         LOGGED BY         B. Smelser         CHECKED BY         ANGLE           BORING DEPTH         66.5 ft.         GROUND WATER DEPTH: DURING         COMP.         14.9 ft.         DELAYED	BEARING
CONTRACTOR         Cascade Drilling         EQUIPMENT         PS-150         METHOD         Rotosonic           DRILLED BY         D. Wilcox         LOGGED BY         B. Smelser         CHECKED BY         ANGLE           BORING DEPTH         66.5 ft.         GROUND WATER DEPTH: DURING         COMP.         14.9 ft.         DELAYED	BEARING
DRILLED BY _D. WilcoxLOGGED BY _B. Smelser CHECKED BY ANGLE  BORING DEPTH _66.5 ft GROUND WATER DEPTH: DURING COMP14.9 ft DELAYED	
BORING DEPTH 66.5 ft. GROUND WATER DEPTH: DURING COMP. 14.9 ft. DELAYED	
E O STRATA DESCRIPTION WELL DATA	Λ.
	<b>n</b>
Surface: protective aluminum cover with bolls	ards; 4-foot square
Concrete pad	ELEV. (DEPTH)
Poorly-graded Sand with Silt (SP-SM)	(DEFIN)
- dark brown, damp, loose, no plasticity, lower fine to upper fine grain, cohesive; trace organics; trace gravel sized rock fragments; angular	778.2
to subangular grains 777.2	(2.0)
Silty Sand (SM)	, ,
- rusty red, dry, medium dense, no plasticity, lower fine to upper fine grain, cohesive; slight increase in clay content; micaceous	
- SM: orangish brown to tan grading to light gray/white, dry, medium dense to loose, no plasticity, upper fine to lower medium with trace	
upper medium grain, saprolite, noncohesive; completely weathered to	
residual soil; trace gravel sized rock fragments; rock fragments range from brittle/friable to hard/more competent; micaceous; muscovite,	
chlorite, biotite, quartz, plagioclase identifiable	
ம்	
gray mottling, damp, medium dense to loose, no plasticity, upper fine	
to residual soil; zones of remnant banding visible; brittle to hard rock fragments included; chlorite, biotite, muscovite, quartz, plagioclase	
identifiable; harder/more competent rock fragments tend to be felsic (quartz, plagioclase) and brittle/friable rock fragments tend to be	
mafic (biotite, chlorite)	
CM white to light account to be a second to the second to be a second to the second to	
- SM: white to light gray with zones of orangish brown to brown, damp, medium dense to loose, no plasticity, fine to upper medium	
grain, saprolite, noncohesive; completely weathered to residual soil; remnant banding visible in darker (more mafic) zones; gravel sized,	
(hardness) increases with depth; micaceous:	



BORING YGWA-6I/PZ-6I
PAGE 2 OF 2
ECS37976

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study





BORING PZ-6D PAGE 1 OF 4 ECS37976

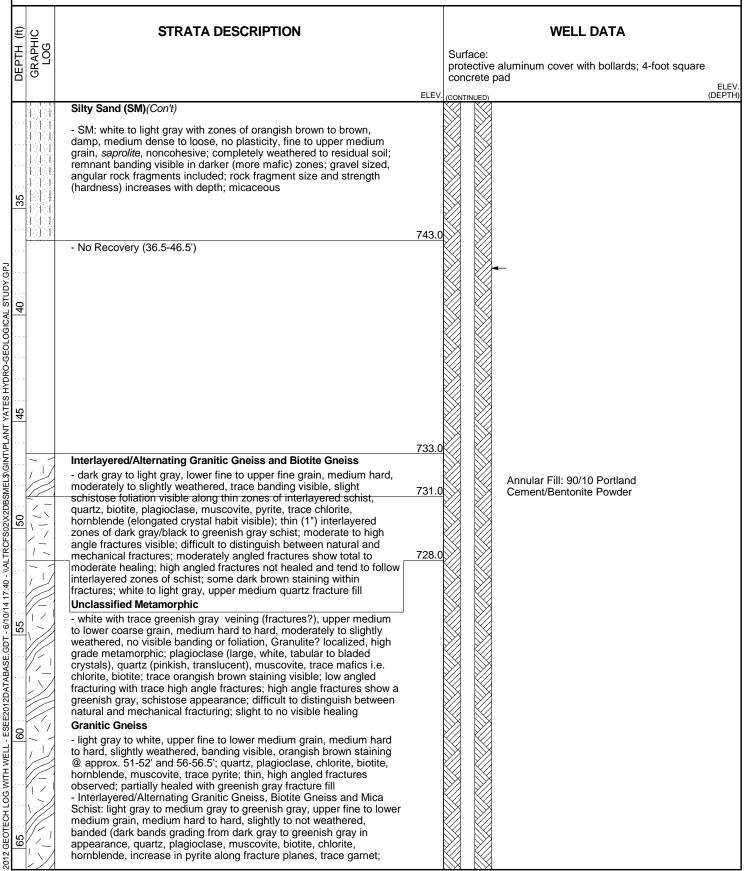
		B DEPTH 131.5 ft. GROUND WATER DEPTH: DURING  Top of Casing Elevation = 782.02	_ COMI		
DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION		WELL DATA  Surface: protective aluminum cover with bollards; 4-foot sconcrete pad	square
5 10 5		Poorly-graded Sand with Silt (SP-SM)  - dark brown, damp, loose, no plasticity, lower fine to upper fine grain, cohesive; trace organics; trace gravel sized rock fragments; angular to subangular grains  Silty Sand (SM)  - rusty red, dry, medium dense, no plasticity, lower fine to upper fine grain, cohesive; slight increase in clay content; micaceous  - SM: orangish brown to tan grading to light gray/white, dry, medium dense to loose, no plasticity, upper fine to lower medium with trace upper medium grain, saprolite, noncohesive; completely weathered to residual soil; trace gravel sized rock fragments; rock fragments range from brittle/friable to hard/more competent; micaceous; muscovite, chlorite, biotite, quartz, plagioclase identifiable  - SM: medium brown/orangish brown to medium gray with greenish gray mottling, damp, medium dense to loose, no plasticity, upper fine to upper medium grain, saprolite, noncohesive; completely weathered to residual soil; zones of remnant banding visible; brittle to hard rock fragments included; chlorite, biotite, muscovite, quartz, plagioclase identifiable; harder/more competent rock fragments tend to be felsic (quartz, plagioclase) and brittle/friable rock fragments tend to be mafic (biotite, chlorite)  - SM: white to light gray with zones of orangish brown to brown, damp, medium dense to loose, no plasticity, fine to upper medium grain, saprolite, noncohesive; completely weathered to residual soil; remnant banding visible in darker (more mafic) zones; gravel sized, angular rock fragments included; rock fragment size and strength (hardness) increases with depth; micaceous	776.5	Surface Seal: concrete	(C) 77



BORING PZ-6D PAGE 2 OF 4 ECS37976

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study





BORING PZ-6D PAGE 3 OF 4 ECS37976

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study

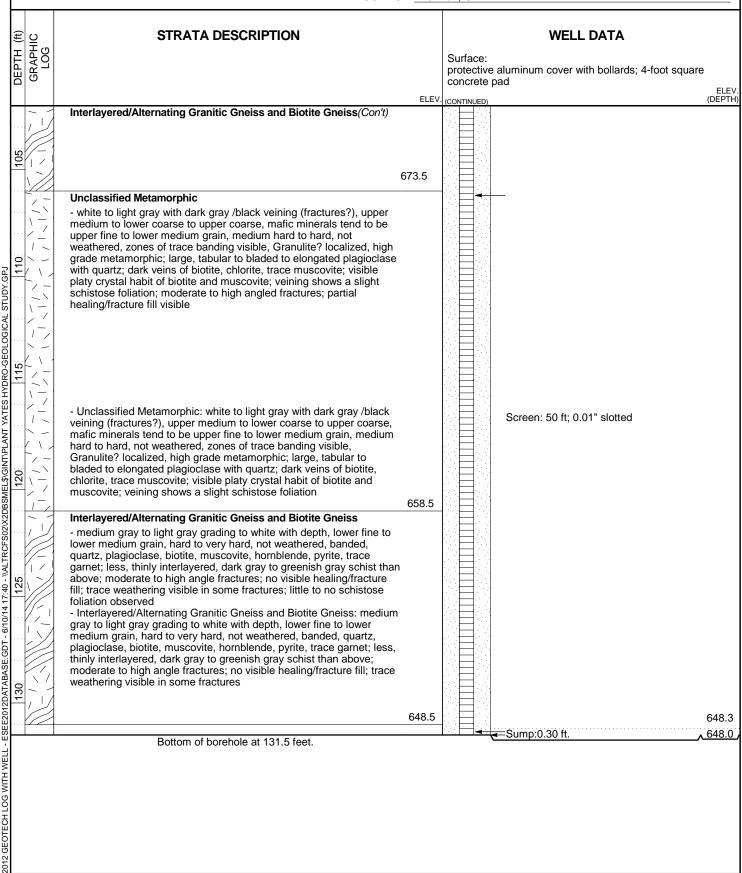
			Newi	lan,		_		_
€	GRAPHIC LOG	STRATA DESCRIPTION					WELL DATA	
DEPTH (ft)	RAP				rfac		e aluminum cover with bollards; 4-foot square	
占	Ö			cor	ncre	ete	pad	ELE\
		thin, high angled fractures observed; partially healed with greenish	ELEV.	(CON	ITINU	ED)	(1	(DEPT
20		gray fracture fill; interlayered, greenish gray schist averages 1-2 mm thick throughout the unit  Granitic Gneiss(Con't)  - Interlayered/Alternating Granitic Gneiss, Biotite Gneiss and Mica Schist: light gray to medium gray to greenish gray, upper fine to upper medium grain, medium hard to hard, not weathered, banded (dark bands grading from dark gray to greenish gray in appearance, quartz, plagioclase, muscovite, biotite, chlorite, hornblende, increase in pyrite along fracture planes, trace garnet; thin, high angled fractures observed; partially healed with greenish gray fracture fill; interlayered, greenish gray schist averages 1-2 mm thick					Annular Fill: 90/10 Portland Cement/Bentonite Powder	
				W		X		705.9 (73.9)
. 2/	-`/		704.5					(13.
	11111	Unclassified Metamorphic  - white to light gray with dark gray /black veining (fractures?), upper medium to lower coarse to upper coarse, mafic minerals tend to be upper fine to lower medium grain, medium hard to hard, slightly to not weathered, zones of trace banding visible, Granulite? localized, high	-				Annular Seal: 3/8 Hole Plug (medium bentonite chips)	
	-	grade metamorphic; large, tabular to bladed to elongated plagioclase _	700.5					701
200		with quartz; dark veins of biotite, chlorite, trace muscovite; visible platy crystal habit of biotite and muscovite; veining shows a slight schistose foliation	00.5				≺−Filter: 20/30 Silica Sand	(78
		Interlayered/Alternating Granitic Gneiss and Biotite Gneiss						
82		<ul> <li>medium gray to light gray grading to white with depth, lower fine to lower medium grain, hard to very hard, not weathered, trace banding with some zones having a schistose foliation, quartz, plagioclase, biotite, muscovite, hornblende, pyrite, trace garnet; pyrite abundant in fractures; thinly (1-2 cm to 1-2") interlayered, dark gray to greenish gray schist; moderate to high angle fractures; trace weathering visible in some fractures</li> </ul>						698 (81.
06		- Interlayered/Alternating Granitic Gneiss and Biotite Gneiss: medium gray to light gray grading to white with depth, lower fine to lower medium grain, hard to very hard, not weathered, trace banding with some zones having a schistose foliation, quartz, plagioclase, biotite, muscovite, hornblende, pyrite, trace garnet; pyrite abundant in fractures; thinly (1-2 cm to 1-2") interlayered, dark gray to greenish gray schist; moderate to high angle fractures; trace weathering visible in some fractures						
							Screen: 50 ft; 0.01" slotted	
95							Well: 2" OD PVC (SCH 40)	
100		- Interlayered/Alternating Granitic Gneiss and Biotite Gneiss: medium gray to light gray grading to white with depth, lower fine to lower medium grain, hard to very hard, not weathered, trace banding with some zones having a schistose foliation, quartz, plagioclase, biotite, muscovite, hornblende, pyrite, trace garnet; pyrite abundant in fractures; thinly (1-2 cm to 1-2") interlayered, dark gray to greenish gray schist; moderate to high angle fractures; trace weathering visible in some fractures						



BORING PZ-6D PAGE 4 OF 4 ECS37976

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Yates Hydro-Geological Study



<u>Θ</u> ΔΕ	CADI	Some	& Consultancy and and					Bori	ing No.: PZ-24IA		
				natruation	امما						
DOI II	Name:	J/VV Plant	Vates	onstruction	Log		Date Started: 06/02/2020	Logger: Clei	Sheet: 1 of ment Papafio	3	
Project I						— Da	ate Completed: 06/03/2020	• • •	•		
1 -			nan, GA				-		THE VY IIII OF G		
			1	T					1		
Depth (feet)	Sample Interval (	Blow Counts	Recovery (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Construction Details	W	ell
										1	
0											
							(0.0-19.0') No recovery. Hydrovac to borehole clearance.	19.0 ft bgs for	Surface		
' -	1						borenoie clearance.		completion		
_ 2 _	1								consists of a locking		
3									monument above 2.85'		
_ 4 _	1								ground		
F 5 -									surface with a weep hole,		
F	]								vent hole in		
	1								well casing,		
<del></del>									pea gravel between well		
8	1								monument and well		
_ 9 _									casing,		
L _	]								4'x4'x4" concrete pad,		
10	1								and four		
11									concrete bollards.		
12_	1								bollards.		
13	1								Portland		
L _	1								Cement with		
14	1								6% Bentonite. 2 inch		
15									diameter		
16	1								Schedule 40 PVC riser.		
17	1								I VOIISCI.		
18	]										
`L _	1										
19	+						(19.0-29.0') Silty sand (SM); mottled	very pale brown	$\dashv$		
20	<del>]</del> /\						(10YR7/4) and white (10YR 8/1); fine	grained to			
를21	1 / \						medium grained sand; very loose; so oxidation present; low recovery; sapr	ome mica; iron olitic.			
- 22	1/ //			2010年			<b>,</b> , , , , , , , , , , , , , , , , , ,				
3 <u> </u>	1/ \			ST.							
23	<u> </u>										
24	{ }										
25	1\ /										
	]\ /			N. C. C.							
<u> </u>	1 \ /			No the latest of							
28	\			ALC: SEL							
29	<u> 1 V L</u>										
Drilling (	Co.:		ade Drilli	ng			Sampling Method:Core B				
Driller:											
	Method:							•			
Drilling F		Wate					Water Level Finish (ft. bto				
Remark				= inch; bgs = below	ground	surface;		<u>Yes</u>	☐ No		
NA = not	applicable	e / avai	iable.				Surface Elev.: 761.80				
5							North Coor: 1258910.7				
ž [							East Coor: 2073930.0	/			

Project	Location	: <u>Newn</u>	an, GA	1		_	Weather Con	Editor: <u>Grant</u>		1	
Depth (feet)	Sample Interval		Recovery (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Construction Details	W	/ell
30							(29.0-39.0') Silty sand (SM); grayish bro 5/2); fine grained to medium grained sa oxidation present.  (33.0-34.0') Color change to mottled ver (10YR 7/4) and white (10YR 8/1). (34.0-39.0') Color change to very pale be 8/2); loose; dry; saprolitic.  (39.0-44.0') Clayey silty sand (SM-SC); brown (10YR 6/4); fine grained to medius sand; trace clay; loose; slight plasticity; moist.  (44.0-48.0) Silty sand (SM); pale brown fine grained to medium grained sand; weathered quartz (49.0-52.0') Poorly graded sand (SP); with (10YR 8/3); fine grained to medium grained some silt; loose; dry.  (52.0-54.0') Silty sand (SM); mottled light (7.5YR 6/3) and light olive gray (5Y 6/2) to medium grained sand; mica present; (54.0-59.0') Well graded sand (SW); mothown (2.5YR 6/4) and white (10YR 8/1) to coarse grained sand; loose to medium residual rock gravel; possible transition weathered bedrock (PWR); dry.  (59.0-71.0') Granitic gneiss; light gray (5 feldspar, quartz, mica mineralogy; highl moderately weathered; intensely fractur horizontal fractures; stainir surface medium foliation; joints and fractures medium; low recovery; very poor RQI	light yellowish am grained mica present;  (10YR 6/3); pose; moist.  e grained to vein; moist. ery pale brown ined sand;  ottled reddish of the grained wet.  ottled reddish of the grained in dense; to partially	Portland Cement with 6% Bentonite. 2 inch — diameter Schedule 40 PVC riser.		

ARCADIS   Design & Constitution   Design & Constitutio								Boring No.: PZ-24IA			
Borir	na La	a/W	ell Co	nstruction	Loa				Sheet: 3 of	2	
Project	Name:	Plant	Yates		5		Date Started: <u>06/02/2020</u>	_Logger: <u>Cle</u> r	ment Papafio		
Project							ate Completed: <u>06/03/2020</u>				
Project	Locatior	n: <u>Newr</u>	nan, GA				Weather C	onditions: <u>-</u>			
Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Photo Log	PID (ppm)	Graphic Log	Description		Construction Details	Well	
63							(59.0-71.0') Granitic gneiss; light gray feldspar, quartz, mica mineralogy; hig moderately weathered; intensely fract horizontal to horizontal fractures; stai surface medium foliation; joints and f to foliation; low recovery; very poor R (71.0-82.5') Granitic gneiss; gray (7.5 feldspar, quartz, mica mineralogy; thi foliation moderately weathered; mode	ghly to tured; sub ning on fracture ractures parallel QD.	Portland Cement with 6% Bentonite. 2 inch — diameter Schedule 40 PVC riser.		
73 74 75							staining on fracturé surface.	·	Bentonite _ seal.		
76 77 78 79							(75.0-82.5') Near horizontal fractures foliated; slightly weathered to fresh; h color change to white (7.5YR 8/1).		Filter pack: #1A (12-40) sand		
80							(82.5-87.0') Granitic gneiss; light gray feldspar, quartz, mica mineralogy; int moderately fractured; near horizontal fractures; very slightly weathered to f moderatly hard; very poor RQD.	ensely to to sub horizontal	2 inch diameter Sch. 40 PVC U-Pack dual wall 0.010-inch slotted screen.		
88	s:						End of boring 87.0 ft bgs.				
501 51											
BOKIN BOKIN											
MPG											

PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 47.10 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE PZ-35

DRILL RIG: Sonic PS-150
DATE STARTED: 7/13/16
DATE COMPLETED: 7/20/16

ROREHOLE PZ-35

NORTHING: 1,258,5
EASTING: 2,073,806
GS EL EVATION: 7/4

NORTHING: 1,258,593.16 EASTING: 2,073,805.60 GS ELEVATION: 740.9 TOC ELEVATION: 743.81

SHEET 1 of 1 DEPTH W.L.: 9.99 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/20/16 TIME W.L.: N/A

		SOIL BROEILE ft			100			N: 74	3.81	
_	N C	SOIL PROFILE TT					AMPLE	<u>-</u> S		
OEPTH (#)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	DEPTH	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 -	— 740 —	0.00 - 10.00 No recovery; Hydrovac			(ft)	Ø				WELL CASING Interval: 0.0'-36.0' Material: Schedule 40 PV
5	- - - 735								Portland _ Type 1	Diameter: 2" Joint Type: Threaded  WELL SCREEN Interval: 36.0'-46.0' Material: U-Pack Schedu PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 P'
10 —	- - 	10.00 - 11.00	CM		730.90				= - = - = -	FILTER PACK Interval: 34.0'-46.0' Type: #1 Type Sand
-	— 730 - -	silty SAND, ash in core sample possibly recovered from hydrovac zone above 11.00 - 14.00 CLAY, dark reddish browm, cohesive, moist	CH		10,007 29.90 11.00	1		7.00 7.00	=	FILTER PACK SEAL Interval: 31.0'-34.0' Type: Bentonite Pellets a Chips ANNULUS SEAL
15 —	- - 725	14.00 - 17.00 SAND, fine sand, mottled brown and grey, moist, loose	SP		726.90 14.00 723.90	'		7.00	Portland	Interval: 0.0'-31.0' Type: Portlant Type 1 WELL COMPLETION Pad: 4'x4'x4"
-	-   -	17.00 - 27.00 fine sand, mottled brown and grey, relict laminations, moist, loose			17.00					Protective Casing: Alumi  DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
20	- 720 - - -					2		10.00 10.00		
25	- 715 	27.00 - 30.00			713.90 27.00					
30 -	_ _ _ 710 _ _	silty SAND, dull grey to brown, moist, loose  30.00 - 32.00 mottled brown to tan, lamination, dry to moist, loose  32.00 - 37.00 mottled brown to tan, lamination, micaceous, dry to moist, loose	SM		710.90 30.00 708.90 32.00	. 3		<u>5.00</u> 10.00	Bentonite Pellets and — Chips	
35 —	- 705 - -	37.00 - 42.00 grey, dry, loose			703.90				0.010"	
40	- 700 	42.00 - 47.00 transitionally weathered rock - biotite/muscovite GNEISS,		D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	698.90 42.00	· 4		<u>4.00</u> 10.00	#1 Type	
45 —	- - - 695	weathered, friable	PWR	0 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	693.90				Sump –	
50 —	- - -	Boring completed at 47.10 ft			47.00				- - -	
DRII		LE: 1 in = 6.5 ft COMPANY: Cascade Drilling		CHEC	SPECTO SPECTO SED BY 9/29/1	/: Ra			es nan, PG	Golder



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 47.00 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE PZ-37

DRILL RIG: Sonic PS-150
DATE STARTED: 6/29/16
DATE COMPLETED: 7/6/16

REASTING: 2,074,699
GS EL EVATION: 75

NORTHING: 1,256,471.14 EASTING: 2,074,699.59 GS ELEVATION: 758.0 TOC ELEVATION: 760.78

SHEET 1 of 1 DEPTH W.L.: 6.0 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/6/2016 TIME W.L.: 07:40

	Т	SOIL PROFILE ft				TOC			N: 76	0.78 T	
_	NO	SOIL PROFILE II			_			AMPLE	S		
OEP IH	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC	F00	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 -	- -	0.00 - 3.00 silty CLAY, red to brown, micaceous	CL-MI	L		755.00				-	WELL CASING Interval: 0.0'-36' Material: Schedule 40 PV Diameter: 2 Joint Type: Threaded
5	755 - -	3.00 - 5.00 silty SAND, trace gravel, pale grey to green, plagioclase nodules (saprolite) 5.00 - 7.00	SM			3.00 753.00 5.00	1		7.00 7.00		WELL SCREEN Interval: 36.5-46.5' Material: U-Pack Schedu PVC
-	- 750	trace clay, white and orange nodules, plagioclase, dry (saprolite)  7.00 - 9.50				751.00 7.00					Diameter: 2 Slot Size: 0.010" Slotted Screen
-	750 	trace gravel, white to dark brown, muscovite  9.50 - 17.00				749.00 9.50					End Cap: Schedule 40 P  FILTER PACK Interval: 33.0'-47.0'
10 -	- -	trace clay, pale yellow brown, plagioclase nodules, dry (saprolite)				3.30	2		10.00 10.00	Portland	Type: #1 Type Sand  FILTER PACK SEAL Interval: 25.0'-33.0' Type: Bentonite Pellets a
15	745 - -									Type 1	Chips  ANNULUS SEAL Interval: 0.0'-25.0' Type: Portland Type 1
=	- - 740	17.00 - 27.00 pale yellow brown to brown, white and brown nodules, saprolitic				741.00 17.00					WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Alumi
20 —	- - -	gneiss, dry									DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
- - - -	- 735						3		10.00 10.00		
25 —	- - -										
30 —	- 730 - -	27.00 - 37.00 transitionally weathered rock- feldspathic GNEISS, muscovite, biotite, feldspar, quartz, foliated and layered, dark green, amphiboile lense			DDDDD D	731.00 27.00				Bentonite Pellets and — Chips	
	- - 725 -		PWR	7444 0 0 444 0 0 0 0 0	07 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		4		10.00 10.00		
35 —	- - -			V 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	V V V V V V V V V V V V V V V V V V V	721.00					
40 —	720 	37.00 - 43.00 bedrock - feldspathic GNEISS, biotite, muscovite, quartz, plagioclase, grey to white, more feldspar and quartz, oxidized and fractured	GNEIS			37.00					
· · ·	- - 715					715.00	5		8.00 10.00	0.010" Slotted – Screen	
45 —	- -	43.00 - 47.00 more granitic, lots of feldspar and quartz				43.00				#1 Type	
- - - -	- 710	Boring completed at 47.00 ft			<b></b>	711.00				Sump -	
50 —	-									-	
DRII	LLING	LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Tom Ardito		CHE	CK	PECT( ED BY 9/29/1	: Ra			rds nan, PG	Golder



PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 56.10 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE

DRILL RIG: Sonic PS-150

DATE STARTED: 7/11/16

DATE COMPLETED: 7/12/16

PAGE 15/16

DATE COMPLETED: 7/12/16

DATE COMPLETED: 7/12/16

PAGE 15/16/16

CS E1 EVALUABLE 777.2 GS ELEVATION: 777.2 TOC ELEVATION: 779.83 ft

SHEET 1 of 2

DEPTH W.L.: 17.71 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/13/2016 TIME W.L.: 15:25

		SOIL PROFILE			100		AMPLE		9.83 ft	
_	NO N	SOIL FROM ILL						-3	MONITORING	
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0 —	_	0.00 - 10.00 No recovery; hydrovac							0000 0000 0000 0000 0000 0000 0000 0000	WELL CASING
_	- 775	No recovery, riyurovac								Interval: 0.0'-45.8' Material: Schedule 40 PVC Diameter: 2"
_	- ''								0000 0000 0000 0000 0000 0000 0000 0000 0000	Joint Type: Threaded
- 5 —	- -								301 - 301 -	WELL SCREEN Interval: 45.8'-55.8' Material: U-Pack Schedule 40 PVC
-	_ 770								Portland _	Diameter: 2" Slot Size: 0.010' End Cap: Schedule 40 PVC
_	_				767.20					FILTER PACK Interval: 43.1'-56.1' Type: #1 Type Sand
10 — –	-	10.00 - 12.00 clayey SAND, coarse sand, dark red, cohesive	sc		10.00					FILTER PACK SEAL Interval: 38.5'-43.1'
-	— 765	12.00 - 14.00 sandy SILT to silty SAND, pinkish orange	SP-ML	////	765.20 12.00	1		6.00		Type: Bentonite Pellets and Chips
_		14.00 - 16.00			763.20 14.00	·		6.00		ANNULUS SEAL Interval: 0.0'38.5' Type: Portland Type 1
15 <del>-</del>	-  -  -	sandy SILT, reddish brown, moist loose  16.00 - 22.00	ML		761.20 16.00					WELL COMPLETION Pad: 4'x4'x4"
-	<del>- 760</del>	sandy SILT to silty SAND, dark reddish brown, trace gravel, dry, loose								Protective Casing: Aluminum  DRILLING METHODS
_	-		SP-ML						Portland -	Soil Drill: 4" Sonic Rock Drill: 4" Sonic
20 —	_							10.00	Type 1	
_	- 755	22.00 - 26.00			755.20 22.00	2		10.00	0000 0000 0000 0000 0000 0000 0000 0000 0000	
_	-	silty SAND, mottled white and grey, high plagioclase content			22.00					
25 —	-		SM						0000 0000 0000 0000 0000 0000 0000 0000 0000	
_	-	26.00 - 32.00			751.20 26.00				9000 9000 9000 9000 9000 9000 9000 900	-
-	<del> 750</del>	poorly sorted, greyish brown, dry, loose								
_									500 1000 1000 1000 1000 1000 1000 1000	-
30 —	-							10.00	Done horse	-
_	- 745	32.00 - 36.00		D 1	745.12 32.00	3		10.00		
_	-	transitionally weathered rock, pegmatite GRANITE, highly weathered, large plagioclase and quartz crytals		A D D D D D D D D D D D D D D D D D D D	32.00				22001 22001	-
35 —	-		PWR						Food Food Food Food Food Food Food Food	
_	-	36.00 - 46.00		<b>₽</b> ₽₽₽	741.20 36.00					-
-	<del> 740</del>	biotite GNEISS, some staining near top of core, pyrite inclusions							Bentonite Pellets and — Chips	
_	-								-	-
40 —	-		01/5/00					10.00	Bentonite	-
_	- 735		GNEISS			4		10.00 10.00		1
_	-								-	_
- 45 —	-									
_	-	46.00 - 49.00			731.20 46.00			$\vdash \vdash$	0.010"	-
-	<del>- 730</del>	biotite GNEISS				_		10.00	Slotted – Screen	-
-	]									
-	-				728.20 49.00	5		10.00		

LOG SCALE: 1 in = 6.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Dale

GA INSPECTOR: Ben Hodges CHECKED BY: Rachel Kirkman, PG



# PROJECT: SCS Plant Yates PROJECT NUMBER: 1660300 DRILLED DEPTH: 56.10 ft LOCATION: Newnan, GA

RECORD OF BOREHOLE

DRILL RIG: Sonic PS-150

DATE STARTED: 7/11/16

DATE COMPLETED: 7/12/16

PAGE 15/16

DATE COMPLETED: 7/12/16

DATE COMPLETED: 7/12/16

PAGE 15/16/16

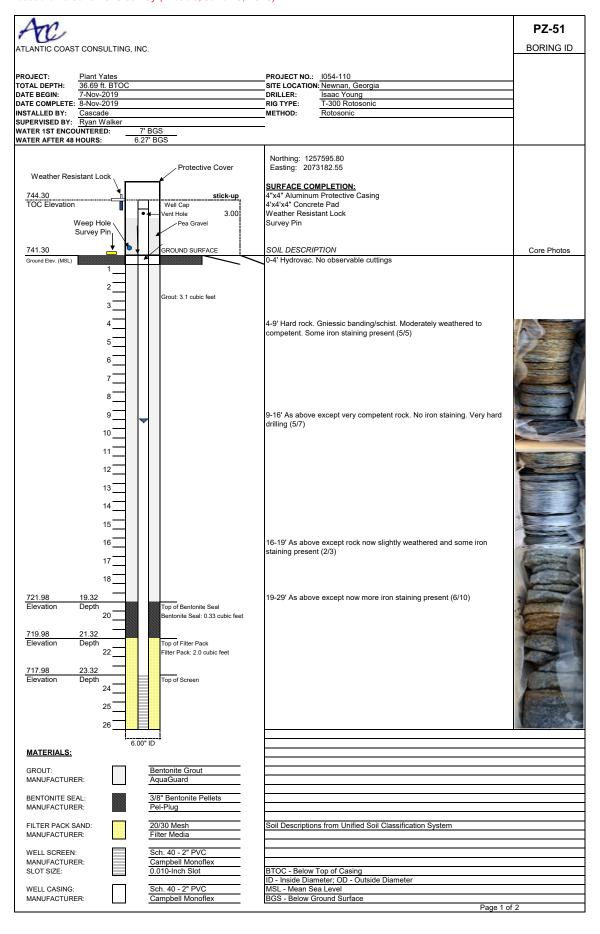
CS EL EVALUABLE 777.2

GS ELEVATION: 777.2 TOC ELEVATION: 779.83 ft SHEET 2 of 2

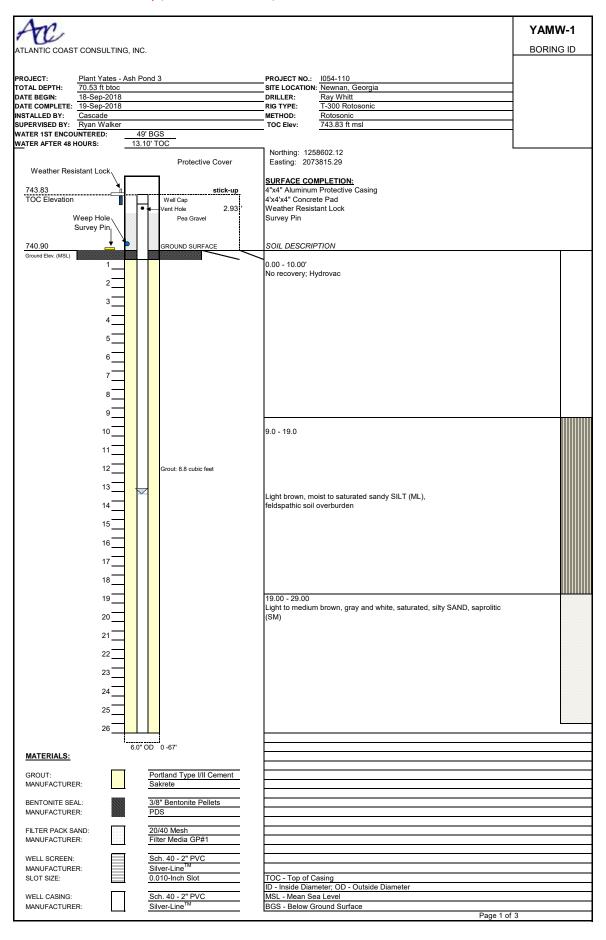
DEPTH W.L.: 17.71 ft (bgs) ELEVATION W.L.: (amsl) DATE W.L.: 7/13/2016 TIME W.L.: 15:25

		SOIL PROFILE					AMPLE		3.00 11	
DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	nscs	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
50 — - - -	- - 725 -	49.00 - 52.00 biotite GNEISS, migmatic gneiss bands with iron staining (Continued) 52.00 - 56.00 biotite GNEISS			725.20 52.00	5		10.00 10.00	#1 Type	WELL CASING Interval: 0.0'-45.8' Material: Schedule 40 PVC Diameter: 2" Joint Type: Threaded
55 —	- - -	Boring completed at 56.10 ft			721.20 56.00				Sump –	WELL SCREEN Interval: 45.8'-55.8' Material: U-Pack Schedule 4 PVC Diameter: 2"
_	— 720 –								- -	Slot Size: 0.010' End Cap: Schedule 40 PVC FILTER PACK Interval: 43.1'-56.1'
60 —	- - -								_ _ -	Type: #1 Type Sand  FILTER PACK SEAL Interval: 38.5'-43.1'
- -	— 715 –								- - -	Type: Bentonite Pellets and Chips ANNULUS SEAL Interval: 0.0'38.5'
65 — –	  -  -								_ -	Type: Portland Type 1  WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Aluminui
- - -	710  								- - -	DRILLING METHODS Soil Drill: 4" Sonic Rock Drill: 4" Sonic
70 —	- - -								<u>-</u> - -	
<u>-</u>	— 705 - -								- -	
75 — — —	- - 700								_ - -	
80 —	-								- - -	
-	- - - 695								-	
85 —	- - -								- -	
-, -,	- 690 								- - -	
90 <del>-</del>	-								_ _ _	
-	685 								- -	
95 — -	-   -   -								- - -	
90 — 95 — 100 — LOG DRIII	680  								- - -	
100 —									_	
DRII		LE: 1 in = 6.5 ft COMPANY: Cascade Drilling Dale	(	CHEC	SPECTO KED BY 9/29/1	: Ra			es nan, PG	Golder



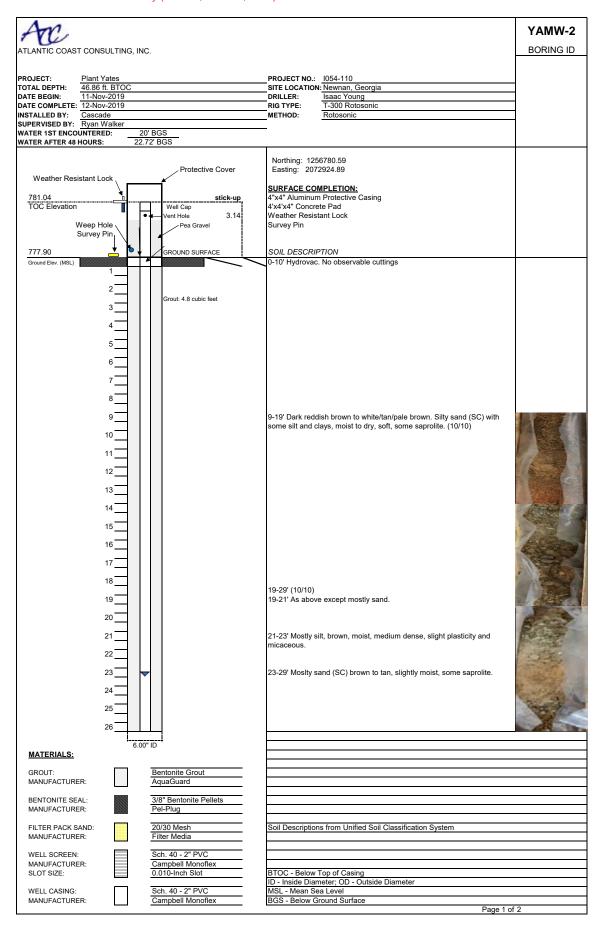


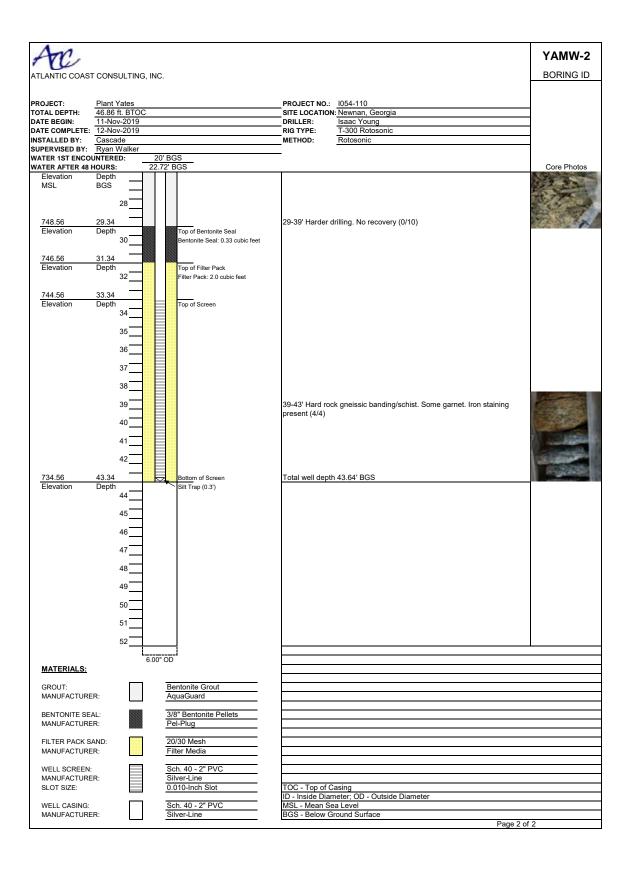
Arc				PZ-51
ATLANTIC COAS	T CONSULTING,	INC.		BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 36.69 ft. BTOC		PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	
DATE BEGIN:	7-Nov-2019		DRILLER: Isaac Young	
DATE COMPLETE	8-Nov-2019 Cascade		RIG TYPE:         T-300 Rotosonic           METHOD:         Rotosonic	
INSTALLED BY: SUPERVISED BY:			METHOD: ROTOSOFIIC	
WATER 1ST ENCO WATER AFTER 48		7' BGS 6.27' BGS		Core Photos
Elevation MSL	Depth BGS 28 29 30 30		29-33' As above except rock now very competent. No iron staining present. Very hard drilling (4/4)	
707.98	31 32 33.32	Bottom of Screen	Total well depth 33.62' BGS	
Elevation	Depth 34 35 36 35 36 37 38 39 40 41 42 43 45 46 47 48 49 50 51 52 52	Silt Trap (0.3')		
MATERIALS:	6.	00" OD		
GROUT: MANUFACTUR	ER:	Bentonite Grout AquaGuard		
BENTONITE SE MANUFACTUR		3/8" Bentonite Pellets Pel-Plug		
FILTER PACK S MANUFACTUR		20/30 Mesh Filter Media		
WELL SCREEN MANUFACTUR SLOT SIZE: WELL CASING:	ER:	Sch. 40 - 2" PVC Silver-Line 0.010-Inch Slot Sch. 40 - 2" PVC	TOC - Top of Casing ID - Inside Diameter; OD - Outside Diameter MSL - Mean Sea Level	
MANUFACTUR		Silver-Line	BGS - Below Ground Surface Page 2 of 2	2

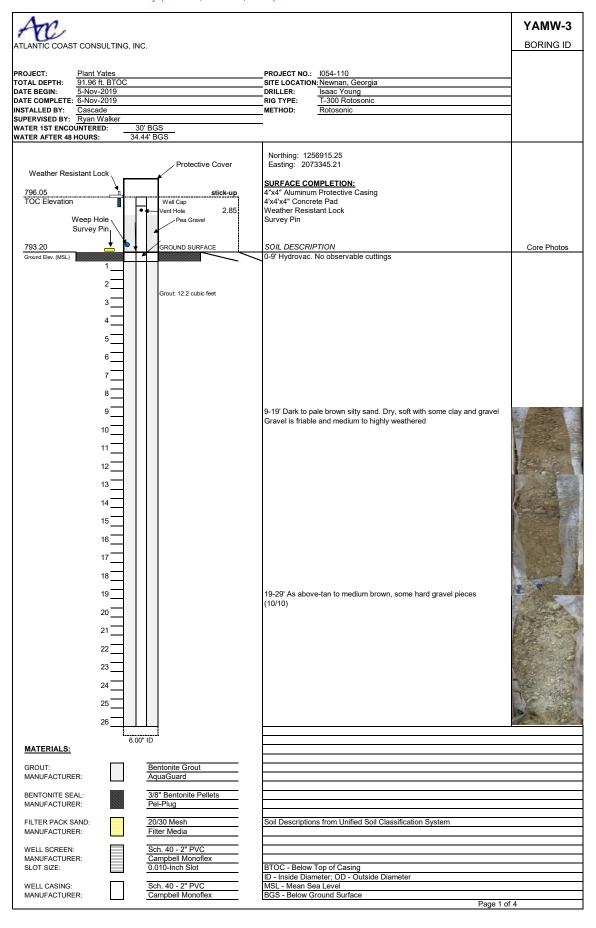


ACC ATLANTIC COAS	CONSULTING	, INC.				YAMW-1 BORING IE	
WATER 1ST ENCO		49' Bo	GS_	PROJECT NO.: SITE LOCATION: DRILLER: RIG TYPE: METHOD: TOC Elev:	I054-110 Newnan, Georgia Ray Whitt T-300 Rotosonic Rotosonic 743.83 ft msl		
WATER AFTER 48 I Elevation MSL	10uss:  Depth BGS 28 30 30 31 32 33 34 34 35 35 3	13.10'	TOC	(SM) 19.0 -29.0 29.0 - 39.0 Red	n brown, gray and white, saturated, silty SAND, saprolitic covery (10/10) white and gray, dry silty SAND, micacous and saprolitic		
	36 37 38 39 40 41 42 43 44 44			39.0 - 44.0 Rec Medium brown, (SM)	overy (5/5) white and gray, dry silty SAND, micacous and saprolitic		
	45			friable, iron stai	rown, Biotite/muscovite gneiss,weathered, ning at 54' (easily fractured) overy (5/10)		
MATERIALS:	51 52	6.0" OD	0 -67'	Gray, white bro	wn Gneiss, iron staining		
GROUT: MANUFACTURE	R:	S	ortland Type I/II Cement akrete				
BENTONITE SEA MANUFACTURE FILTER PACK SA MANUFACTURE	R:	P 20	/8" Bentonite Pellets DS  0/40 Mesh ilter Media GP#1				
WELL SCREEN: MANUFACTURE SLOT SIZE:		Si	ch. 40 - 2" PVC ilver-Line <sup>TM</sup> 010-Inch Slot	TOC - Top of C	asing neter; OD - Outside Diameter		
WELL CASING: MANUFACTURE	R:		ch. 40 - 2" PVC ilver-Line <sup>TM</sup>	MSL - Mean Se BGS - Below G	a Level	3	

ACC					YAMW-1
ATLANTIC COAS	T CONSULTING	, INC.			BORING ID
PROJECT:	Plant Yates - A	sh Pond	3	PROJECT NO.: 1054-110	
TOTAL DEPTH: DATE BEGIN:	70.53 ft. TOC 18-Sep-2018			SITE LOCATION: Newnan, Georgia  DRILLER: Ray Whitt	<del> </del>
DATE COMPLETE:	19-Sep-2018 Cascade			RIG TYPE:         T-300 Rotosonic           METHOD:         Rotosonic	
NSTALLED BY: SUPERVISED BY:	Ryan Walker			METHOD:   Rotosonic	
WATER 1ST ENCO		49' B			
Elevation	Depth	13.10'	100		
MSL	BGS				
687.9 Elevation	53.0 Depth		Top of Seal	49.0 - 59.0 Recovery (5/10)	
	· =		Bentonite Seal: 0.3 cubic feet	, (,	
685.9	55.0			Gray, white brown Gneiss, iron staining, highly fractured	
Elevation	Depth	attite atti	Top of Filter Pack	,,g,g,	
683.9	57.0				
Elevation	Depth		Top of Screen (56.67')		
	59		Filter Pack: 2.0 cubit feet		
	60			59.0 - 62.0 Recovery (2.1/3.0)	
	61			Gray, white brown Gneiss, iron staining, highly fractured	
				Gray, write brown Grielss, from starring, highly fractured	
	62				
	63				
673.9	67.0		Bottom of Screen (66.67')	62.0 - 70.0 Recovery (7.2/8.0) Hard rock. Visibly harder drilling. Biotite/muscovite gneiss, non-friable.	
Elevation	Depth		Silt Trap (4.0")		
				Gray, white brown Gneiss, iron staining, highly fractured	
	_				
				Boring terminated at 70.0' BGS	
	-				
	_				
	_				
	_				
	-				
	7		_		
	i.	6.0" OD	. <u></u> 0 -67'		
MATERIALS:					
GROUT: MANUFACTURE	ER:		ortland Type I/II Cement akrete		
BENTONITE SE MANUFACTURE			8" Bentonite Pellets DS		
FILTER PACK S			0/40 Mesh Iter Media GP#1		
WELL SCREEN	: =	S	ch. 40 - 2" PVC		
MANUFACTURE		Si	lver-Line <sup>TM</sup>		
SLOT SIZE:		0.	010-Inch Slot	TOC - Top of Casing ID - Inside Diameter; OD - Outside Diameter	
WELL CASING:			ch. 40 - 2" PVC	MSL - Mean Sea Level	
MANUFACTURE	ER:	Si	ilver-Line <sup>TM</sup>	BGS - Below Ground Surface Page 3 of	3



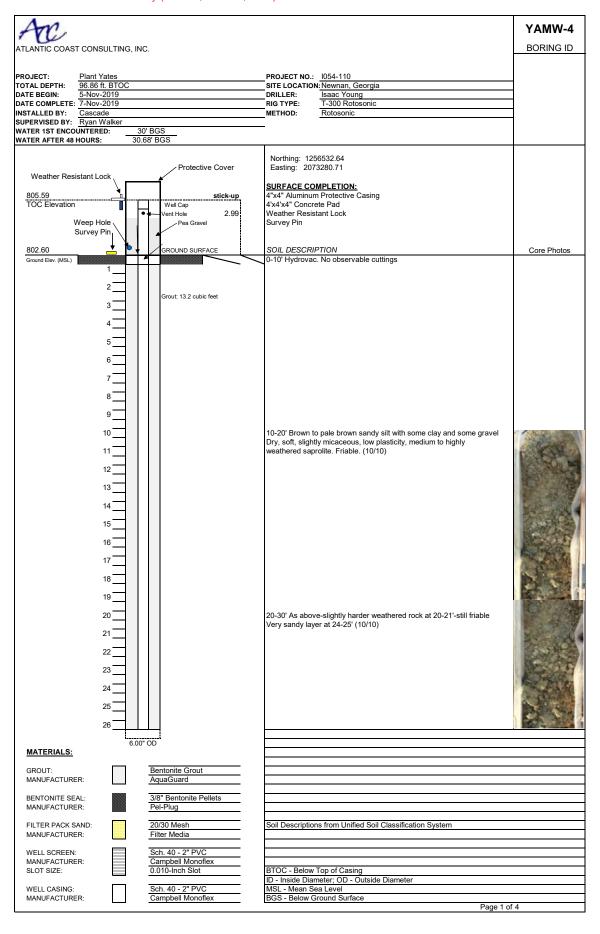




An					YAMW-3
ATLANTIC COAS	T CONSULTING,	INC.			BORING ID
DDG IFOT	Diam't Vatas			PD0 IF07 NO. 1054 440	
PROJECT: TOTAL DEPTH:	Plant Yates 91.96 ft. BTOC			PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	
DATE BEGIN:	5-Nov-2019			DRILLER: Isaac Young	
DATE COMPLETE:				RIG TYPE: T-300 Rotosonic	
INSTALLED BY: SUPERVISED BY:	Cascade Ryan Walker			METHOD: Rotosonic	
WATER 1ST ENCO		30' B0	GS	_	
WATER AFTER 48		34.44' I	BGS		Core Photos
Elevation MSL	Depth BGS 28			29-39' Hard rock-metamorphic gneiss banding/schist, fractured core	
	30 31 32 33 34 35 36 36			iron staining (4.5/10)	
	37 38 39 40 41 42 43 44 45 45			39-49' As above (4.5/10)	
	46 47 48 49 50 51 52 52			49-59' As above-less fractured rock (8/10)	
MATERIALS:	6.	00" OD			
	F1	_	ontonito Cra:-t		
GROUT: MANUFACTURE	ER:		entonite Grout quaGuard		
2.0		710	,		
BENTONITE SE MANUFACTURI			8" Bentonite Pellets el-Plug		
FILTER PACK S MANUFACTURE		Fi	0/30 Mesh Iter Media		
WELL SCREEN			ch. 40 - 2" PVC		
MANUFACTURE	ER:		O10 Inch Slot	TOC. Top of Cosing	
SLOT SIZE:		0.	010-Inch Slot	TOC - Top of Casing ID - Inside Diameter; OD - Outside Diameter	
WELL CASING:			ch. 40 - 2" PVC	MSL - Mean Sea Level	
MANUFACTURE			lver-Line	BGS - Below Ground Surface Page 2 of	4

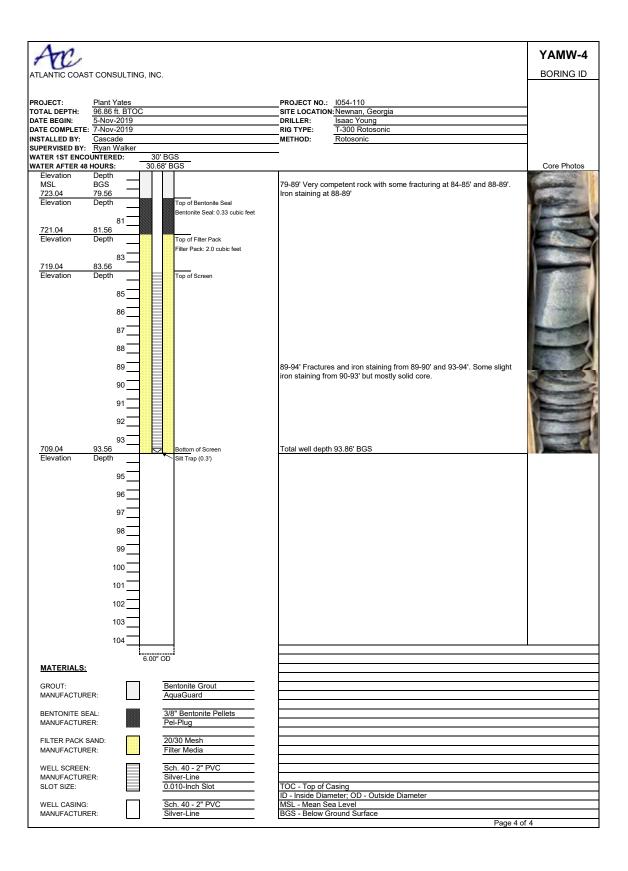
Arc					YAMW-3
ATLANTIC COAS	T CONSULTING	G, INC.			BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 91.96 ft. BTO	^		PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	
DATE BEGIN:	5-Nov-2019			DRILLER: Isaac Young	†
DATE COMPLETE:				RIG TYPE: T-300 Rotosonic	
INSTALLED BY: SUPERVISED BY:	Cascade Ryan Walker			METHOD: Rotosonic	+
WATER 1ST ENCO	UNTERED:		BGS		
WATER AFTER 48 Elevation	Depth	34.44	'BGS		Core Photos
MSL	BGS				
	54				
	55				
	56				
	57				
	58				
	59			59-69' As above, large rock pieces/less fractures	(ii)
	60			No iron staining (5/10)	
	61				1
	62				The state of the s
	63				A GENERAL
					R-THEFT
	64				STATE OF THE PARTY
	65				
	66				Colonia de la co
	67				
	68				
	69			69-79' (10/10)	1
	70			72-74' more fractured than previous 74-79' lots of iron staining. Some quartzite.	To the said
					VARIOUS AND
	71				
	72				
	73				CONTRACT:
	7,				/ Allegan
718.61	74 74.59				
Elevation	Depth		Top of Bentonite Seal Bentonite Seal: 0.33 cubic feet		1
	76		Bentonite Seal: 0.33 cubic feet		
716.61 Elevation	76.59 Depth		Top of Filter Pack		No.
Lievation	Бериі		Filter Pack: 2.0 cubic feet		
	78				
	ţ	6.00" C	DD		
MATERIALS:					
GROUT:			Bentonite Grout		
MANUFACTURE	ER:		AquaGuard		
BENTONITE SE			3/8" Bentonite Pellets		
MANUFACTURE	=R:	١.	Pel-Plug		
FILTER PACK S			20/30 Mesh		
MANUFACTURE	EK:		Filter Media		
WELL SCREEN:			Sch. 40 - 2" PVC		
MANUFACTURE SLOT SIZE:	ER.		Silver-Line 0.010-Inch Slot	TOC - Top of Casing	
				ID - Inside Diameter; OD - Outside Diameter	
WELL CASING: MANUFACTURE			Sch. 40 - 2" PVC Silver-Line	MSL - Mean Sea Level BGS - Below Ground Surface	
	<u> </u>		•	Page 3 of	f 4

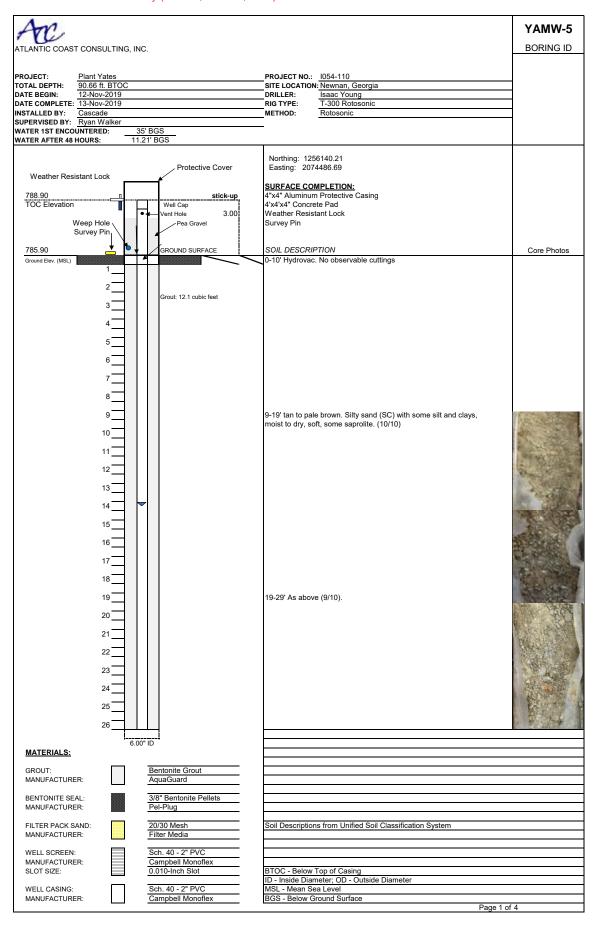
AC				YAMW-3
ATLANTIC COAS	T CONSULTING, I	INC.		BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 91.96 ft. BTOC		PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	4
DATE BEGIN:	5-Nov-2019		DRILLER: Isaac Young	
DATE COMPLETE: INSTALLED BY:			RIG TYPE: T-300 Rotosonic	4
SUPERVISED BY:	Cascade Ryan Walker		METHOD: Rotosonic	-
WATER 1ST ENCO WATER AFTER 48		30' BGS 34.44' BGS		Core Photos
714.61	78.59	Top of Screen	79-88' As above. Iron staining stops at ~81'	Core Filolos
Elevation	80			No.
	84 85 86 87 88			
704.61	88.59	Bottom of Screen	Total well depth 88.89' BGS	
Elevation	Depth	Silt Trap (0.3')		
	90			
	91			
	92			
	93			
	94			
	95			
	96			
	97			
	98			
	99			
	100			
	101			
	102			
	103			
	104			1
	6.	.00" OD		
MATERIALS:				
GROUT: MANUFACTURE	ER:	Bentonite Grout AquaGuard		
BENTONITE SE		3/8" Bentonite Pellets		
MANUFACTURE		Pel-Plug		
FILTER PACK S		20/30 Mesh		
MANUFACTURE	_	Filter Media		
WELL SCREEN MANUFACTURE		Sch. 40 - 2" PVC Silver-Line		
SLOT SIZE:		0.010-Inch Slot	TOC - Top of Casing	
WELL CASING:		Sch. 40 - 2" PVC	ID - Inside Diameter; OD - Outside Diameter MSL - Mean Sea Level	
MANUFACTURE		Silver-Line	BGS - Below Ground Surface	
			Page 4 c	N 4



AC					YAMW-4
ATLANTIC COAS	T CONSULTING	, INC.			BORING ID
PROJECT:	Plant Yates			PROJECT NO.: 1054-110	
TOTAL DEPTH: DATE BEGIN:	96.86 ft. BTOC 5-Nov-2019			SITE LOCATION: Newnan, Georgia  DRILLER: Isaac Young	
DATE COMPLETE:	7-Nov-2019			RIG TYPE: T-300 Rotosonic	
INSTALLED BY: SUPERVISED BY:	Cascade Ryan Walker			METHOD: Rotosonic	
WATER 1ST ENCO			BGS	_	
WATER AFTER 48		30.68	B' BGS		Core Photos
Elevation MSL	28	•		30-35' Mostly sand silt with 10% gravel-hard to friable 35-37' Clayey sand-high to medium plasticity 37-40' Return to silty sand with medium to highly weathered rock. Micaceous	を発
	38 39 40 41 42 43 43 44			40-44' As above (5/5)	
	45 46 47 48			45-49' Hard rock. Metamorphic gneiss banding/schist. Iron staining present. 44-45' Moderately hard, somewhat friable. (5/5)	
	50 51 52			49-59' As above, moderately weathered, somewhat friable, iron staining present (2/10)	
MATERIALS:		6.00" O	DD		
		_			
GROUT: MANUFACTURE	ER:		Bentonite Grout AquaGuard		
BENTONITE SE	EAL:	-	3/8" Bentonite Pellets Pel-Plug		
FILTER PACK S	SAND:	3	20/30 Mesh		
MANUFACTURE	EK:	_	Filter Media		
WELL SCREEN			Sch. 40 - 2" PVC		
MANUFACTURE SLOT SIZE:	ER:		Silver-Line 0.010-Inch Slot	TOC - Top of Casing	
		_		ID - Inside Diameter; OD - Outside Diameter	
WELL CASING: MANUFACTURE			Sch. 40 - 2" PVC Silver-Line	MSL - Mean Sea Level BGS - Below Ground Surface	
	· <u> </u>			Page 2 of	4

AC					YAMW-4
ATLANTIC COAS	T CONSULTING	G, INC.			BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 96.86 ft. BTOC	;		PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	-
DATE BEGIN:	5-Nov-2019			DRILLER: Isaac Young	
DATE COMPLETE: INSTALLED BY:	7-Nov-2019 Cascade			RIG TYPE:         T-300 Rotosonic           METHOD:         Rotosonic	-
SUPERVISED BY:	Ryan Walker				1
WATER 1ST ENCO WATER AFTER 48		30' BC			Core Photos
Elevation	Depth				
MSL	BGS				-
	54				
	55				1
	56				
	57				The same of the
	58				12007
	59			59-69' As above except less weathered rock, non friable. Still some	
				iron staining present (8/10)	
	60				The same of
	61				
	62				The same of
	63				
					The state of the s
	64				
	65				
	66				
	67				
	68				No. of Lot,
	69			69-79' As aboveexcept rock is more weathered. Section of quartzite at 73-74'. Iron staining ends at 77'. (7/10)	
	70			at 73-74. IION stalling ends at 77. (7710)	
	71				
	72				
	73				
	74				
	75				
	76				100 To 10
	77				The state of the s
	78				是經濟學
		6.00" OD	]		
MATERIALS:		0.00 OD			
GROUT:		Be	entonite Grout		
MANUFACTURE	ER:		quaGuard		
BENTONITE SE	AL:	3/	8" Bentonite Pellets		
MANUFACTURE			el-Plug		
FILTER PACK S	AND:	20	0/30 Mesh		
MANUFACTURE			Iter Media		
WELL SCREEN:	: 🔳		ch. 40 - 2" PVC		
MANUFACTURE		Si	lver-Line 010-Inch Slot	TOC - Top of Casing	
SLOT SIZE:				ID - Inside Diameter; OD - Outside Diameter	
WELL CASING: MANUFACTURE			ch. 40 - 2" PVC Iver-Line	MSL - Mean Sea Level BGS - Below Ground Surface	
IVIAINOFACTURE	_1	31	IVOI LIIIO	Page 3 of	4



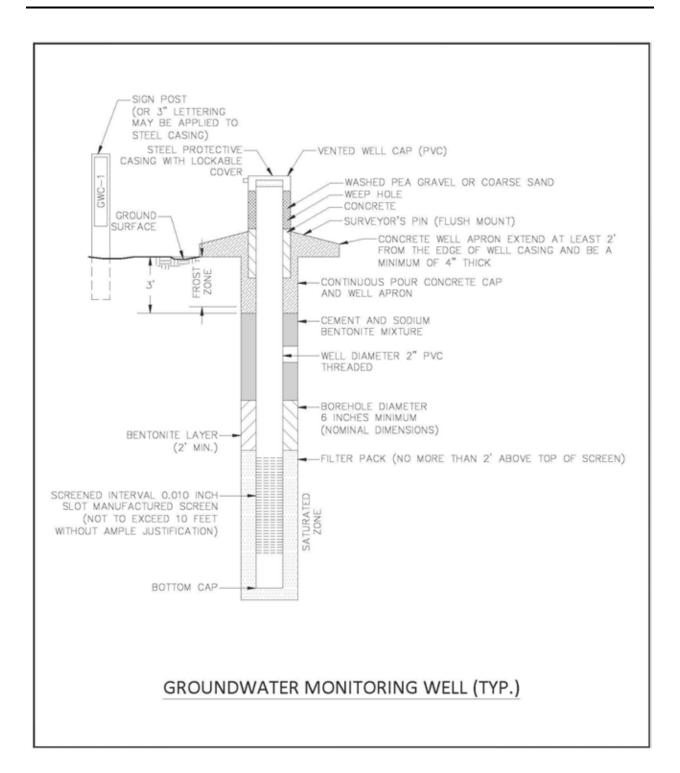


Arc				YAMW-5
ATLANTIC COAST	CONSULTING, IN	C.		BORING ID
	Plant Yates 90.66 ft. BTOC		PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	
DATE BEGIN: 1	12-Nov-2019		DRILLER: Isaac Young	
DATE COMPLETE: 1	Cascade		RIG TYPE:         T-300 Rotosonic           METHOD:         Rotosonic	
SUPERVISED BY: F		5' BGS		]
WATER AFTER 48 H	OURS: 11.	21' BGS		Core Photos
	28		29-39' Harder drilling. Gniessic banding with schist. Iron and manganese staining. Some fractures present.	
	32		39-49' As above except no iron staining (7/10)	
	40			
	49 50 51 52		49-59' As above (8/10)	
MATERIALS:	6.00	" OD		
GROUT:		Bentonite Grout		
MANUFACTURER	₹:	AquaGuard		
BENTONITE SEAL MANUFACTURER		3/8" Bentonite Pellets Pel-Plug		
FILTER PACK SAI MANUFACTURER		20/30 Mesh Filter Media		
WELL SCREEN: MANUFACTURER SLOT SIZE:	R:	Sch. 40 - 2" PVC Silver-Line 0.010-Inch Slot	TOC - Top of Casing ID - Inside Diameter; OD - Outside Diameter	
WELL CASING: MANUFACTURER	R:	Sch. 40 - 2" PVC Silver-Line	MSL - Mean Sea Level BGS - Below Ground Surface Page 2 of	4

AC				YAMW-5
ATLANTIC COAS	T CONSULTING	G, INC.		BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 90.66 ft. BTOO	C	PROJECT NO.: 1054-110 SITE LOCATION: Newnan, Georgia	-
DATE BEGIN:	12-Nov-2019		DRILLER: Isaac Young	
DATE COMPLETE: INSTALLED BY:	Cascade		RIG TYPE:         T-300 Rotosonic           METHOD:         Rotosonic	-
SUPERVISED BY:	Ryan Walker			
WATER 1ST ENCO WATER AFTER 48		35' BGS 11.21' BGS		Core Photos
Elevation MSL	Depth BGS			
	54			
				Control (
	55			
	56			The state of the s
	57			
	58			
	59		59-69' As above except more competent rock. Iron staining and fractures present (6/10)	
	60		mactures present (0/10)	
	61			N. B
	62			
	63			
	64			
	65			
	66			SECTION OF
				-
	67			
	68			
	69		69-79' As above except no iron staining (9/10)	
	70	-		
	71			1
	72			
712.56 Elevation	73.34 Depth	Top of Bentonite Seal		5
Lievation	74	Bentonite Seal: 0.33 cubic feet		
710.56	75.34			2
Elevation	Depth 76	Top of Filter Pack Filter Pack: 2.0 cubic feet		
708.56	77.34			
Elevation	Depth 78	Top of Screen		
	į	6.00" OD		
MATERIALS:				
GROUT: MANUFACTUR	ED:	Bentonite Grout AquaGuard		
BENTONITE SE		•		
MANUFACTUR		3/8" Bentonite Pellets Pel-Plug		
FILTER PACK S MANUFACTUR		20/30 Mesh Filter Media		
WELL SCREEN		Sch. 40 - 2" PVC		
MANUFACTURI SLOT SIZE:	ER:	Silver-Line 0.010-Inch Slot	TOC - Top of Casing	
WELL CASING:		Sch. 40 - 2" PVC	ID - Inside Diameter; OD - Outside Diameter MSL - Mean Sea Level	
MANUFACTUR		Silver-Line	BGS - Below Ground Surface	f /

An							YAMW-5
ATLANTIC COAS	T CONSULTING	, INC.					BORING ID
PROJECT: TOTAL DEPTH:	Plant Yates 90.66 ft. BTOC	:		PROJECT NO.: SITE LOCATION	: Newnan, Georgia		
DATE BEGIN: DATE COMPLETE:	12-Nov-2019 13-Nov-2019			DRILLER: RIG TYPE:	T-300 Rotosonic		
INSTALLED BY: SUPERVISED BY:	Cascade Ryan Walker			METHOD:	Rotosonic		
WATER 1ST ENCO	UNTERED:	35' BG		_			
Elevation	Depth	11.21' B	GS	79-87' As above	e except rock slightly weather	ed. Iron staining and	Core Photos
698.56 Elevation	BGS		Bottom of Screen Silt Trap (0.3')	Total well depth			
MATERIALS:		6.00" OD					
GROUT:			ntonite Grout				
MANUFACTURE	R:	Aqı	uaGuard				
BENTONITE SE MANUFACTURE	ER:	Pel	Bentonite Pellets -Plug				
FILTER PACK S MANUFACTURE	≣R:	Filt	30 Mesh er Media				
WELL SCREEN: MANUFACTURE SLOT SIZE:		Silv 0.0	n. 40 - 2" PVC ver-Line 10-Inch Slot	TOC - Top of C	asing neter; OD - Outside Diameter		
WELL CASING: MANUFACTURE			n. 40 - 2" PVC ver-Line	MSL - Mean Se BGS - Below G	a Level	Page 4 of	4

## APPENDIX D. GROUNDWATER MONITORING WELL DETAIL



## APPENDIX E. GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling will be conducted using 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.

Sample 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 DO) approximately every three to five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:

±0.1 for pH

±5% for specific conductance (conductivity)

 $\pm 10\%$  for DO where DO > 0.5 mg/L (milligrams per liter). 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 and such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.
- 8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results, 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. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.
- 9. All sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.
- 10. Sample containers and preservative will be appropriate for the analytical method being used.
- 11. Information contained on sample container labels will include:
  - a. Name of facility
  - b. Date and time of sampling
  - c. Sample description (well number)
  - d. Sampler's initials
  - e. Preservatives
  - f. Analytical method(s)
- 12. After samples are collected, samplers will remove all non-dedicated equipment. Upon completion of all activity the well will be closed and locked.
- 13. Samples will be delivered to the laboratory following appropriate COC and temperature control requirements. The goal for sample delivery will be within 48 hours of collection; however, at no time will samples be analyzed after the method-prescribed hold time.

Throughout the sampling process, new latex or nitrile gloves will be worn by the sampling personnel. A clean pair of new, disposable gloves will be worn each time a different location is sampled, and new gloves 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 NTU; however, samples may be collected where turbidity is less than 10 NTU and the stabilization criteria described above are met.

If sample turbidity is greater than 10 NTU 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 10 NTU or less, as follows:

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

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