GROUNDWATER MONITORING PLAN FOR INACTIVE CCR UNIT

AP1

FORMER PLANT ARKWRIGHT
MACON-BIBB COUNTY, GEORGIA
FOR

Georgia Power

AUGUST 2025

Stantec

Stantec Consulting Services Inc.
1110 Market Street, Suite 214A, Chattanooga, TN 37402
Phone (423) 800-5350, Fax (423) 800-5351

TABLE OF CONTENTS

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 Rules of Solid Waste Management. According to 391-3-4-.01, a Qualified Groundwater Scientist is "a professional engineer or geologist registered to practice in Georgia who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action." The design of the groundwater monitoring system was developed in compliance with the Rules of Solid Waste Management, Chapter 391-3-4-.10.

Signature: _____

Date: 08/14/2025

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 Former Plant Arkwright's AP1 (site). This plan meets the requirements of EPD rules and uses EPD's Manual for Groundwater Monitoring dated September 1991 as a guide. Groundwater sampling locations for the site are presented in Figure 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.

The Ash Pond 1 (AP1) at Former Plant Arkwright located in Bibb County, Georgia received a closure certificate on June 30, 2010, under Solid Waste Permit Number 011-030D(LI). On September 11, 2024, the Georgia EPD approved a minor modification of the above-mentioned permit for the completion of the AP1 Southpoint Improvement project (Stantec, 2024b). The scope of work for the Southpoint project at AP1 included, but was not limited to, the removal of approximately 42,700 cubic yards of CCR from the southern tip of AP1 and subsequent stabilization of the Southpoint excavation footprint. Excavated CCR was stockpiled within the northern footprint of AP1 and overlain with a final cover comprised of 18 inches of cover soil, 6 inches of vegetation-supporting soil and sod. The site is currently in post-closure care. Per the Closure Plan, CCR will be removed from AP1, which will significantly affect final (closure) topography and may also affect the site's potentiometric surface. Since CCR will be removed from AP1, the current downgradient wells will be abandoned as part of removal, and additional groundwater monitoring wells will be installed as shown in Figure 1 of Appendix A.

This plan has been generated with consideration to these factors and in accordance with Solid Waste Management Rule 391-3-4-.10(6). Pursuant to 391-3-4-.02(3)(b)(6), Georgia Power will seek EPD concurrence with groundwater monitoring well installation and submit a minor modification to the EPD prior to the installation or decommissioning of monitoring wells. Well installation and abandonment must be directed by a qualified groundwater scientist. Any changes to the monitoring network, as shown in Figure 1 of Appendix A, will be incorporated via a minor modification to the GWMP.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

AP1 is generally underlain by clayey or silty sands with occasional sandy clay and silt zones, underlain by a silty sand saprolite and bedrock. Borehole drilling performed at the site indicate overburden thickness ranging from 22 feet to 62 feet, overlying a thin layer (5 to 10 feet) of partially weathered rock. The underlying bedrock consist of quartzofeldspathic gneiss, horneblende gneiss, and schist.

Based on the August 2024 readings from the interim monitoring wells, the potentiometric surface ranges from approximately 324 – 290 feet (NAVD88) (15 – 57 feet below ground surface) respectively in the northern and southern portions of the site. A potentiometric surface map with readings recorded in August 2024 of the AP1 area is provided as Figure 3 of Appendix A. These interim wells were installed to evaluate the uppermost aquifer at the site, which includes the alluvial sediments and residual soils above bedrock. The site is bordered to the east by the Ocmulgee River, and to the west and south by Beaverdam Creek, both of which influence the potentiometric surface.

The groundwater hydraulic gradients within the uppermost aquifer beneath AP1 were calculated using the groundwater elevation data from the August 19, 2024, gauging event. Hydraulic gradients were calculated along the northeast flow path at the north end of AP1 between wells AP1PZ-11 and AP1PZ-1 and at the southerly flow path on the southwest side of AP1 between AP1PZ-10 and AP1PZ-5. The average hydraulic gradients along the northern and southerly groundwater flow path lines associated with AP1 are 0.024 feet per foot (ft/ft) and 0.009 ft/ft, respectively. The supporting calculations are presented in Table A2 of Appendix A. The general trajectory of the flow paths used in the calculations and associated potentiometric contour lines are shown on Figure 3 of Appendix A.

The groundwater flow velocity at AP1 was calculated using a derivation of Darcy's Law. Specifically,

$$V = \frac{K * i}{n_e}$$

Where:

$$V = Groundwater\ Flow\ Velocity \left(\frac{feet}{day}\right)$$

$$K = Average\ Hydraulic\ Conductivity\ of\ the\ Aquifer \left(\frac{feet}{day}\right)$$

$$i = Horizontal\ Hydraulic\ Gradient \left(\frac{feet}{foot}\right)$$

$$n_e = Effective\ Porosity\ (unitless)$$

With these variables determined, and accounting for the averaged hydraulic gradient discussed above for August 2024, event, the results for groundwater flow velocities ranged from 0.0051 feet/day in the southern portion of the Site to 0.15 feet/day in the northeastern portion of the Site (1.9 and 54 feet/year, respectively) on August 19, 2024.. The flow velocity calculations are provided in Table A2 of Appendix A.

Boring logs and well construction diagrams for the existing groundwater monitoring wells are provided in Appendix B.

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost aquifer beneath the site. Locations are selected based on site geologic and hydrogeologic considerations. GPC follows the recommendation as stated in Chapter 2 of the Manual for Groundwater Monitoring (1991) to determine well spacing based on site-specific conditions.

The interim well network installed between 2018 and 2021 at AP1 is shown on Figure 2 of Appendix A. A summary table of temporary monitoring well details for the interim monitoring wells are provided in Table A1 of Appendix A. A copy of the drillers bond that was on file with the Water Well Standards Advisory Council at the time of well installation for the interim monitoring network is provided in Appendix B. Since CCR will be removed from AP1, the remaining downgradient wells will be abandoned as part of removal activities. The upgradient wells (AP1GWA-1 and 2) may remain throughout removal activities and be incorporated into AP1's permitted groundwater monitoring network. Following removal of CCR, approximately 25 additional groundwater monitoring wells will be installed as shown in Figure 1 of Appendix A. The wells along the eastern (i.e. Ocmulgee River) side of AP1 are proposed to be installed along the upper Access Road. The proposed wells are located across the site at approximate elevation 317 feet or higher. These locations were selected to limit the potential inundation and subsequent required redevelopment for these wells. These wells are located at or above the 25-year flood elevation (317 feet) at AP1. 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.

As mentioned previously, CCR will be removed from AP1, which will significantly lower the site's topography and may also affect the potentiometric surface during post-closure. However, it is not expected that removal of CCR will affect the general groundwater flow direction toward the Ocmulgee River and Beaverdam Creek.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

4.1 Drilling

A variety of well drilling methods are available for the purpose of installing groundwater monitoring 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 will be selected to minimize the disturbance of subsurface materials and will not cause impact to the groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in site-specific geology. Monitoring wells will be installed using the most current version of the USEPA SESD SESDGUID-101-R# as a general guide for best practices. Drilling equipment will be decontaminated before use and between borehole locations using the procedures described in the most current version of the USEPA SESD Operating Procedure for Field Equipment Cleaning and Decontamination (USEPA, SESDGUID-205-R#). Drilling and well installation activities will be directed by a qualified groundwater scientist.

Sampling and/or coring may be used to help determine the stratigraphy and geology at the well location. Samples and cores will be logged by trained personnel working under the direction of a qualified groundwater scientist. Screen depths will be chosen based on the depth of the uppermost aquifer.

All drilling for any subsurface hydrologic investigation, or installation or abandonment of groundwater monitoring wells at a landfill in Georgia will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. A copy of the drillers bond that was on file with the Water Well Standards Advisory Council at the time of well installation for the interim monitoring network is provided in Appendix B. Georgia Power will submit a minor modification to the EPD following installation or decommissioning of monitoring wells.

4.2 Design and Construction

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

WELL CASINGS AND SCREENS

American Society for Testing and Materials (ASTM), National Science Foundation (NSF) rated, Schedule 40, 2-inch 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 these specifications prove ineffective for developing a well with sufficient yield or acceptable turbidity, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

Pre-packed dual-wall well screens 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. If utilized, pre-packed well screens will be installed following general industry standards and using the current version of USEPA SESDGUID-101-R# as a general guide. If the dual-wall pre-packed-screened wells do not yield sufficient water or are excessively turbid after development, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

FILTER PACK AND ANNULAR SEAL

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

The materials used to seal the annular space in the boring above the well pack must prevent hydraulic communication between strata and prevent migration from overlying areas into the well screen interval. A minimum of two feet of bentonite (chips, pellets, or slurry) will be placed immediately above the filter pack. The bentonite seal will extend up to the base of any overlying confining zone or the top of the water-bearing zone to prevent cementitious grout from entering the water-bearing or screened 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 two 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 or well pad extending outward with at least 1 foot from the edge of the well casing and sloped to drain water away from the well.

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

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

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

WELL DEVELOPMENT

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

In low yielding wells, potable water may be added to the well to facilitate surging of the well screen interval and removal of fine-grained sediment. If water is added, the volume will be documented and at minimum, 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 well's 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. Well development data will be included in the well installation report.

4.3 Abandonment

Per Georgia Rule 391-3-4-.14(10)(b), monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the GA EPD. Monitoring wells will be abandoned using industry-accepted practices and using the *Manual for Groundwater*

Monitoring (1991) and Georgia Water Well Standards Act (1985) as guides. The wells will be abandoned under the direction of a qualified groundwater scientist. Neat portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. Any piezometers or groundwater wells located within the footprint of the CCR unit will be over-drilled prior to abandonment.

4.4 Documentation

Within 60 days of the construction, survey, and development or abandonment of groundwater monitoring wells, a well installation report will be submitted to the Georgia EPD by a qualified groundwater scientist. The following information documenting the construction, development, and/or abandonment of each groundwater well will be included in the report.

- Well identification
- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council
- Dates of drilling and initial well emplacement
- Drilling method and drilling fluid used (if applicable)
- Borehole diameter and well casing diameter
- Well depth (±0.1 ft.)
- Well location (±0.5 ft.)
- 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 annual seal material
- Type of protective well cap and sump dimensions for each well
- Documentation of ground surface elevation (±0.01 ft.)

- Documentation of top of casing elevation (±0.01 ft.)
- Certification by a Georgia-registered professional surveyor 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
- Well development date
- Well turbidity following development
- Narrative of well development method – specific well development procedures
- 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.

Samples from each groundwater well will be collected and analyzed for 40 CFR 257, Subpart D, Appendix III and Appendix IV test parameters. The monitoring frequency for the Appendix III and Appendix IV parameters will be at least semi-annual during the interim monitoring period, during closure activities, and during the post-CCR removal monitoring period. Groundwater monitoring parameters and frequency are presented in Table 1.

Following CCR Removal and installation of the proposed Groundwater Monitoring Network, 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 Appendix III will be at least semi-annual during the active life of the facility and the post-closure care period. If required, Georgia Power will conduct assessment monitoring in accordance with the Georgia Rules for Solid Waste Management Chapter 391-3-4-.10 to also include 40 CFR, Subpart D Appendix IV test parameters.

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), American Society for Testing and Materials (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 Conference (NELAC). Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

Table 1. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

MONITORING PARAMETER		GROUNDWATER MONITORING	
		Background	Semi-Annual Events
Field Parameters	Temperature	X	X
	pH	X	X
	Oxidation Reduction Potential (ORP)	X	X
	Turbidity	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
Appendix III (Detection test parameters from 40 CFR 257, Subpart D)	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH (field)	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
Appendix IV (Assessment test parameters from 40 CFR 257, Subpart D)	Antimony	X	Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4-.10(6).
	Arsenic	X	
	Barium	X	
	Beryllium	X	
	Cadmium	X	
	Chromium	X	
	Cobalt	X	
	Fluoride	X	
	Lead	X	
	Lithium	X	
	Mercury	X	
	Molybdenum	X	
	Selenium	X	
	Thallium	X	
	Radium 226 & 228	X	

Table 2. ANALYTICAL METHODS

Parameters	EPA Method Number
Boron	6010D/6020B
Calcium	6010D/6020B
Chloride	300.0/300.1/9250/9251/9253/9056A
Fluoride	300.0/300.1/9214/9056A
pH	150.1/field/90405C
Sulfate	9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	160.1/ Standard Method 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	7470
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 C, 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.

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

Per Georgia Rule 391-3-4-.14(10)(b) 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.

The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

7. CHAIN-OF-CUSTODY

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

- Sample identification numbers
- Signature of collector
- Date and time of collection
- Sample type
- Sample point identification
- Number of sample containers
- Signature of person(s) involved in the chain of possession
- Date and time of transfer/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 will relinquish possession and the samples will be received by the new owner.

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

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

8. FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL

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

- Field Equipment Rinsate Blanks - Where sampling equipment is not new or dedicated, an equipment rinsate blank will be collected at a rate of one blank per 10 samples using non-dedicated equipment.
- Field Duplicates - Field duplicates are collected by filling additional containers at the same location, and the field duplicate is assigned a unique sample identification number. One blind field duplicate will be collected for every 20 samples.
- Field Blanks - Field blanks are collected in the field using the same water source that is used for decontamination. The water is poured directly into the supplied sample containers in the field and submitted to the laboratory for analysis of target constituents. One field blank will be collected for every 20 samples.

Calibration of field instruments will occur daily and follow the recommended (specific) instrument calibration procedures provided by the manufacturer and/or equipment manual specific to each instrument. Daily calibration will be documented on field forms and these field forms will be included in all groundwater monitoring reports. Instruments will be recalibrated as necessary (e.g., when calibration checks indicate significant variability), and all checks and recalibration steps will be documented on field calibration forms. Calibration of the instruments will also be checked if any readings during sampling activities are suspect. Replacement probes and meters will be obtained as a corrective action in the event that recalibration does not improve instrument function. Calibration field forms will be provided with the semi-annual groundwater monitoring reports.

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

9. REPORTING RESULTS

A semi-annual groundwater report that documents the results of sampling and analysis will be submitted to EPD, added to the site Operating Record, and posted to Georgia Power's CCR Website. Semi-annual groundwater monitoring reports will be submitted to the EPD within 90 days of receipt and analysis 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, and the dates the samples were collected.
2. A brief overview of purging/sampling methodologies.
3. Discussion of results.
4. Potentiometric surface contour map for the aquifer(s) being monitored, signed and sealed by a Georgia-registered P.G. or P.E.
5. 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.
6. Groundwater flow rate and direction calculations.
7. Identification of any groundwater wells that were installed or abandoned during the preceding year, along with a narrative description of why these actions were taken.
8. Laboratory Reports.
9. COC documentation.
10. Field sampling logs including field instrument calibration, indicator parameters and parameter stabilization data.
11. 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.
12. Documentation of non-functioning wells (i.e., dry wells).
13. Table of current analytical results for each well.
14. Certification by a qualified groundwater scientist.

Once the long-term monitoring well network is installed, the additional items will be included in the semi-annual reports:

1. A narrative describing whether the samples were required by the detection or assessment monitoring programs.

2. 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).

3. Recommendations for the future monitoring consistent with the Rules.

4. If applicable, semi-annual assessment monitoring results.

5. Any alternate source demonstration completed during the previous monitoring period, if applicable.

6. Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL).

7. Statistical analyses of Appendix III statistically significant increases (SSI) and Appendix IV statistically significant limits (SSL), including trend analyses of SSLs of Appendix IV constituents if the unit is currently undergoing assessment of corrective measures.

8. Plume delineation (if applicable)

9. Updated potable water well survey (annually, if applicable)

10. STATISTICAL ANALYSIS

Statistical analysis of the sampling events will begin once the long term groundwater monitoring network is installed and background sampling has been completed as required by 391-3-4-.10(6).

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. Statistical analysis techniques are consistent with the USEPA document Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance (Unified Guidance) (USEPA, 2009).

According to EPD rules (391-3-4-.10(6)(a)), 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 hazardous 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

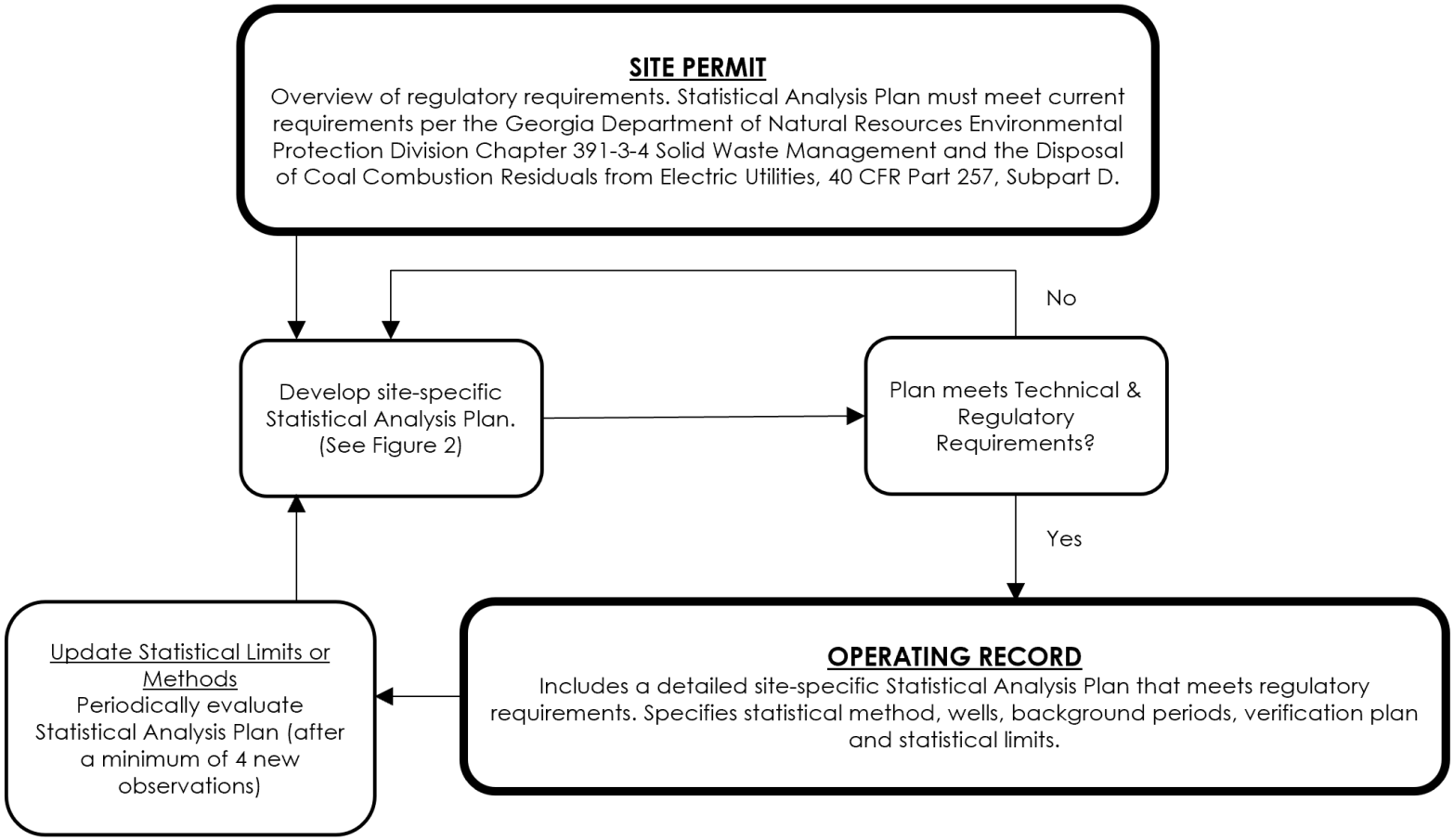
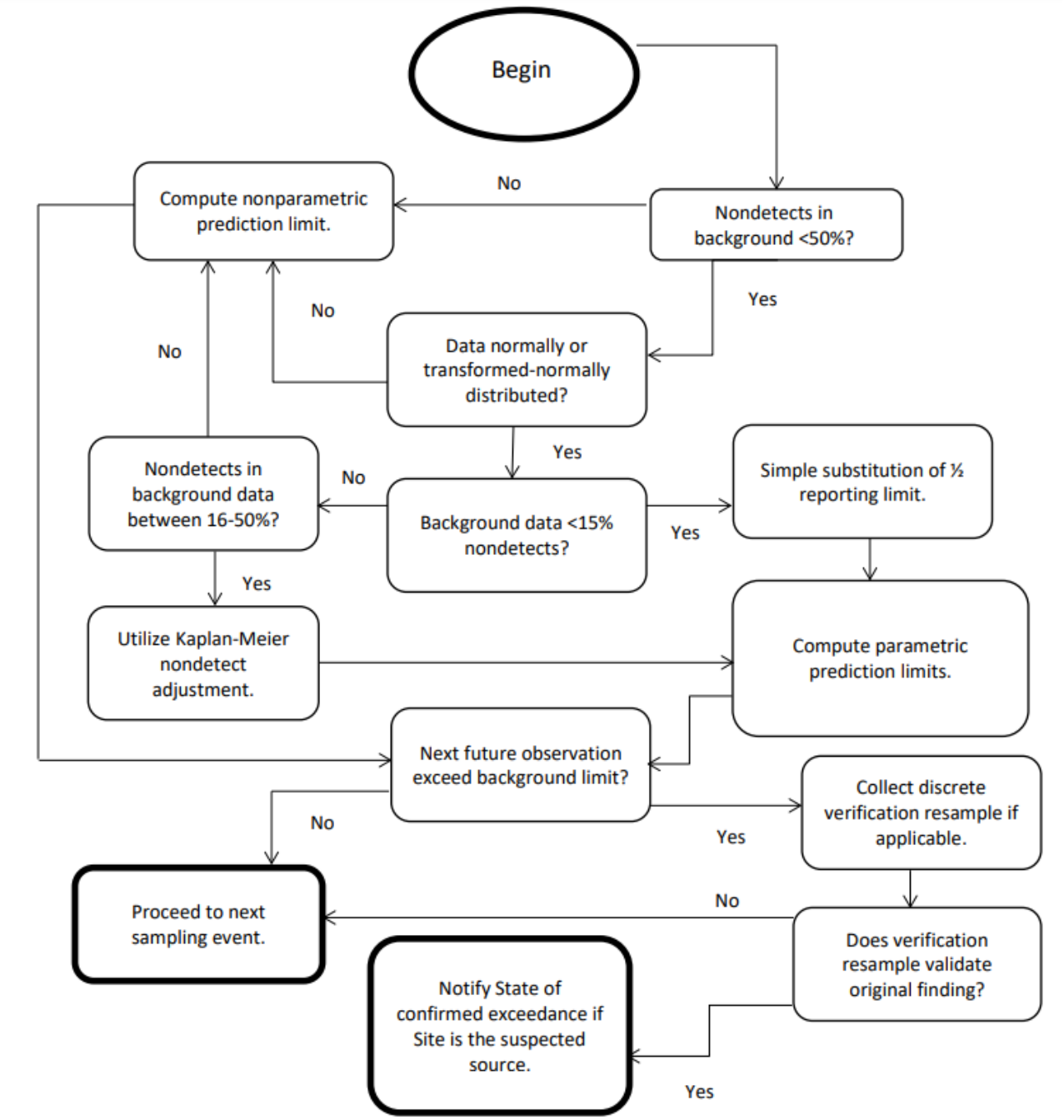


Figure 2. Decision Logic for Computing Prediction Intervals



11. REFERENCES

Freeze, R. A. and Cherry, JA. 1979, Groundwater, Prentice-Hall, Englewood Cliffs, New Jersey 604pp.

Georgia Environmental Protection Division (EPD), 1991. Manual for Ground Water Monitoring.

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

Jacobs, 2018. Limited Hydrogeologic Assessment Report for Inactive CCR Landfill – Georgia Power Company Former Plant Arkwright – AP1 Landfill, Macon, Bibb County, Georgia, November.

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

United States Environmental Protection Agency (USEPA), Region 4 Science and Ecosystem Support Division (SESD), 2013. Operating Procedure for Design and Installation of Monitoring Wells. SESDGUID-101-R1.

United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2013. Operating Procedure for Design and Installation of Monitoring Wells. SESDGUID-101-R1

United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2015. Operating Procedure for Field Equipment Cleaning and Decontamination. SESDPROC-205- R3.

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

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

USEPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20),

APPENDICES

A. MONITORING SYSTEM DETAILS

B. INTERIM GROUNDWATER MONITORING WELL DETAILS

C. GROUNDWATER SAMPLING PROCEDURES

A. MONITORING SYSTEM DETAILS

Legend

- Monitoring Well
- Proposed Monitoring Well
- Beaverdam Creek
- Ash Pond 1 Permit Boundary
- Limit of Client Imagery (dated 1/2/2025)

0 400 800 Feet

(At original document size of 11x17)
1:4,800

N

Stantec

Georgia Power

Project Location
Macon, Georgia

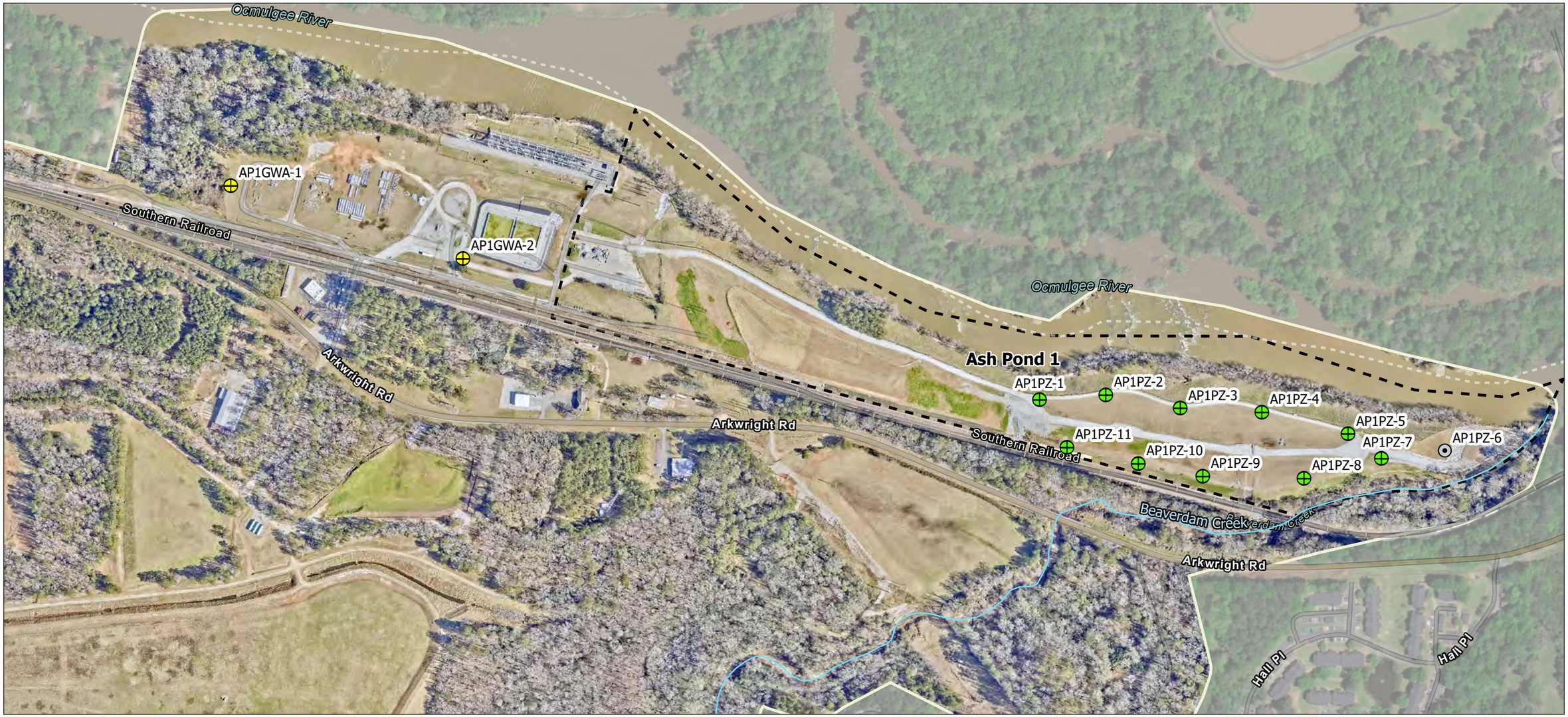
Prepared by DMB on 7/11/2025
TR by AW on 7/11/2025
IR by AW on 7/11/2025

Client/Project 175518252
Georgia Power
AP1 Permit Application
Plant Arkwright Ash Pond 1

Figure No.
1

Title
Proposed Groundwater Monitoring Well Network

Notes
1. Coordinate System: NAD 1983 StatePlane Georgia West FIPS 1002 Feet
2. Data Sources: AP1 Boundary, Wells, and Beaverdam Creek provided by Southern Company Services, Wood Environment & Infrastructure Solutions, and Stantec.
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. Plant imagery provided by client and is dated 1/2/2025.



Notes

1. Coordinate System: NAD 1983 StatePlane Georgia West FIPS 1002 Feet

2. Data Sources: AP1 Boundary, Piezometers, Wells, Borings and Beaverdam Creek provided by Southern Company Services, Wood Environment & Infrastructure Solutions, and Stantec.

3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. Plant imagery provided by client and is dated 1/2/2025.

Legend

- Monitoring Well
- Piezometer
- Abandoned Piezometer
- Beaverdam Creek
- Ash Pond 1 Permit Boundary
- Limit of Client Imagery (dated 1/2/2025)

1. Piezometer AP1PZ-6 was abandoned in June of 2023 due to planned regrading activities in the vicinity of the piezometer.

0 400 800 Feet

(At original document size of 11x17)
1:4,800

N

Stantec

Georgia Power

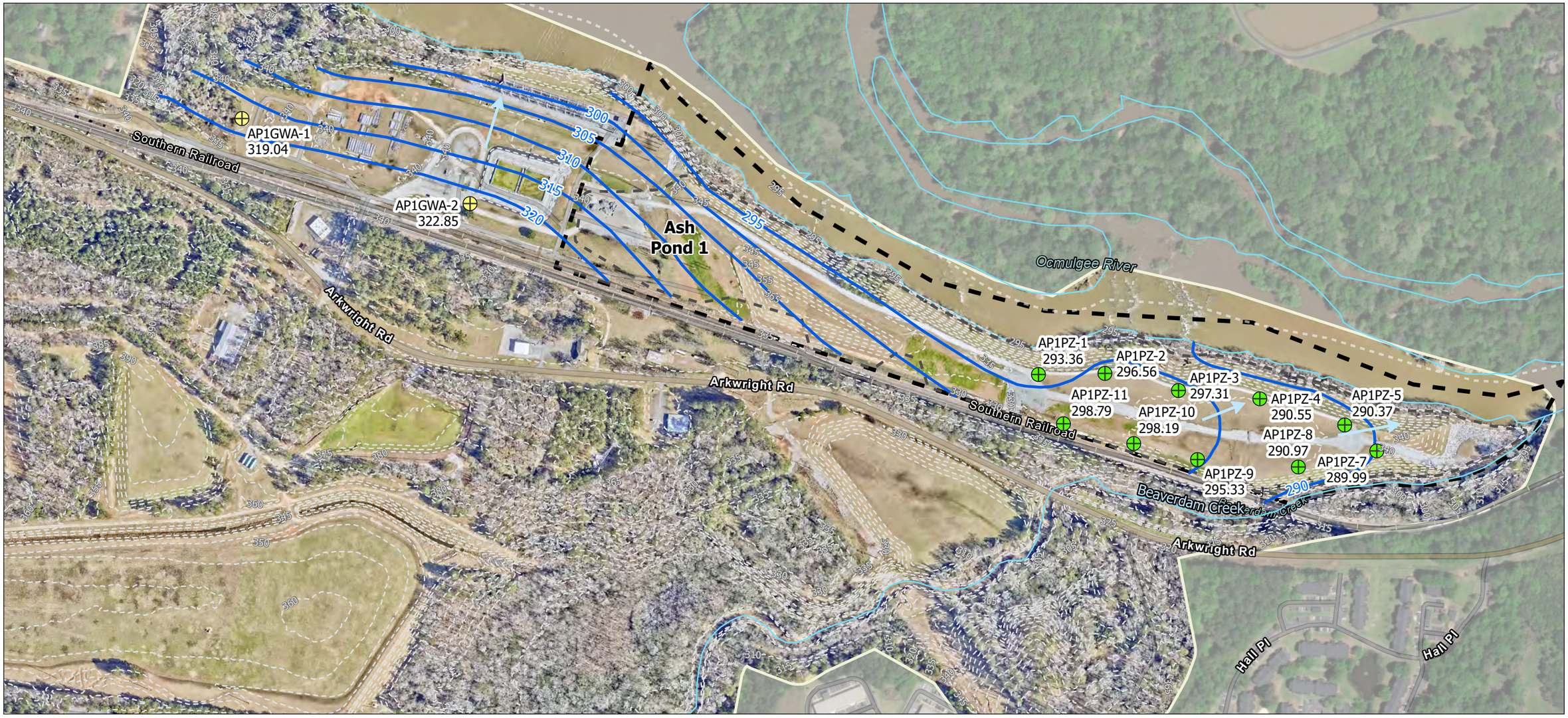
Project Location
Macon, Georgia

Prepared by DMB on 5/28/2025
TR by AW on 5/28/2025
IR by AW on 5/28/2025

Client/Project 175518252
Georgia Power
AP1 Permit Application
Plant Arkwright Ash Pond 1

Figure No.
2

Title
Piezometer and Well Location Map



Notes

1. Coordinate System: NAD 1983 StatePlane Georgia West FIPS 1002 Feet
2. Data Sources: AP1 Boundary, Piezometers, Topography, and Beaverdam Creek provided by Southern Company Services and Wood Environment & Infrastructure Solutions; Groundwater Contours, Flow Arrow, and Ocmulgee River provided by Stantec
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. Plant imagery provided by client and is dated 1/2/2025.

Legend

- Monitoring Well
- Piezometer
- Interpreted Groundwater Flow Direction
- Potentiometric Surface Contour (feet (ft) NAVD88)
- Beaverdam Creek/Ocmulgee River (Approximate)
- Topographic Contour Dec. 2024 (5 ft interval)
- Approximate Limits of Ash Pond 1
- Ash Pond 1 Permit Boundary
- Limit of Client Imagery (dated 1/2/2025)

293.36 Groundwater Elevation (ft NAVD88)
AP1GWA-1 and AP1GWA-2 not included in contouring
NAVD88 - North American Vertical Datum of 1988

KATIE T. ROSS
GEORGIA REGISTERED PROFESSIONAL GEOLOGIST
No. 1776

0 400 800 Feet
(At original document size of 11x17)
1:4,800

N

Stantec

Georgia Power

Project Location
Macon, Georgia

Prepared by DMB on 5/28/2025
TR by PD on 5/28/2025
IR by AW on 5/28/2025

Client/Project
Georgia Power
AP1 Permit Application
Plant Arkwright Ash Pond 1

175518252

Figure No.
3

Title
Potentiometric Surface Contour Map
Ash Pond 1 - August 19, 2024

TABLE A1
SUMMARY OF PIEZOMETER CONSTRUCTION
Georgia Power Company - Plant Arkwright
AP1
Macon, Georgia

Well	Installation Date	Northing [1]	Easting [1]	Top of Casing Elevation (feet NAVD88)[2]	Ground Surface Elevation (feet NAVD88)[2]	Top of Screen Elevation (feet NAVD88)[3]	Bottom of Screen Elevation (feet NAVD88)[3]	Screen Length (feet)	Groundwater Zone Screened	Hydraulic Location
AP1GWA-1	4/20/2018	1066048.91	2439462.98	345.44	342.28	318.6	308.6	10.0	Overburden/ Bedrock	Upgradient
AP1GWA-2	4/20/2018	1065095.10	2439623.37	341.42	338.55	320.9	310.9	10.0	Overburden/ Bedrock	Upgradient
AP1PZ-1	5/1/2021	1062799.79	2440164.34	338.97	335.92	261.9	251.9	10.0	Overburden/ Bedrock	Downgradient
AP1PZ-2	5/2/2021	1062573.21	2440300.14	339.58	336.64	287.5	277.5	10.0	Bedrock	Downgradient
AP1PZ-3	5/4/2021	1062286.28	2440387.36	338.57	335.50	281.7	271.7	10.0	Overburden/ Bedrock	Downgradient
AP1PZ-4	5/11/2021	1061989.86	2440520.65	338.36	334.98	281.4	271.4	10.0	Overburden	Downgradient
AP1PZ-5	5/13/2021	1061645.61	2440599.18	339.81	336.61	283.1	273.1	10.0	Overburden	Downgradient
AP1PZ-6*	5/13/2021	1061273.40	2440714.78	347.56	344.25	285.4	275.4	10.0	Overburden/PWR	Downgradient
AP1PZ-7	5/15/2021	1061483.62	2440573.47	340.91	337.56	273.7	263.7	10.0	Overburden	Downgradient
AP1PZ-8	5/16/2021	1061721.72	2440362.39	338.31	334.94	282.7	272.7	10.0	Overburden/PWR	Downgradient
AP1PZ-9	5/17/2021	1062083.33	2440187.59	337.62	334.14	291.4	281.4	10.0	Bedrock	Downgradient
AP1PZ-10	5/19/2021	1062334.74	2440116.05	338.38	335.07	292.4	282.4	10.0	Bedrock	Downgradient
AP1PZ-11	5/26/2021	1062615.94	2440044.48	338.98	335.78	276.2	266.2	10.0	Overburden	Downgradient

Notes:

1. Horizontal locations were referenced to Georgia State Plane West, North American Datum of 1983 (NAD 83).
2. Elevations are feet referenced to North American Vertical Datum of 1988 (NAVD 88).
3. Screen elevations were calculated using total depth and length of bottom sump.
4. PWR indicates Partially Weathered Rock.
5. * = Abandoned. AP1PZ-6 was abandoned on June 20 and 21, 2023.

TABLE A2
GROUNDWATER FLOW VELOCITY CALCULATIONS
Hydrogeologic Assessment Report
AP1
Georgia Power Company - Plant Arkwright
Macon, Georgia

Measurement Date	Location	Groundwater Elevations in Well Pairs (h_1, h_2)		Change in Elevation (dh)	Distance Measured (dl)	Hydraulic Gradient (i)	Average Horizontal Hydraulic Conductivity (K_h)		Estimated Effective Porosity (n_e)	Calculated Groundwater Flow Velocity (V)	
		h_1 (feet NAVD88)	h_2 (feet NAVD88)	(feet)	(feet)	(feet/foot)	(cm/sec)	(feet/day)	--	(feet/day)	(feet/year)
August 19, 2024	AP1PZ-10 to AP1PZ-5	298.19	290.37	7.82	842	0.009	3.86E-05	0.11	0.20	0.0051	1.9
	AP1PZ-11 to AP1PZ-1	298.79	293.36	5.43	222	0.024	4.24E-04	1.20	0.20	0.15	54

Notes:
1. The geometric mean of the in-situ horizontal hydraulic conductivity (K) slug test values measured at AP1PZ-10 (bedrock) and AP1PZ-5 (overburden) were used for the AP1PZ-10 to AP1PZ-5 average linear flow velocity calculation. The slug test K value measured at AP1PZ-11 (oveburden) was used for the AP1PZ-11 to AP1PZ-1 average linear flow velocity calculation.

2.An estimated effective porosity of 0.20 was selected for the silty sand to sandy silt gradation of the overburden based on a review of several sources, including Driscoll, 1986; Freeze and Cherry, 1979; and; US EPA, 1989.

B. INTERIM GROUNDWATER MONITORING WELL DETAILS

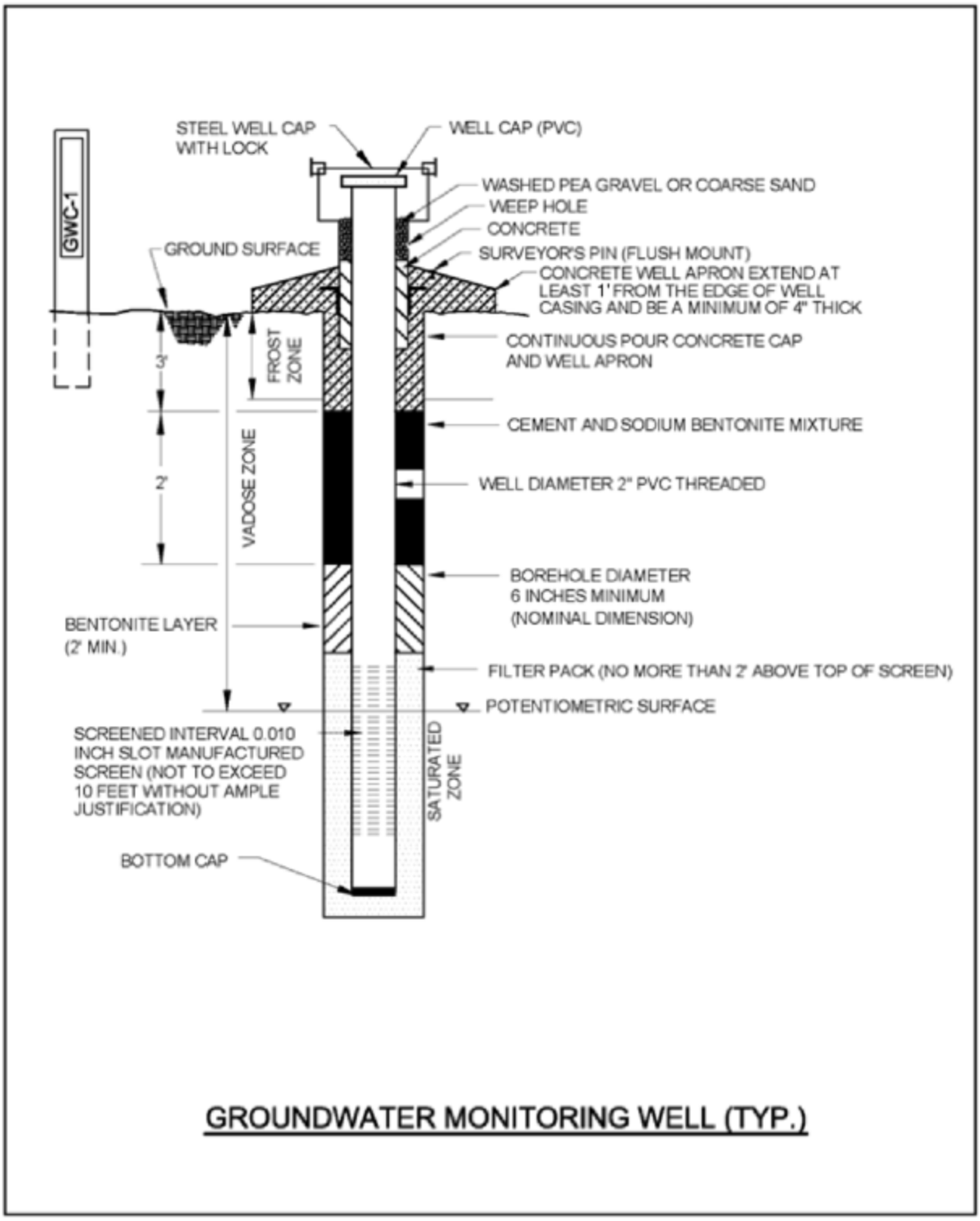


Figure B1. Typical Groundwater Monitoring Well – Stick Up

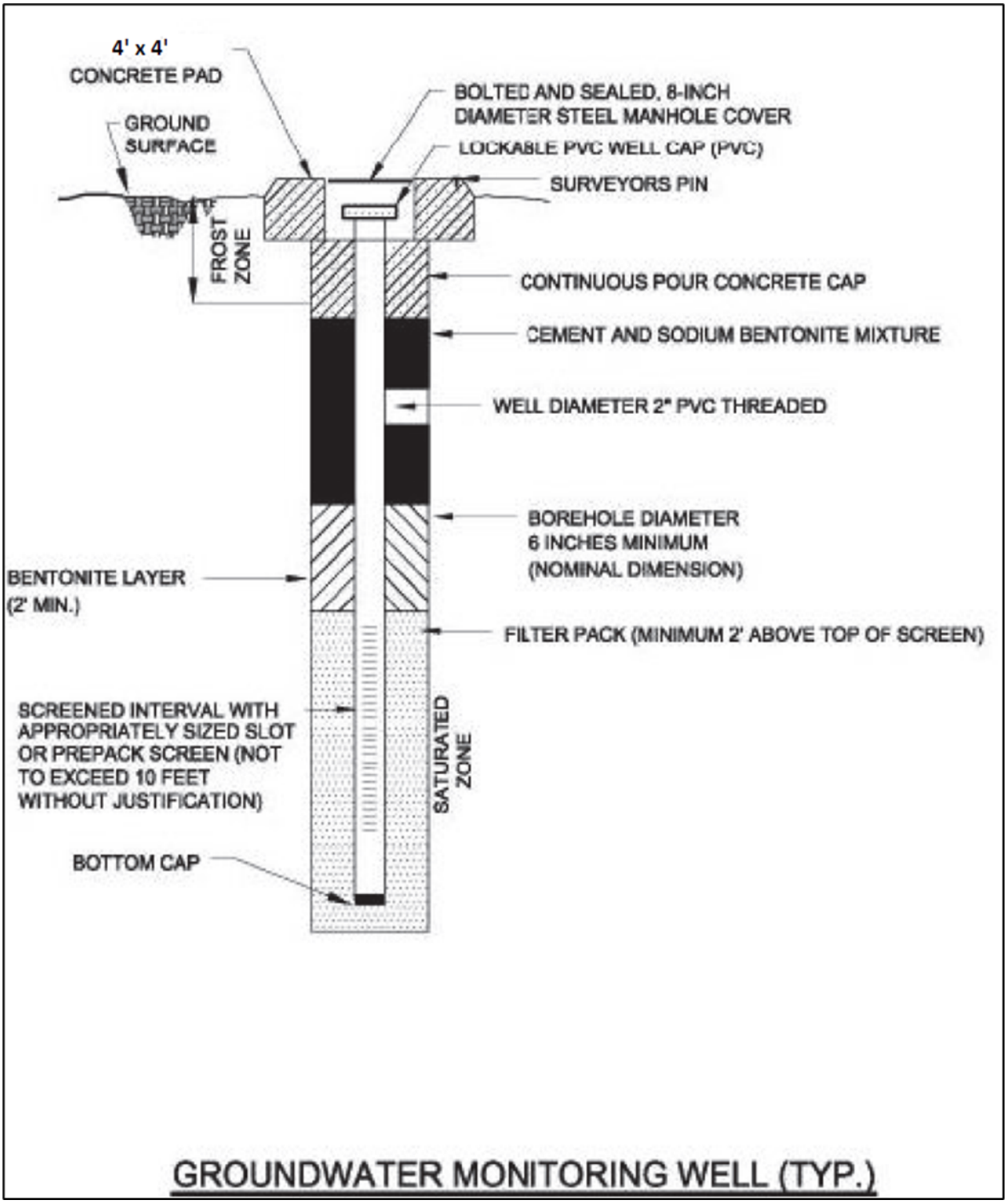


Figure B2. Typical Groundwater Monitoring Well – Flush Mount

JACOBS Jacobs Engineering

BORING NUMBER AP1GWA-1

CLIENT Georgia Power Company
PROJECT NAME Former Plant Arkwright Permitting
PROJECT NUMBER 35DK9205
PROJECT LOCATION Macon, Georgia
DATE STARTED 4/19/18 **COMPLETED** 4/20/18
GROUND ELEVATION 342.28 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic - TerraSonic TSCi 150T
AT TIME OF DRILLING DRILLING 22.00 ft / Elev 320.28 ft
LOGGED BY A. Hardesty **CHECKED BY** C. Hickman
AFTER DRILLING DRILLING 22.50 ft / Elev 319.78 ft on 5/3/18
NOTES
NORTHINGS 1066048.91 **EASTINGS** 2439462.98

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)
0		(CL) Medium to dark brown clay with sand and gravel, organic material, stiff, medium plasticity, wet.	Sonic		NA
			Sonic		NA
		(CL) Dark brown to reddish brown with black stones, clayey sandy gravel with black coal slag (fill material), firm, moist to dry.			
5		(CL) Medium to dark brown clay, stiff, low plasticity, moist.	Sonic		NA
10					
		(CL) Reddish brown clay, firm, medium plasticity, moist.	Sonic		NA
15		(SP) Reddish tan sand and gravel (10%), poorly sorted, loose, moist.	Sonic		NA
			Sonic		NA
		(SP) Tan to medium brown sand and gravel, poory sorted, loose, wet.			
20					
25		(CL) Gray to tan clay with sand and gravel, firm, wet.	Sonic		NA
			Sonic		NA
		(Bedrock) Light gray to tan and white, bedrock weathered shist, micaceous in areas, moist to dry, last 5' is dry.			
30					
35					

▲ SPT N VALUE ▲
20 40 60 80
● Moisture Content ●
20 40 60 80

(Continued Next Page)

JACOBS Jacobs Engineering

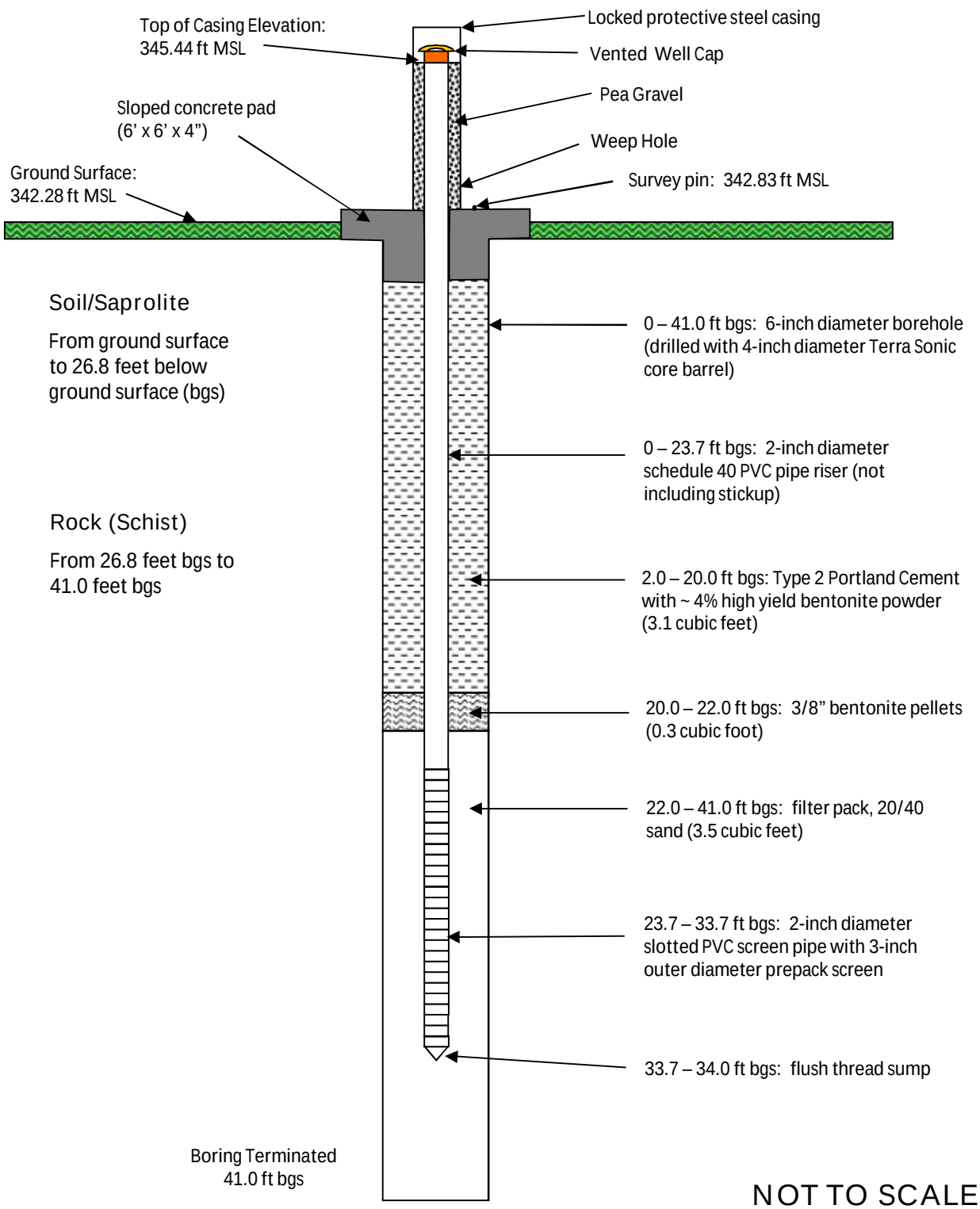
BORING NUMBER AP1GWA-1

CLIENT Georgia Power Company **PROJECT NAME** Former Plant Arkwright Permitting

PROJECT NUMBER 35DK9205 **PROJECT LOCATION** Macon, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲ 20 40 60 80 / ● Moisture Content ● 20 40 60 80
35		(Bedrock) Light gray to tan and white, bedrock weathered shist, micaceous in areas, moist to dry, last 5' is dry. *(continued)*				
40						

Bottom of borehole at 41.0 feet.



JACOBS	Georgia Power Former Plant Arkwright Bibb County, Georgia	DATE April 20, 2018 SCALE NA JOB NO.: 35DK9205
	AP1GWA-1 Construction Diagram	AS - BUILT

JACOBS Jacobs Engineering

BORING NUMBER AP1GWA-2

CLIENT Georgia Power Company
PROJECT NAME Former Plant Arkwright Permitting
PROJECT NUMBER 35DK9205
PROJECT LOCATION Macon, Georgia
DATE STARTED 4/20/18 **COMPLETED** 4/20/18
GROUND ELEVATION 338.55 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic - TerraSonic TSCi 150T
▽ **AT TIME OF DRILLING DRILLING** 14.50 ft / Elev 324.05 ft
LOGGED BY A. Hardesty **CHECKED BY** C. Hickman
▼ **AFTER DRILLING DRILLING** 15.41 ft / Elev 323.14 ft on 5/3/18
NOTES
NORTHINGS 1065095.1 **EASTINGS** 2439623.37

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)
0		(ML) Tan to medium brown silt, loose, moist.	Sonic		NA
		(CL) Dark bown to black clay with gravel, loose to soft, moist.	Sonic		NA
		(CL) Reddish brown sandy clay, firm to soft, and wet to moist.	Sonic		NA
5					
10					
		No recovery.	Sonic		NA
15		▽ ▼			
20					
25					
		(GM) Weathered bedrock, loose, clayey to sandy, wet.	Sonic		NA
30					
35					

▲ SPT N VALUE ▲
20 40 60 80
● Moisture Content ●
20 40 60 80

(Continued Next Page)

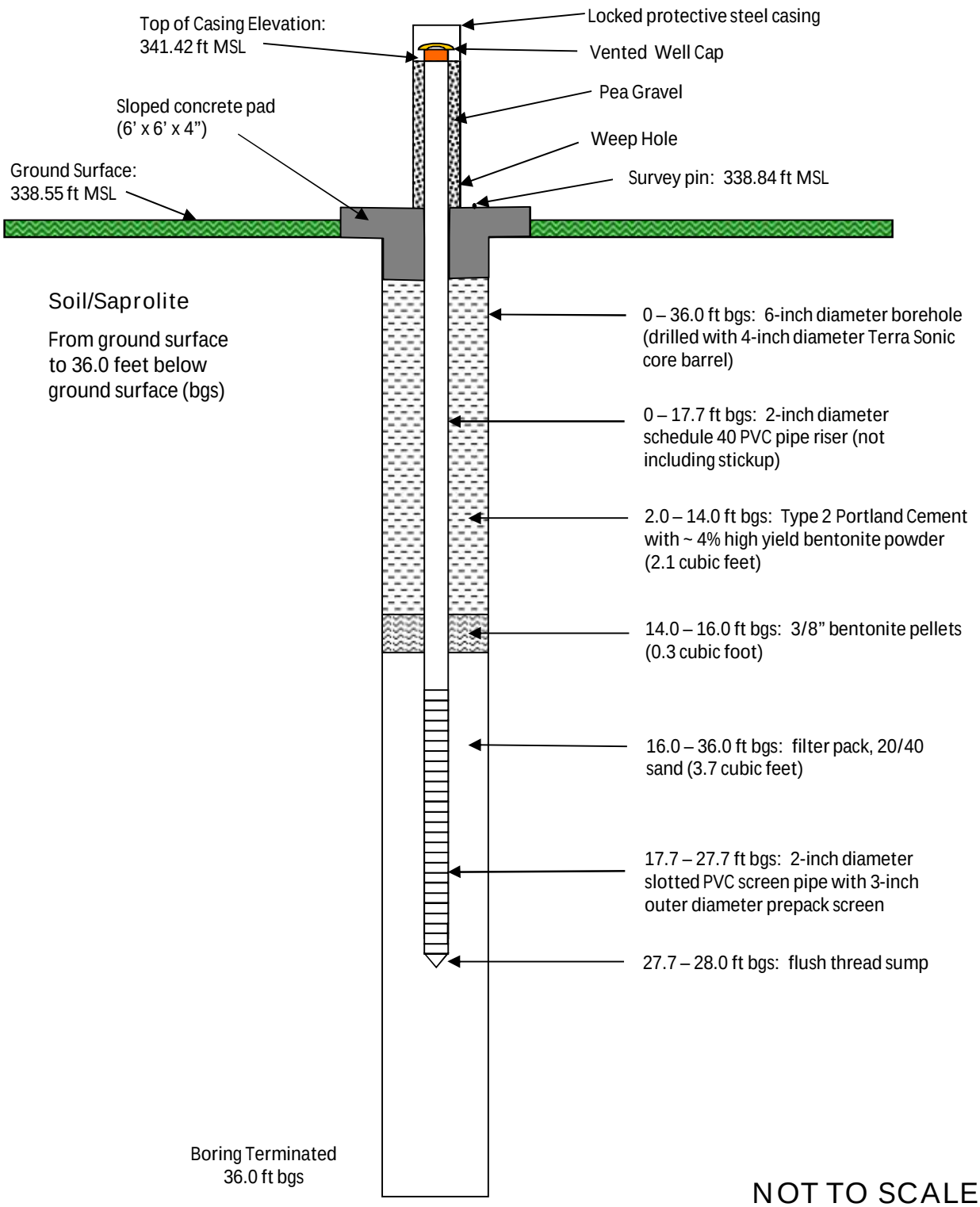
JACOBS Jacobs Engineering

BORING NUMBER AP1GWA-2

CLIENT Georgia Power Company **PROJECT NAME** Former Plant Arkwright Permitting

PROJECT NUMBER 35DK9205 **PROJECT LOCATION** Macon, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲ 20 40 60 80 / ● Moisture Content ● 20 40 60 80
35		(GM) Weathered bedrock, loose, clayey to sandy, wet. *(continued)*				
		Bottom of borehole at 36.0 feet.				



JACOBS	Georgia Power Former Plant Arkwright Bibb County, Georgia	DATE April 20, 2018 SCALE NA JOB NO.: 35DK9205
	AP1GWA-2 Construction Diagram	AS - BUILT

AP1PZ-1 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Smith
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 86.0 ft

COORDINATES N 1062799.79, E 2440164.34
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 335.92 ft NAVD 88
WELL TOC 338.97 ft NAVD 88

COMMENTS Start drilling 4/29/2021 and drilling completed 5/1/2021. Well construction completed on 5/14/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
0	0-11		#1 (100%)		Silty SAND, red/ brown, loose, dry, micaceous, trace clay	SM		336
2					Gravelly Silty SAND, dark grey to black, loose, dry, angular fine to coarse gravel, co-mingled ash	SW		334
4					Cobble seam 2.5-3.0 ft, angular fine to coarse gravel			332
6		5-6			Silty SAND, brown/ red, loose, dry, micaceous, trace clay	SM		330
8		7-8			Ash, black to dark grey, fine grained, very loose, dry to moist	ML		328
10		10-11						326
12	11-21		#2 (100%)		Split spoon from 11-12.5 ft using 1.5 ft spoon; Blow-counts: 6/13/16			324
14								322
16		15-16						320
18								318
20		20-21			Silty SAND with clay, light brown/green brown, loose	SM-SC		316
22	21-30		#3 (100%)		Ash, dark grey, loose, dry, with inter-mixed clays	ML-CL		314
24							Bentonite grout mix	312
26		24.5-25.5						310
28								308
30		28.8-30			SAND, tan/light brown/ dark grey/green, fine grained, very loose, poorly graded	SP		306
32	30-40		#4 (60%)					304
34								302
36		35-36						300
38								298
40								296
42	40-50	41-42	#5 (100%)		Clayey silty SAND, brown/grey, loose, moist, variable clay content with medium plasticity	SC-SM		294
44					Silty micaceous SAND, red/white/grey/green, loose, dry to moist, little clay decreasing with depth	SM-SC		292
46					46-50 ft saprolite texture			290
48		48-49						288

Disclaimer This bore log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-1 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
50								286
52	50-60		#6 (100%)		50-60 ft silty sand with relic weathered metamorphic rock texture, medium dense, dry	SM		284
54		54-55						282
56								280
58								278
60		59-60					Bentonite grout mix	276
62	60-67		#7 (100%)		Clayey micaceous silty SAND, green/grey, (soft, medium plasticity), moist	SC-SM		274
64					Silty micaceous SAND, light grey/brown, fine grained, loose, dry 64.5-65.6 ft CLAY seam, high plasticity	SM-CH		272
66		65-66			Saprolite, grey/white/black, dense, dry, weathered black micaeous rock	SM		270
68	67-70		#8 (100%)		Clayey silty micaceous SAND, dark grey/red/brown, medium dense, moist	SC-SM		268
70		69-70						266
72	70-80		#9 (100%)		Silty micaceous SAND, coarse grained, grey/green/red, dense, wet, saprolite, trace laminated cobble	SM-SW	Bentonite seal	264
74		74-75						262
76								260
78							Sand filter pack and pre-pack screen	258
80		79-80			CLAY, green/light brown/grey, low plasticity, moist	CL		256
82	80-86		#10 (100%)		Weathered Rock with micaceous silty SAND, black/grey, medium dense, moist	SM		254
84		84-85			Bedrock (mica schist), black/grey, dry Heavily weathered micaceous rock, mica schist breakable by hand, variable color grading to grey	SM		252
86					Bedrock (mica schist), black/grey, dry	-		250
					Boring terminated at 86 feet at top of bedrock			
88								248
90								246
92								244
94								242
96								240
98								238
100								236
102								234
104								232
106								230
108								228

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-2 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Smith
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 59.5 ft

COORDINATES N 1062573.21, E 2440300.14
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 336.64 ft NAVD 88
WELL TOC 339.58 ft NAVD 88

COMMENTS Start drilling 5/2/2021 and drilling completed 5/2/2021. Well construction completed on 5/14/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS	Elevation (ft)
0	0-10		#1 (100%)	Clayey silty SAND (fill), orange/brown, medium dense, moist	SM-SC	336
2					SW-SM	
				Gravelly SAND (fill), black, loose, dry, co-mingled ash, angular cobbles	SM	334
4				Silty micaceous SAND, brown/green/grey, loose, moist		
		4.5-5.5		Silty clayey SAND (fill), red/black, dense, dry, ash mixed in	SM-CL	332
6				Silty SAND with clay, tan/light brown, dense, high plasticity clay seams 6.6-6.7 ft & 7.9-8.0 ft	SM-SC	
		7-8				330
8				Ash, black, fine grained, very loose, moist to dry	ML	
		9-10				328
10				Clayey silty gravelly SAND, green 10-11 ft ash mixed in	SW-SC	
	10-18		#2 (100%)			326
		11-12		Gravelly silty SAND with clay, red/white specks, very loose, moist, coarse sub-rounded quartz gravel, (angular asphalt pieces) 16.8-17.4 ft sand seam, loose, no clays		
12						324
14						322
16						320
18						
	18-28		#3 (62%)			318
20						
						316
22						
24						314
		24-25				
26				Silty SAND, coarse grained, white/tan/light brown, loose, dry, angular quartz gravel, weathered gneiss appearance 27.2-27.3 white clay seam	SW-SM	312
		27-28				
28						310
	28-38		#4 (72%)			
30						308
						306
32				Silty micaceous SAND, variable color, loose, moist, saprolitic, varied clay content	SM-SC	
34						304
		35-36				
36						302
38						300
	38-48		#5 (100%)			
40		40-41				298
42						296
				Quartz vein, white, dry, powdered by drilling vibrations	-	294
44						
		44.6-45.6		Gravelly micaceous SAND, brown/orange/black, loose, dry, saprolite with relic structure	SW	292
46				Quartz vein, white with brown staining, moist 47.2-48 ft quartzite schist	-	290

Well Diagram: Bentonite grout mix; Bentonite seal; Sand filter pack and pre-pack screen

Disclaimer This bore log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-2 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
48	48-58		#6 (44%)		Fractured Bedrock (quartz mica schist), black/white, wet, brown staining of quartzite veins	-	Sand filter pack and pre-pack screen	288
50								286
52								284
54								282
56								280
58								278
60					Boring terminated at 59.5 feet approximately 15 feet into weathered bedrock			276
62								274
64								272
66								270
68								268
70								266
72								264
74								262
76								260
78								258
80								256
82								254
84								252
86								250
88								248
90								246
92								244
94								242
96								240
98								238
100								236
102								234
104								

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-3 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Smith
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 64.0 ft

COORDINATES N 1062286.28, E 2440387.36
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 335.50 ft NAVD 88
WELL TOC 338.57 ft NAVD 88

COMMENTS Start drilling 5/3/2021 and drilling completed 5/4/2021. Well construction completed on 5/14/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS	Elevation (ft)
0	0-9		#1 (100%)	Clayey silty micaceous SAND (fill), brown/red, medium dense, moist, some clays	SM-SC	335
4		4-5		Gravelly silty SAND with co-mingled ash, black/dark brown/white, loose, moist, white and black fine gravel, trace clays	SM-SW	332
6				Ash, dark grey/black, very loose, moist, fine black gravel	ML	330
8		7-8		Clayey silty SAND (fill), light red/ yellow, loose, moist, some clays	SM-SC	328
10	9-19	9-10	#2 (100%)	Gravelly silty SAND with co-mingled ash, green/grey/brown, loose, moist, coarse sub-rounded to angular gravel	SM-SW	326
12				Ash, black/green grey, loose, moist	ML	324
16		16.3-17.3		Clayey silty micaceous SAND, red/yellow, medium dense, moist, some fat clays	SM-SC	320
18						318
20	19-29		#3 (75%)	Gravelly silty SAND, fine grained, brown/yellow/white/tan, very loose, dry, powdery sand, trace clay, micaceous, saprolitic	SW-SC	316
22		22-23				314
24						312
26						310
28						308
30	29-39	30-31	#4 (100%)			306
32				CLAY, green/tan/light brown, soft, medium to high plasticity, moist	CL	304
34				Silty micaceous SAND, dark brown/tan/grey/white, loose, moist, saprolite/ relic structure	SM-SW	302
36		36-37		Rock lenses 37.8-38.3 ft (dry) and 50.9-51.0 ft		300
38						298
40	39-49		#5 (100%)			296
42		42-43				294
44						292
46						290
48		48-49				288

Well Diagram: Bentonite grout mix; Bentonite seal

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-3 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
50	49-59		#6 (100%)				Bentonite seal	286
52								284
54		54-55						282
56								280
58							Sand filter pack and pre-pack screen	278
60	59-64		#7 (60%)		Fractured Bedrock (quartz mica gneiss), black/white banded, wet, brown staining of fracture surfaces, large quartz crystals	-		276
62								274
64								272
66					Boring terminated at 64 feet at bedrock-overburden interface			270
68								268
70								266
72								264
74								262
76								260
78								258
80								256
82								254
84								252
86								250
88								248
90								246
92								244
94								242
96								240
98								238
100								236
102								234
104								232
106								230

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-4 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

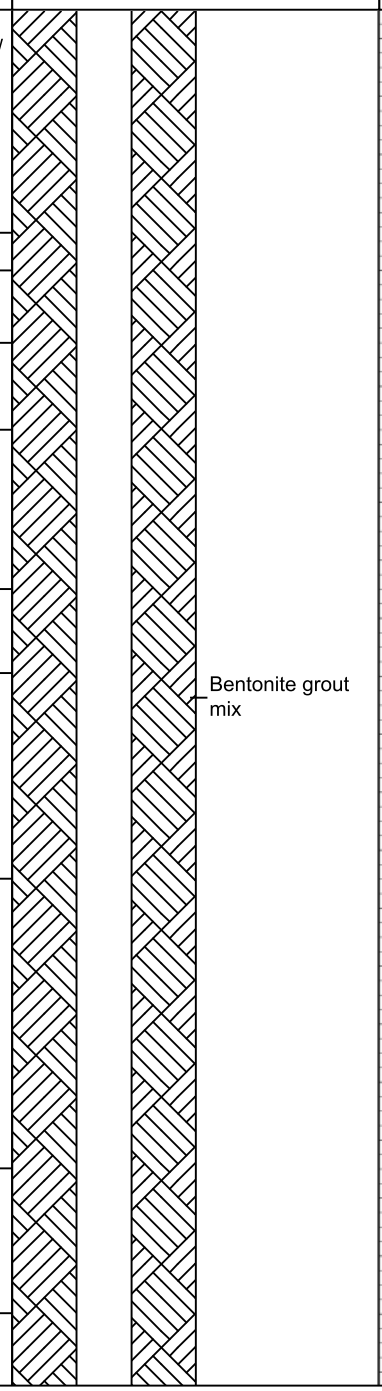
DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 65.0 ft

COORDINATES N 1061989.86, E 2440520.65
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 334.98 ft NAVD 88
WELL TOC 338.36 ft NAVD 88

COMMENTS Start drilling 5/10/2021 and drilling completed 5/11/2021. Well construction completed on 5/16/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
0	0-10		#1 (70%)	Hand auger refusal at 2.5-3 ft (gravel) Silty SAND with clays (fill), brown/red, loose, dry to moist	SM-SC SM-SW
4		4-5		4.9-5.2 ft coarse gravel seam, angular grained 5.2-7.7 ft co-mingled ash	
8		8-9		Ash, fine grained, black, very loose, moist	ML
10	10-20		#2 (90%)	Silty SAND with clays and co-mingled ash, dark grey/green brown, loose, dry	SM-SC
12				Fine SAND with fine gravel, dark brown/grey, very loose, dry	SP-SM
14		13-14		13.5-13.8 ft clayey ash lens, moist	
16				Ash, black/dark grey, very loose, dry	ML
20	20-30		#3 (50%)	Fine SAND with fine gravel, dark brown/grey, loose, dry	SM-SP
22		21.5-22.5			
24				Ash, black/dark grey, very loose, dry	ML
30	30-40		#4 (0%)	No recovery Soils are soft and loose	(ML)
40	40-50	40-41	#5 (100%)	CLAY, red, stiff, medium plasticity, moist	CL
46		46-47		CLAY, brown/red/grey, medium stiff, high plasticity, moist, micaceous, relic structure/ texture	CH

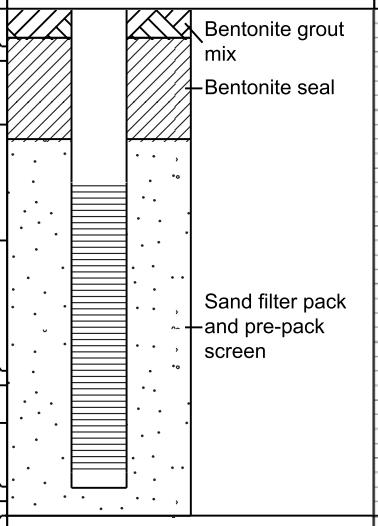


Elevation (ft)
334
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298
296
294
292
290
288

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-4 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS	Elevation (ft)
48				Gravelly fine SAND, light brown/grey, loose, moist, light brown/grey, moist, sub-angular small gravel	SW-SM	286
50	50-60	50-51	#6 (100%)	Gravelly SAND, medium grained, yellow/grey, loose, moist, sub-rounded to sub-angular small gravel	SW	284
52				50-51.5 ft black micaceous, coarse sub-rounded quartz gravel base	SM-CL	282
54				Silty SAND with clays, brown/orange, medium dense, moist		280
56		56-57		Gravelly fine SAND, white/tan/brown/grey, very loose, dry, large gravel, saprolite texture	SW-SM	278
58				59-59.9 ft Rock lens		276
60	60-65		#7 (100%)	Fine SAND, light brown/grey, medium dense, moist	SP	274
62		61-62		Clayey silty SAND, dark brown/red, medium dense, moist	SM-SC	272
64				Gravelly fine SAND, brown/white/grey, loose, moist, small angular quartz gravel, saprolite texture, clasts breakable by hand	SW-SM	270
66				Clayey silty SAND, dark brown/white/red, medium dense, moist, saprolite texture	SC-SM	268
68				Weathered fine crystalline rock with red staining, light grey/black/red, friable, saprolitic silts mixed in	ML	266
70				Boring terminated at 65 feet at a depth based on distance below groundwater level		264
72						262
74						260
76						258
78						256
80						254
82						252
84						250
86						248
88						246
90						244
92						242
94						240
96						238
98						236
100						234
102						232
104						



AP1PZ-5 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

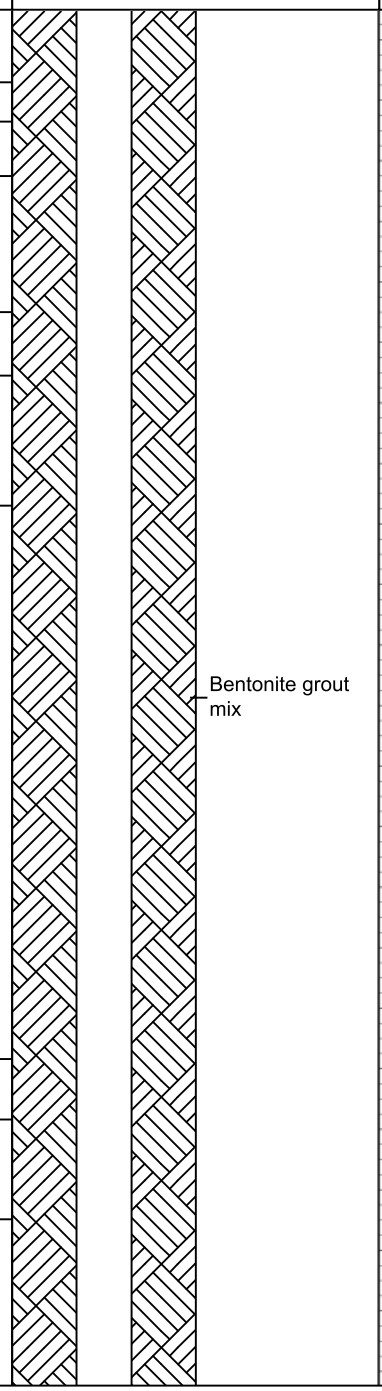
DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 64.0 ft

COORDINATES N 1061645.61, E 2440599.18
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 336.61 ft NAVD 88
WELL TOC 339.81 ft NAVD 88

COMMENTS Start and complete drilling on 5/12/2021. Well construction completed on 5/16/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
0	0-10		#1 (100%)	Hand auger Clayey Silty SAND (fill), red, medium dense, moist	SM-SC
2				Ash with fine gravel, dark grey/brown, loose, dry	ML-SM
4		4-5		Silty SAND with clays and ash seams, dark brown/red, very dense, dry, small gravel	SM-SC
6				Ash, dark grey/brown, loose, dry, small sub-rounded gravel inclusions, fine gravels mixed in and coarse sand	ML-SM
8				9.9-10 ft fine grained powder ash	
10		9-10			
10	10-20		#2 (100%)	Ash, fine grained, silver grey, very loose, dry	ML
12				Ash and co-mingled gravel, black/dark grey, very loose, moist, sub-rounded gravel	ML-SM
14		14-15		16.3-16.4 ft wood chip seam	
16				Ash, fine grained, silver grey, very loose, dry	ML
18					
20		19-20			
20	20-30		#3 (100%)		
22					
24		24-25			
26					
28					
30		29-30			
30	30-40		#4 (78%)		
32					
34					
36		35-36		Fine SAND, green/light brown, loose, moist	SP
38				Ash, fine grained, silver grey/brown, loose, moist	ML
40					
40	40-50	40-41	#5 (100%)	CLAY with micaceous silt, tan/light brown, soft, medium plasticity, moist	CH-ML
42					
44					



Elevation (ft)
336
334
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298
296
294
292

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-5 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
6		6-47			Clayey silty micaceous SAND, tan/brown/orange, medium dense, moist	SM SC	Bentonite grout mix	290
8					Fine SAND, tan, loose, moist	SP		288
50					Gravelly fine SAND, orange/light brown, loose, moist, small gravel	SW	Bentonite seal	
	50-60		6			SW-SC		286
52		51-52	(70%		Clayey silty SAND, fine grained, tan/light brown, medium dense, moist			284
5					Silty SAND, brown/white/tan/red, dense, dry, saprolite, compact brittle relic weathered rock texture with red staining	SM		282
56		56-57						
58							Sand filter pack and pre-pack screen	280
60								278
	60-64		#7					276
62		61-62	(75%					274
6					Boring terminated at 64 feet at a depth based on distance below groundwater level			
66								272
68								270
70								268
72								266
7								264
76								262
78								260
80								258
82								256
8								254
86								252
88								250
90								248
92								246
9								244
96								242
98								240
								238

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-6 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 70.0 ft

COORDINATES N 1061273.40, E 2440714.78
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 344.25 ft NAVD 88
WELL TOC 347.56 ft NAVD 88

COMMENTS Start drilling and complete drilling on 5/13/2021. Well construction completed on 5/26/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
0	0-10		#1		Hand auger	SM		344
2			(100%)		Silty micaceous SAND with some clays (fill), dark brown/red, medium dense, dry	SM-SC		342
4		3-4			Clayey silty micaceous SAND, red/ light brown/grey, medium dense, dry	ML		340
6					Gravelly ash grading to fine ash, black/brown/yellow, loose, moist, with sub-rounded gravel			338
8		8-9			6-6.2 ft silty sand seam Silty SAND co-mingled with ash, green/black, loose, dry, sub-rounded coarse gravel	SM-ML		336
10	10-20		#2		Ash, fine grained, black, very loose, dry, red/brown fine sand and slag-like inclusions from 10 to 20 ft	ML		334
12			(100%)					332
14		13-14			12.2-12.4 coarse gravel seam, sub-angular to sub-rounded			330
16								328
18								326
20		19-20						324
22	20-30		#3					322
24			(100%)			ML	Bentonite grout mix	320
26		24-25						318
28								316
30		29-30			SAND with co-mingled ash, medium grained, brown/black, loose, moist	SP-ML		314
32	30-40		#4		Ash, fined grained, black/brown (color variable), very loose, dry, trace coal inclusions	ML		312
34			(100%)					310
36		34-35						308
38								306
40		39-40						304
42	40-50		#5		SAND with co-mingled ash, medium grained grading to fine grained, dark brown/black, loose, wet	SP		302
44		43-44	(64%)		Gravelly silty SAND with co-mingled ash, silver grey/dark brown, medium dense, moist	SW		300
46					CLAY, dark brown, stiff, low plasticity, moist, rootlets throughout Fine SAND, dark brown, very loose, moist	CL SP		298

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-6 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
48								296
50	50-60	50-51	#6 (95%)		CLAY with sand, dark brown/red, stiff, high plasticity, moist	CH	Bentonite grout mix	294
52								292
54					Clayey SAND, grey/light brown, loose, moist	SC	Bentonite seal	290
56								288
58		58-59			Medium SAND, grey/yellow/light brown, loose, moist, with clays to 58.6 ft 58.6-58.8 ft coarse sub-rounded gravel seam 58.8-60 ft silver grey sand, moist 60-61.2 ft white quartz grains	SP-SW		286
60	60-65		#7 (100%)		CLAY with coarse gravels and cobbles, silver grey, soft, high plasticity, moist Fractured and weathered metamorphic rock present	CH	Sand filter pack and pre-pack screen	284
62		62-63						282
64					Weathered rock with silty sand, dark grey/white, saprolitic relic structure	SM		280
66	65-70		#8 (100%)					278
68		67-68						276
70					Boring terminated at 70 feet in weathered rock			274
72								272
74								270
76								268
78								266
80								264
82								262
84								260
86								258
88								256
90								254
92								252
94								250
96								248
98								246
100								244
102								242
104								240

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-7 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 75.0 ft

COORDINATES N 1061483.62, E 2440573.47
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 337.56 ft NAVD 88
WELL TOC 340.91 ft NAVD 88

COMMENTS Start drilling and complete drilling on 5/15/2021. Well construction completed on 5/26/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
0	0-10		#1 (70%)		Hand auger to 3 ft Clayey silty SAND (fill), red/brown, medium dense, moist, coarse grained angular gravel, rootlets present	SM-SC		
2								336
4		3-4			Ash, fine grained, black, very loose, dry	ML		334
6					Gravelly silty SAND with co-mingled ash, dark grey/black/dark brown, loose, dry, coarse sub-angular gravel	SW-SM		332
8					6.1-6.2 ft cobble	ML		330
10		9-10			Ash, fine grained, black, very loose, dry			328
12	10-20		#2 (90%)					326
14		14-15			Fine gravelly SAND with co-mingled ash, black/light brown, loose, dry, small gravel	SW-SM		324
16					Ash, fine grained, black, very loose, dry	ML		322
18		18-19			Clayey silty SAND, red/brown, medium dense, moist	SM-SC		320
20	20-30		#3 (100%)		CLAY, red/brown, soft, high plasticity, moist, micaceous 27-27.5 & 29.5-30 ft gravelly silty sand seams	CH-SC		318
22								316
24		24-25					Bentonite grout mix	314
26								312
28								310
30		29-30						308
32	30-40		#4 (100%)		Gravelly clayey silty SAND, red/brown/grey, medium dense, moist	SM-SC		306
34		34-35			Medium SAND, light brown, loose, wet 32.5-35 ft fine grained SAND	SP		304
36					Clayey silty SAND, green/grey, dense, moist, increasing clay content with depth	SM-SC		302
38								300
40		39-40			CLAY, red/ brown, very stiff, high plasticity, moist	CH		298
42	40-50		#5 (100%)					296
44		44-45			CLAY, soft, low plasticity, moist, micaceous	CL		294
46								292

Disclaimer This bore log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-7 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
48		48-49			Clayey micaceous silty SAND, red/brown/black, dense, moist, saprolitic texture	SM-SC		290
50	50-60		#6 (100%)		CLAY with silt, silver grey, soft, low plasticity, moist	CL		288
52					Gravelly SAND, medium grained, brown/red, loose, moist to wet, fine gravel	SW	Bentonite grout mix	286
54		53-54			Silty SAND with clay, brown/grey/white/tan/yellow/black, medium dense, moist, micaceous, saprolitic texture 56.5-57.7 ft saprolite with no clays	SM-SC		284
56								282
58		59-60						280
60	60-70		#7 (100%)				Bentonite seal	278
62								276
64		64-65						274
66								272
68		69-70					Sand filter pack and pre-pack screen	270
70	70-75		#8 (100%)		Fine SAND, light brown, very loose, moist	SP		268
72					Silty SAND. variable color, dense, moist, saprolite, seams of gravelly silty sands	SM-SW		266
74		74-75						264
76					Boring terminated at 75 feet			262
78								260
80								258
82								256
84								254
86								252
88								250
90								248
92								246
94								244
96								242
98								240
100								238
102								236

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-8 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

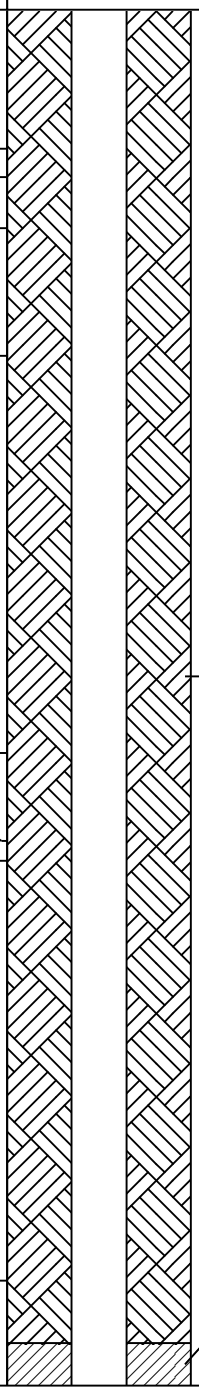
DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 63.0 ft

COORDINATES N 1061721.72, E 2440362.39
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 334.94 ft NAVD 88
WELL TOC 338.31 ft NAVD 88

COMMENTS Start drilling and complete drilling on 5/16/2021. Well construction completed on 5/26/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
0	0-10		#1 (60%)	Hand auger to 4 ft Silty SAND with clays (fill), red/orange, medium dense, dry, coarse grained gravel	SM-SC
4		4-5		Gravelly silty SAND with co-mingled ash, black, medium dense, dry, coarse sub-angular gravel	SW-SM
6				Gravelly silty SAND with clays, dark brown/red/grey, loose, dry, coarse sub-angular gravel (cobble @ 6.3 ft)	SM-SC
8				Ash, fine grained, silver grey/black/red/green, loose to very loose, dry to moist	ML
10		9-10			
10	10-20		#2 (88%)		ML-SW
12					
14		13-14		12.2-20 ft co-mingled with coarse gravel and medium sand	
16				25.8-26.2 ft coarse angular gravel seam	
18		17-18			
20	20-30		#3 (50%)		
22					
24					
26				CLAY, yellow/red/brown, soft, high plasticity, moist micaceous medium sands and fine gravels present from 18.2-19.3 ft	CH
28		27-28			
30				CLAY, red/brown, very stiff, medium plasticity, moist	CL
30	30-40		#4 (100%)	CLAY, red/tan/yellow, stiff, high plasticity, moist	CH
32					
34		33-34			
36					
38		38-39			
40	40-50		#5 (100%)		
42				CLAY, tan/yellow/tan/brown, soft, high plasticity, moist, medium micaceous sands from 43.8-44.8 ft	
44		43-44			
46				Silty micaceous SAND. dark brown/dark grey/tan/light brown/white, loose, moist, little clay, saprolite	SM-SW
48				48.7-50 ft parent rock texture	



Elevation (ft)
334
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298
296
294
292
290
288

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-8 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
50		49-50					Bentonite seal	286
	50-60		#6		Clayey silty SAND, dark brown, medium dense, moist, fine clayey sand at bottom	SM-SC		284
52			(100%)					
		53-54			Silty micaceous SAND. dark brown/light brown/tan/grey/white, medium dense, moist, saprolite, friable parent rock texture	SM-SW		282
54								
					SAND with silt, fine to medium grained, tan, loose, moist	SP	Sand filter pack and pre-pack screen	280
56		56-57						
								278
58					Silty SAND. grey/red/brown, dense to loose, dry to moist, saprolite	SM		
								276
60	60-63		#7		58.2-60 ft fractured rock with red/brown staining			
		61-62						274
62			(100%)		Weathered bedrock (mica schist), black/white, red staining on rock surfaces			
								272
64					Boring terminated at 63 feet			
								270
66								
								268
68								
								266
70								
								264
72								
								262
74								
								260
76								
								258
78								
								256
80								
								254
82								
								252
84								
								250
86								
								248
88								
								246
90								
								244
92								
								242
94								
								240
96								
								238
98								
								236
100								
								234
102								
								232
104								
								230
106								

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-9 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

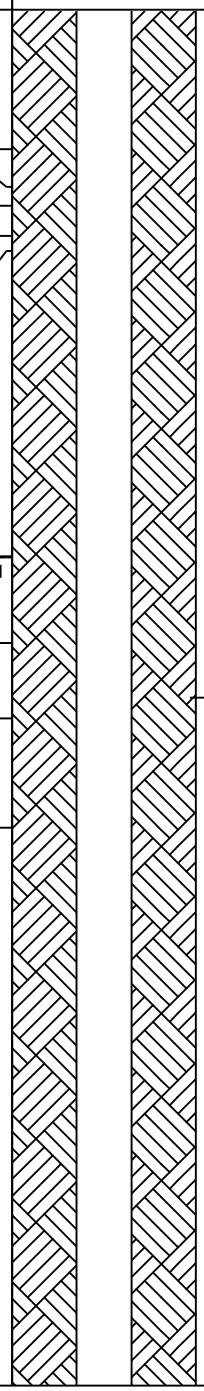
DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 55.0 ft

COORDINATES N 1062083.33, E 2440187.59
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 334.14 ft NAVD 88
WELL TOC 337.62 ft NAVD 88

COMMENTS Start drilling and complete drilling on 5/17/2021. Well construction completed on 5/25/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
0	0-10		#1 (70%)	Hand auger to 2 ft Silty micaceous SAND with some clays (fill), orange/yellow, loose, moist	SM-SC
2		2.5-3.5			
4				Ash with medium grained sand, black, loose, moist	ML
				Silty SAND with some clays (fill), red/black, medium dense, dry	SM-SC
6					ML
				Ash with medium grained sand, black, loose, dry to moist	CL
				CLAY, red, very stiff, medium plasticity, dry, micaceous	ML
8		8-9		Ash with medium grained sand, black/grey, loose to very loose, dry, coarse sub-angular gravel present 10-14.5 ft pieces of coal	
10	10-20		#2 (90%)		
12					
		13-14			
14					
				Gravelly SAND co-mingled with ash, medium to coarse grained, green/dark brown, very loose, dry	SW-SM
16					
		17-18		CLAY, bright red, very stiff, high plasticity, moist	CH
18					
				Clayey micaceous silty SAND, bright red/silver grey, medium dense, moist	SM-SC
20	20-30		#3 (77%)		
22		22-23		Silty SAND. tan/light brown/orange, loose, dry to moist, saprolite, friable clasts	SM
24				30-33 ft fractured rock (schist) with red staining	
				37.8-38 ft competent rock with some red staining	
26		26-27			
28					
30	30-33		#4 (100%)		
32		32-33			
34	33-38		#5 (100%)		
36					



Elevation (ft)
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-9 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
38							Bentonite grout mix	296
40	38-40		#6 (75%)		Banded gneiss, black/white/red/pink, dry, 20 degree foliation, no oxidation, no natural fractures, large 1-in quartz phenocrysts	-	Bentonite seal	294
42	40-50		#7 (80%)		40-40.3 ft visible natural vertical and horizontal fractures with staining			292
44								290
46								288
48							Sand filter pack and pre-pack screen	286
50	50-55		#8 (90%)					284
52								282
54								280
56					Boring terminated at 55 feet in bedrock			278
58								276
60								274
62								272
64								270
66								268
68								266
70								264
72								262
74								260
76								258
78								256
80								254

produced by ESlog.ESdat.net on 14 Sep 2021

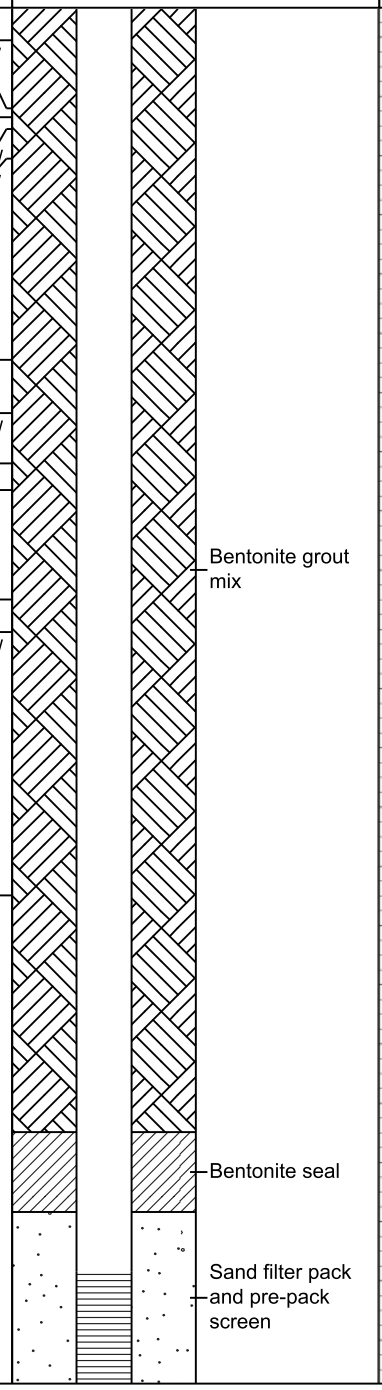
AP1PZ-10 BORING LOG

PROJECT NUMBER 6123211714	**DRILLING COMPANY** Cascade Drilling	**COORDINATES** N 1062334.74, E 2440116.05
PROJECT NAME Plant Arkwright	**DRILLER** J. Reinolds	**COORD SYS** Ga State Plane West (NAD 83)
CLIENT Georgia Power	**RIG TYPE/ METHOD** TSI CC150/ SONIC	**COMPLETION** Stick-up w/ protective casing
ADDRESS 5001 Arkwright Road Macon, GA	**CASING DIA.** 2-in I.D. PVC	**SURFACE ELEVATION** 335.07 ft NAVD 88
LOCATION Ash Pond 1	**BORING DEPTH** 60.0 ft	**WELL TOC** 338.38 ft NAVD 88

COMMENTS Start drilling 5/18/2021 and drilling completed 5/19/2021. Well construction completed on 5/27/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
0	0-10		#1 (93%)	Hand auger to 5 ft	CL
2		2-3		CLAY with fine sand and silt, light brown/red, soft, medium plasticity, moist	ML-SW
				Ash co-mingled with coarse gravel, black, loose, dry	SM
4				Silty SAND with clay and co-mingled ash, red/brown, loose, moist	SW
				Gravelly SAND, yellow/white, loose, dry, sub-rounded cobbles	SM-SW
6				Gravelly silty SAND and co-mingled ash, black/white/brown, loose, dry, fine sub-angular gravel	SC-SW
		7-8		Clayey silty SAND with gravel, bright red, loose, moist	
8				8.4-8.8 ft stiff clay seam	
10	10-20		#2 (82%)	9.2-9.3 ft loose fine gravel	
		12-13		Silty SAND with some clays, red/orange, medium dense, dry	SM-SC
12				Silty SAND, fine to coarse grained, tan/light brown, very loose, dry	SM-SW
14				Gravelly SAND, fine grained sand with fine to coarse gravels, light grey/beige, very loose, dry, sub-angular cobbles present (fill)	SW
				Silty SAND, fine grained, tan/light brown, very loose, dry	SM-SP
16		17-18			
18					
20	20-30		#3 (100%)	Clayey silty micaceous SAND, light brown, medium dense, moist	SM-SC
				Silty SAND, fine to coarse grained, tan/brown/white, loose, dry, saprolite, little fine gravel	SM-SW
22				23.5 ft, 25.6 ft, and 28.5 ft quartz lenses	
24		24.5-25.5			
26					
28					
30	30-38		#4 (100%)	Fractured metamorphic rock with red staining, black/red/white/tan, very dense, dry to moist	-
32					
34					
36					
38	38-40		#5 (100%)	Banded gneiss, 20 degree foliation	
40	40-50		#6 (100%)	Multiple large quartz veins, some staining of fractures 41.4-41.8 ft, 45.7 ft & 46.8 ft, no visible rock decomposition	
42					
44					
46					



Elevation (ft)
334
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298
296
294
292
290

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-10 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well Diagram	Elevation (ft)
48								288
50	50-55		#7 (94%)		Stained fractures 54-54.3 ft with slight decomposition Pyrite crystals visible, single fracture ~ 55.4 ft		Sand filter pack and pre-pack screen	286
52								284
54								282
56	55-60		#8 (80%)					280
58								278
60								276
62					Boring terminated at 60 feet in bedrock			274
64								272
66								270
68								268
70								266
72								264
74								262
76								260
78								258
80								256
82								254
84								252
86								250
88								248
90								246
92								244
94								242
96								240
98								238
100								236
102								234

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-11 BORING LOG

PROJECT NUMBER 6123211714
PROJECT NAME Plant Arkwright
CLIENT Georgia Power
ADDRESS 5001 Arkwright Road Macon, GA
LOCATION Ash Pond 1

DRILLING COMPANY Cascade Drilling
DRILLER J. Reinolds
RIG TYPE/ METHOD TSI CC150/ SONIC
CASING DIA. 2-in I.D. PVC
BORING DEPTH 70.0 ft

COORDINATES N 1062615.94, E 2440044.48
COORD SYS Ga State Plane West (NAD 83)
COMPLETION Stick-up w/ protective casing
SURFACE ELEVATION 335.78 ft NAVD 88
WELL TOC 338.98 ft NAVD 88

COMMENTS Start drilling 5/24/2021 and drilling completed 5/25/2021. Well construction completed on 5/27/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits
CHECKED BY J. Quinn

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS	Elevation (ft)
0	0-10		#1 (60%)	Hand auger to 3 ft Silty SAND with clays, coarse grained to fine gravel, brown/red, medium dense, moist	SM-SC	
2						334
4						332
6		6-7		Ash co-mingled with gravel, coarse sand to coarse gravel, black/red, very loose, dry, pieces of coal and evidence of rootlets 6.3 ft cobble, angular	ML	330
8		8-9		Silty SAND, medium grained, bright red, very dense, dry	SM	328
10	10-20		#2 (75%)	SAND, red, loose, dry, few fine to coarse angular gravel Clayey silty SAND co-mingled with trace ash, brown/black/red, loose, moist, rootlets	SW SM-SC	326
12				SAND, fine to medium grained, tan/light brown, very loose, dry	SP	324
14		12.5-13.5		SAND, medium to coarse grained, red/light brown, very loose, dry		322
16		16-17		Gravelly silty SAND with clays, red/black/white, loose, moist 16-17' angular quartzite gravel	SW-SC	320
18				Clayey silty SAND, brown/red, medium dense, moist	SM-SC	318
20	20-30		#3 (80%)	CLAY, brown/red, very soft, slight plasticity, wet	CL	316
22		22-23				314
24				Silty micaceous SAND, light brown/grey, medium dense, moist 33.6-34.1 ft clayey silty sand	SM	312
26						310
28		29-30				308
30	30-40		#4 (100%)		SM-SC	306
32						304
34		34-35				302
36						300
38				CLAY, red/brown/yellow/orange/grey, very stiff, low plasticity, moist, micaceous, saprolitic texture with silts	CL	298
40	40-50	39-40	#5 (100%)	Clayey silty SAND, red brown/light brown/grey/white, medium dense, moist	SM-SC	296
42				SAND, fine grained, red/brown, loose, moist CLAY with medium to coarse sands, tan/white, stiff, medium plasticity, moist	SP CL	294
44		44-45		42.4-42.9 ft coarse gravel seam, wet Silty SAND, fine to medium grained, black/white/red, medium dense, moist, saprolite texture (relic parent rock), heavily weathered rock, crumbles in hand 49-50 ft no rock fragments noted	SM	292
46						290

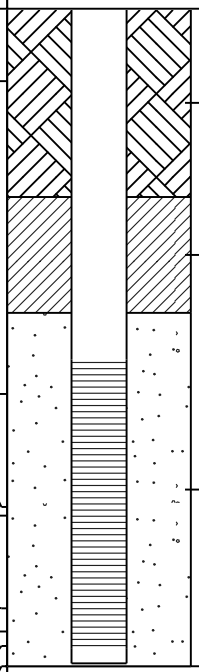
Well Diagram: Bentonite grout mix

Disclaimer This bore log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 14 Sep 2021

AP1PZ-11 BORING LOG

Depth (ft)	Samples	Geotech Sample	Sample Run (Recovery)	Material Description	USCS
48					
		49-50			
50	50-60		#6 (100%)	CLAY with coarse sand, brown, very stiff, low plasticity, moist, saprolitic	CL
52					
54		54-55			
56					
58					
		59-60			
60	60-65		#7 (100%)	CLAY, grey/white, very soft, medium plasticity, moist, fine to coarse white gravel	
62				CLAY and gravel, dark brown/white, stiff, high plasticity, moist, coarse sub-rounded gravel	CH
		63-64			
64				Gravelly SAND, coarse to fine grained, tan/brown/grey, very loose, wet	SW
66	65-70		#8 (100%)	Gravelly SAND, coarse to fine grained, little clays and silts, tan/brown, very loose, wet 65.9-66.4 ft very stiff sandy clay	SW-SC
		67-68			
68				Clayey silty SAND, brown, medium dense, stiff clay, moist	SM-SC
				Weathered rock lens, metamorphic rock texture	-
70				CLAY with sand and silt, green, very stiff, slight plasticity	CL-SC
				Boring terminated at 70 feet	



Elevation (ft)
288
286
284
282
280
278
276
274
272
270
268
266
264
262
260
258
256
254
252
250
248
246
244
242
240
238
236
234
232

produced by ESlog.ESdat.net on 14 Sep 2021

SURETY RIDER

To be attached to and form a part of

Bond No. 800031223

Type of Bond: Performance Bond for Water Well Contractors

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

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

and by Atlantic Specialty Insurance Company , as Surety,

in favor of State of Georgia
(OBLIGEE)

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

Coverage under the bond to include:
Michael Coleman

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

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

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

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

By: _____
(PRINCIPAL)

Atlantic Specialty Insurance Company

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

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 986 NEW YORK

S-0443/GE 8/08

XDP

OneBeacon
INSURANCE GROUP

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Deanna M. French, Jill A. Wallace, Susan B. Larson, Elizabeth R. Hahn, Jana M. Roy, Scott McGilvray, Mindee L. Rankin, Ronald J. Lange, John R. Claeys, Roger Kaltenbach, Guy Armfield, Scott Fisher**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **sixty million dollars ($60,000,000)** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

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

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

By _____
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this eighth day of December, 2014, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.

TARA JANELLE STAFFORD
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2020

_____
Notary Public

I, the undersigned, Assistant Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 21 day of December, 2017

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

This Power of Attorney expires
October 1, 2019

_____
James G. Jordan, Assistant Secretary

CONTINUATION
CERTIFICATE

Atlantic Specialty Insurance Company , Surety upon

a certain Bond No. 800033976

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

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

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

does hereby continue said bond in force for the further period

beginning on 06/30/2019
(MONTH-DAY-YEAR)

and ending on 06/30/2021
(MONTH-DAY-YEAR)

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

Description of bond Performance Bond for Water Well Contractors

Premium: $1200.00

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

Signed and dated on March 4th, 2019
(MONTH-DAY-YEAR)

Atlantic Specialty Insurance Company

By _____
Attorney-in-Fact Andrew P. Larsen

Parker, Smith & Feek, Inc.
Agent

2233 112th Ave NE Bellevue, WA 98004
Address of Agent

425-709-3600
Telephone Number of Agent

S-0157/GE 8/08

XDP

C. GROUNDWATER SAMPLING PROCEDURE

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.

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

1. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations and notify GPC if it appears that the well has been compromised.

2. Measure and record the depth to water in all wells to be sampled prior to purging using a water measuring device consisting of probe and measuring tape capable of measuring water levels with accuracy to 0.01 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 (or tubing if a peristaltic pump is used) 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 USEPA Region 4 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 ft. 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 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:
    - pH ±0.1 Standard Units (S.U.)
    - Specific Conductance ±5% (conductivity)
    - DO ±10 percent or ±0.2 milligrams per liter (mg/L) (whichever is greater) for DO

- where DO> 0.5 mg/L. If DO< 0.5 mg/L no stabilization criteria apply.
- Turbidity measurements ≤ 5 nephelometric turbidity units (NTUs) or between 5 and 10 NTUs after 3 hours of purging.
- Temperature – Record only, not used for stabilization criteria
- ORP – Record only, not used for stabilization criteria.

7. Collect samples at a low flow rate according to the most current version of USEPA Region 4 SESD guidance document, Operating Procedure – Groundwater Sampling (EPA, SESDPROC-301-R#), 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 donned prior to filling sample bottles. Gloves will be discarded after sampling each well and before sampling the next well.

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

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

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

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

A brief overview of purging and sampling methodologies, including the type of sampling equipment used will be provided in routine monitoring reports.