

Environmental Affairs BIN 10221 241 Ralph McGill Boulevard NE Atlanta, GA 30308-3374

October 20, 2023

Ms. Beverly Tipton Solid Waste Management Program Environmental Protection Division 4244 International Parkway, Suite 104 Atlanta, Georgia 30354

Subject: Georgia Power – Plant Hammond Ash Pond 4 (AP-4) Permit No. 057-025D(CCR) Request for Minor Modification to Update Groundwater Monitoring Network GEOS Submittal ID 793085

Dear Ms. Tipton:

This request for minor modification at Plant Hammond AP-4 is being submitted to update the groundwater monitoring network to reflect as built conditions of the abandonment of HGWC-117. The minor modification request for the replacement and abandonment of this well was submitted under GEOS ID 749682 and approved in a letter from EPD dated July 27, 2023. The well was abandoned in accordance with the previously submitted site Groundwater Monitoring Plan and a well abandonment report was submitted to EPD under GEOS ID 775852.

If you have any questions about this submittal, please contact Noelia Gangi at 404-852-4068.

Sincerely,

Launderty

Lauren Petty, P.G Supervisor, Environmental Affairs Georgia Power Company

Attachments:

ATTACHMENT 1: PERMIT CLOSURE DRAWINGS (COMPLIANCE MONITORING NETWORK AND ENVIRONMENTAL MONITORING PLAN) ATTACHMENT 2: PLANT HAMMOND ASH POND 4 GROUNDWATER MONITORING PLAN (REVISION 1)

ATTACHMENT 1

PERMIT CLOSURE DRAWINGS (COMPLIANCE MONITORING NETWORK AND ENVIRONMENTAL MONITORING PLAN)



TABLE OF PROJECT BASELINE COORDINATES										
UMBER	BEGIN STATION	NORTHING	EASTING	LENGTH	BEARING	END STATION	NORTHING	EASTING		
L1	10+00.00	1,548,399.91	1,934,257.13	3100.00'	N90 ° 00'00"E	41+00.00	1,548,399.91	1,937,357.13		

0		
	EXISTING INTER	RMEDI
	EDGE OF WATE	ER
	FLOOD HAZAR) LII j
	APPROXIMATE	LAN
	GRAVEL ROAD	
	TREE LINE	
	FENCE	T
E ———	OVERHEAD EL	CTR
5	POWER POLE	
	PERMIT BOUND	ARY
	PROPERTY BO	JNDA
	STREAM BUFF	R
—0—	GUARDRAIL	A
	LIMITS OF CCF	
7	MONITORING W	ELL



ATTACHMENT 2

PLANT HAMMOND ASH POND 4 GROUNDWATER MONITORING PLAN (REVISION 1)

GROUNDWATER MONITORING PLAN

PLANT HAMMOND – ASH POND 4 (AP-4) FLOYD COUNTY, GEORGIA

FOR





SEPTEMBER 2020 REVISION 1 – OCTOBER 2023





Geosyntec Consultants, 1255 Roberts Boulevard, Suite 200, Kennesaw, Georgia 30144 Phone: 678-202-9500, Fax: 678-202-9501

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C. GROUNDWATER SAMPLING PROCEDURE

I. CERTIFICATION

This Groundwater Monitoring Plan, Georgia Power Company - Plant Hammond Ash Pond 4 (AP-4) has been prepared by a qualified groundwater scientist or engineer with Geosyntec Consultants, Inc. (Geosyntec) to meet the requirements contained in Chapter 391-3-4-.10 of the Georgia Environmental Protection Division Rules of Georgia, Solid Waste Management, Coal Combustion Residuals (i.e., State CCR Rule). References to the appropriate sections of the State CCR Rule are incorporated throughout this document.

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

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Signature: Date:	October 4, 2023	* No. <u>PE036641</u> * No. <u>PE036641</u> PROFESSIONAL *
Signature: Date:	October 4, 2023	HILD PROFESSION
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Ap	pproved By:	- 1

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 Ash Pond 4 (AP-4 or Site) at Georgia Power Company's (Georgia Power's) Plant Hammond. This plan meets the requirements of EPD rules and uses EPD's Manual for Ground Water Monitoring dated September 1991 as a guide. Groundwater monitoring well locations are presented on **Figure A-1** of **Appendix A** and well construction details in **Table A-1** of **Appendix A**.

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

In accordance with the Georgia State CCR Rule 391-3-4.10, a detection monitoring well network for AP-4 has been installed and certified by a qualified groundwater scientist. The existing monitoring wells were installed following the guidelines presented herein. Additionally, this plan documents the methods for future monitoring well installation and/or replacement, and procedures for well abandonment. As required by 391-3-4.10(6)(g), a minor modification will be submitted to the EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

The following section presents the geologic and hydrogeologic conditions for the Site as described in the *"Hydrogeologic Assessment Report (Revision 1)"* (HAR) (Geosyntec, 2020) tab in Section 2 of Part B of this permit application.

2.1 SITE GEOLOGY

AP-4 is located within the Great Valley and Ridge Physiographic Province (Valley and Ridge) in northwest Georgia, which is characterized by Paleozoic sedimentary rocks that have been folded and faulted into the ridges and valleys that gave this region its name. Geologic mapping performed at the Site by Petrologic Solutions, Inc. (Golder, 2018) indicates that the Site is underlain by the lower units of the Cambrian age Conasauga Formation, consisting of mostly calcareous shale. Based on review of subsurface investigations at the Site, the bedrock was described as predominantly shale. AP-4 is underlain primarily by five lithologic units: (i) terrace alluvium, (ii) colluvium, (iii) residuum, (iv) partially weathered shale bedrock, and (v) unweathered shale bedrock.

Based on subsurface investigations, the alluvial deposits generally grade from a silt and silty clay to a clayey sand and silty sand to a sand and gravelly sand at depth. The colluvium consists of silty sand, silty clay with the presence of angular fragments of rocks/materials not expected in the lower units of the Conasauga, such as chert, sandstone, limestone, or coal. Residual or native soils have been derived from the in-place weathering of the shale bedrock. The residuum is generally described as brown to yellow brown firm clayey silt with weathered shale fragments. The partially weathered shale zone occurs as an intermediate weathering stage between the residuum and the unweathered shale bedrock. The weathered material is described as black to dark gray to dark red hard, fissile shale and claystone. The unweathered shale bedrock was not encountered or directly observed in the historical borings advanced at the Site, until 2020 when well HGWA-48D was installed upgradient of the unit and screened in bedrock. Based on geologic conditions in the region, weathering, fracturing and jointing decreases with depth and the weathered rock material grades into competent bedrock.

2.2 SITE HYDROGEOLOGY

The uppermost aquifer at AP-4 is a regional groundwater aquifer that occurs primarily in the residuum, but also to some degree within the weathered and fractured bedrock. Under natural conditions the water table surface would be expected to be a subdued reflection of the topography. Groundwater recharge is by precipitation falling onto bedrock outcrop areas and then percolating through alluvial, colluvial, and residual soils to the bedrock. Based on observations of residuum soil types and horizontal conductivity values, the movement of groundwater in the soil can be characterized as low-to moderate permeability, porous media flow. The groundwater flow in the shallow underlying bedrock is characterized as fracture flow, and due to the preponderance of shale beneath the Site, is expected to be very low permeability. Groundwater flow direction is generally from north to south as shown on the potentiometric surface map, **Figure A-2** in **Appendix A**. The potentiometric surface map represents data recorded in August 2022.

Aquifer testing was conducted by Southern Company Services (SCS) in 2013 to evaluate hydraulic conditions in the vicinity of AP-4. Results of these field events are discussed in detail in the HAR. The representative groundwater hydraulic gradient for AP-4, based on the August 2022 water level data, is 0.015 feet/foot (ft/ft), averaged from hydraulic gradients calculated along the eastern, central, and

western portions of the unit. The well pairs correlating to these flow areas are, respectively: GWA-14 and HGWC-118; HGWA-113 and HGWC-102; HGWA-111 and HGWC-107. Horizontal hydraulic conductivity (K_h) was estimated for units above the top of bedrock by performing rising head tests (slug out) and falling head tests (slug in). The tests were conducted at wells screened in the terrace alluvium or colluvial material, and averages for alluvium and for colluvium were calculated. Undisturbed soil samples of the alluvial material were collected for the purpose of hydraulic conductivity testing, representing vertical hydraulic conductivity (K_v). Very little residuum was encountered beneath either the alluvial or colluvial sediments at the Site. The majority of the wells are screened in either alluvial or alluvial/colluvial materials; therefore, no hydraulic conductivity testing was conducted on the residuum, weathered shale, or unweathered shale.

The K_h measured in wells screened in the alluvial, colluvium, residuum, and/or weathered shale material ranged from 1.0×10^{-4} to 4.7×10^{-3} centimeters per second (cm/s), with a geometric mean of 6.0×10^{-4} cm/s. The geometric mean for K_v, as calculated from conducting permeability tests on undisturbed soil samples, was 3.1×10^{-5} cm/s (Geosyntec, 2020), presented in Table A-1 of **Appendix A**.

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells were installed to monitor the uppermost occurrence of groundwater beneath the Site. Locations were selected based on the AP-4 footprint and geologic and hydrogeologic considerations. Georgia Power follows the recommendation as stated in Chapter 2 of the *Manual for Groundwater Monitoring* (1991) to establish well spacings based on site-specific conditions. The monitoring well network for AP-4 is depicted on Figure A-1 included in **Appendix A**, Monitoring System Details. A more detailed discussion of the hydrogeological investigation conducted in support of monitoring well placement is provided in the HAR.

The groundwater detection monitoring well (formerly known as "compliance monitoring well") network locations were chosen to monitor upgradient (HGWA), and downgradient (HGWC) conditions at the Site based on groundwater flow direction determined by potentiometric evaluation. The potentiometric surface map, Figure A-2 in Appendix A, depicts the groundwater flow direction beneath AP-4, based on August 2022 conditions. Five wells (i.e., HGWA-111, HGWA-112, HGWA-113, HGWA-47, and HGWA-48D) are designated for monitoring of upgradient conditions and eight wells (i.e., HGWC-101, HGWC-102, HGWC-103, HGWC-105, HGWC-107, HGWC-109, HGWC-117A, and HGWC-118) are designated for monitoring of downgradient conditions. The detection monitoring well network is supplemented by three piezometers upgradient and five piezometers downgradient of AP-4, installed to provide additional data to characterize flow conditions and groundwater quality in vicinity of AP-4. Wells are positioned to provide adequate coverage to detect potential impacts from the CCR impoundment. Both upgradient and downgradient wells are screened in the uppermost aquifer, in the alluvium, colluvium, residuum, and/or partial weathered shale above the competent shale bedrock, except for HGWA-48D which was installed within bedrock to characterize background conditions at a deeper interval upgradient of the unit. Recorded groundwater level data indicate that HGWA-48D is hydraulically connected with the surficial aquifer.

Monitoring wells are generally located outside of areas with frequent auto traffic (Figure A-1); however, wells may be installed in heavily trafficked areas when necessary to meet the groundwater monitoring objectives of the EPD rules. **Appendix A** includes Table A-1 which provides a tabulated list of location coordinates for the individual wells and piezometers. Additional well and piezometer construction details (i.e., top-of-casing elevation, well depths and screened intervals) are also provided on this table. Well survey data certified by a Georgia-registered professional surveyor are included in **Appendix A**.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT AND REPORTING

The AP-4 monitoring well network described in this plan is already in place. The existing monitoring wells were installed following USEPA Region 4 Laboratory Services and Applied Science Division (LSASD) *Operating Procedure for Design and Installation of Monitoring Wells* (SESDGUID-101-R#) (USEPA, 2008, 2013, 2018) as a general guide for best practices. Boring and well construction logs are provided in **Appendix A** for all wells and piezometers listed in Table A-1. Additional monitoring wells, if necessary, will be installed in accordance with the following procedures.

4.1 DRILLING

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

Sampling and/or coring may be used to help determine the stratigraphy and geology at the well location. Samples and cores will be logged by a qualified groundwater scientist. Screen depths will be chosen based on the target installation depth.

All drilling for any subsurface hydrologic investigation, or for installation or abandonment of groundwater monitoring wells, will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. **Appendix A** includes the performance bonds applicable to the wells and piezometers listed in Table A-1.

4.2 DESIGN AND CONSTRUCTION

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

WELL CASINGS AND SCREENS

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

WELL INTAKE DESIGN

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

Each groundwater monitoring well will include a well screen designed to limit the amount of formation material passing into the well when it is purged and sampled. Screens with 0.010-inch slots have proven effective for the earth materials at the Site and will be used unless geologic conditions discovered at the time of installation dictate a different size. Screen length will not exceed 10 feet without justification as to why a 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 approximately one to two feet above the top of the well screen.

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

The 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 extending outward with a radius of at least 2 feet from the edge of the well casing and sloped to drain water away from the well.

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

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

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

WELL DEVELOPMENT

Well development will be conducted under supervision 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 minimum 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 a well's filter pack over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, monitoring wells may need to be redeveloped periodically to remove the silt and clay that has worked its way into the filter packs of the wells. Each monitoring well should be redeveloped when sample turbidity values have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above. Well development data will be included in the well installation report.

4.3 ABANDONMENT

Per Georgia Rule 391-3-4-.10(6)(g), monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the EPD. Monitoring wells will be abandoned using industry-accepted practices and using the EPD Manual for Groundwater Monitoring (1991) and Georgia's Well Water Standards Act of 1985 [Official Code of Georgia Annotated (O.C.G.A.) § 12-5-120, 1985] as guides. The wells will be abandoned under the direction of a professional geologist (P.G.) or engineer (P.E.) registered in Georgia. 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 AP-4 will be over-drilled prior to abandonment.

4.4 DOCUMENTATION

Within 60 days of the construction, survey, development, or abandonment of each new groundwater monitoring well completed under the direction of a qualified groundwater scientist or engineer, a well installation/abandonment report will be submitted to the EPD. The following information will be documented in this 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
- Narrative of drilling technique applied, well construction details, and well development procedures, including dates, drilling fluids used (if applicable), well casing and screen materials, screen slot size, and joint type
- Details of filter pack material/size, emplacement method (narrative), and volume
- Seal emplacement method and type/volume of sealant
- Borehole diameter and well casing diameter
- Type of protective well cap and sump dimensions
- Surface seal and volumes/mix of annular seal material
- Screen length and interval reported in feet below ground surface and elevation
- Well location data given to within an accuracy of 0.5 feet based on survey data recorded from an acceptable survey point datum by a Georgia-registered professional surveyor
- Well elevation data given to within an accuracy of 0.01 feet based on survey data recorded from an acceptable survey point datum by a Georgia-registered professional surveyor
- Lithologic logs
- Documentation that water quality field parameters meet well development criteria (Section 4.2)
- Completed calibration field forms for the water quality instrumentation used during well development activities
- Documentation of ground surface elevation (±0.01 feet)
- Documentation of top of casing elevation (±0.01 feet)
- Schematic of the well with dimensions for all components (e.g., casing, screen, sump, well pad)

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 1, Groundwater Monitoring Parameters and Frequency, presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from existing detection monitoring wells were collected between August 2016 and October 2018 and analyzed for 40 CFR § 257, Subpart D, Appendix III and Appendix IV parameters to establish a background statistical dataset. Exception to this is well HGWC-102, which was reclassified as a detection monitoring well in 2019, and wells HGWA-47 and HGWA-48D which were installed in 2020 and HGWC-117A installed in 2021. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semi-annual during closure activities and the post-CCR removal monitoring period. Pursuant to Chapter 391-3-4-.10(6), an assessment monitoring program was initiated for AP-4 in August 2019 based on statistically significant increases documented in the *2019 Annual Groundwater Monitoring and Corrective Action Report* (Geosyntec, 2019). Georgia Power will conduct assessment monitoring in accordance with Chapter 391-3-4-.10(6).

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

TABLE 1
GROUNDWATER MONITORING PARAMETERS & FREQUENCY

MONUT		GROUNDWATER MONITORING							
NONT		Background	Semi-Annual Events						
	Temperature	х	Х						
	рН	х	Х						
Field Deve we at a ve	ORP	х	Х						
Field Parameters	Turbidity	х	Х						
	Specific Conductance	х	Х						
	Dissolved Oxygen	х	Х						
	Boron	х	Х						
	Calcium	х	Х						
	Chloride	х	Х						
Appendix III (Detection)	Fluoride	х	Х						
Detection	рН	х	Х						
	Sulfate	х	Х						
	Total Dissolved Solids	х	Х						
	Antimony	х							
	Arsenic	х							
	Barium	х							
	Beryllium	Х							
	Cadmium	Х							
	Chromium	Х							
• Ľ 11/	Cobalt	Х	Assessment sampling frequency						
Appendix IV (Assessment)	Fluoride	Х	and parameter list determined in accordance with Georgia Chapter						
(Lead	Х	391-3-4.10(6).						
	Lithium	Х							
	Mercury	Х							
	Molybdenum	Х							
	Selenium	х							
	Thallium	x							
	Radium 226 & 228	x							

TABLE 2 ANALYTICAL METHODS

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

6. **SAMPLE COLLECTION**

During each sampling event, samples will be collected and handled in accordance with the procedures specified in **Appendix C**, Groundwater Sampling Procedure. Sampling procedures were developed using standard industry practice and USEPA Region 4 *Field Branches Quality System and Technical Procedures* as a guide. Low-flow sampling methodology will be utilized for sample collection. Alternative USEPA accepted sampling techniques may be used when appropriate. The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to the EPD.

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

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

7. CHAIN-OF-CUSTODY

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

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

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

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

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

8. FIELD QUALITY ASSURANCE / QUALITY CONTROL

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

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

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

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

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. Completed calibration field forms will be provided with the semi-annual groundwater monitoring reports.

9. **REPORTING RESULTS**

A semi-annual groundwater report that documents the results of sampling and analysis will be submitted to the EPD. 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, the dates the samples were collected, and whether the samples were required by the detection or assessment monitoring programs.
- 2. A narrative of purging/sampling methodologies, which will include the type of sampling equipment used.
- 3. Discussion of results.
- 4. Recommendations for the future monitoring consistent with the Rules.
- 5. Potentiometric surface contour map for the aquifer(s) being monitored, signed and sealed by a Georgia-registered P.G. or P.E.
- 6. Table of as-built information for groundwater monitoring wells including top of casing elevations, ground elevations, screened elevations, current groundwater elevations and depth to water measurements.
- 7. Groundwater flow rate and direction calculations.
- 8. Identification of any groundwater wells that were installed or abandoned during the preceding year, along with a narrative description of why these actions were taken.
- 9. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
- 10. If applicable, semi-annual assessment monitoring results.
- 11. Any alternate source demonstration completed during the previous monitoring period, if applicable.
- 12. Laboratory Reports and associated data validation reports.
- 13. COC documentation.
- 14. Field sampling logs including field instrument calibration, indicator parameters and parameter stabilization data.

- 15. Field logs and forms will be kept for each sampling event, and will include the following, but not be limited to, well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling.
- 16. Documentation of non-functioning wells.
- 17. Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL).
- 18. Statistical analyses.
- 19. Certification by a qualified groundwater scientist.
- 20. An iso-concentration map of each Appendix IV constituent identified at a statistically significant level (SSL) during the reporting period. The concentrations will be contoured to the current applicable groundwater protection standard. Inclusion of the map(s) is only applicable for a unit currently undergoing assessment of corrective measures and/or corrective action
- 21. Trend charts
- 22. Updated potable water well survey, annually (if applicable based on exceedance of groundwater protection standards)

10. STATISTICAL ANALYSIS

Groundwater quality data from each sampling event will be statistically evaluated to determine if there has been a statistically significant change in groundwater chemistry. Historical background data will be used to establish statistical limits. Statistical analysis techniques will be consistent with the USEPA document *Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance* (Unified Guidance) (USEPA, 2009).

According to GA 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 will be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that will be used include:

- 1. A prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each detection monitoring well is compared to the upper tolerance or prediction limit. [§257.93(f)(3)];
- 2. A control chart approach that gives control limits for each constituent. [§257.93(f)(4)]; and
- 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 downgrardient 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*, presents a flowchart that depicts the process that will be followed to develop the site-specific plan.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW



11. **REFERENCES**

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- Georgia Rules and Regulations, 2018. *Rule Subject 391-3-4, Solid Waste Management*. Revised March 28, 2018.
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United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2018. *Operating Procedure for Design and Installation of Monitoring Wells*. SESDGUID-101-R2.

APPENDIX

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

A. MONITORING SYSTEM DETAILS

- FIGURE A-1 GROUNDWATER MONITORING NETWORK MAP
- FIGURE A-2 POTENTIOMETRIC SURFACE CONTOUR MAP AUGUST 2022
- TABLE A-1 AP-4 WELL AND PIEZOMETER NETWORK DETAILS

BORING AND WELL CONSTRUCTION LOGS

CERTIFIED WELL NETWORK SURVEY DATA

PERFORMANCE BOND FOR DRILLERS





LEGEND

- Detection Monitoring Well
- Piezometer
- Unnamed Creek
- Approximate AP-4 Boundary
- Plant Hammond Property Boundary



Notes:

1. Aerial photograph source: Google Earth Pro, August 2019 and Georgia Power Company, August 2022.



GEORGIA POWER PLANT HAMMOND FLOYD COUNTY, GEORGIA







Table A-1 AP-4 Well and Piezometer Network Details Plant Hammond, Floyd County, Georgia

Well ID	Installation Date	Northing ⁽¹⁾	Easting ⁽¹⁾	Ground Surface Elevation ⁽²⁾ (ft)	Top of Casing Elevation (ft)	Top of Screen Elevation (ft)	Bottom of Screen Elevation (ft)	Well Depth ⁽³⁾ (ft BTOC)	Mean Kh, (cm/sec)	Mean Kv, (cm/sec)	Screened Media	
Detection Monitoring Well		1	1									
HGWA-111	8/21/2012	1548834.26	1935222.81	588.79	591.75	558.48	548.48	43.67			Alluvium, Residuum	
HGWA-112	8/21/2012	1548885.63	1935647.00	593.46	596.27	566.52	556.52	40.15	1.04E-04		Alluvium	
HGWA-113	10/2/2012	1548944.62	1935990.09	592.07	594.58	568.87	558.87	36.11			Alluvium	
HGWA-47	8/21/2020	1548990.96	1934171.84	577.39	580.33	546.84	536.84	43.74			Partially weathered rock	
HGWA-48D	8/20/2020	1548989.39	1934178.15	577.29	580.26	517.54	507.54	72.97			Shale	
HGWC-101	8/7/2012	1547725.50	1936369.58	575.91	578.85	551.31	541.31	37.94			Alluvium	
HGWC-102	8/7/2012	1547713.50	1936033.33	574.54	577.54	550.51	540.51	37.43			Alluvium	
HGWC-103	8/8/2012	1547848.88	1935732.96	577.76	580.79	553.51	543.51	37.68			Alluvium	
HGWC-105	8/8/2012	1547855.56	1935110.36	579.08	582.09	547.72	537.72	44.67		3.10E-05	Alluvium, Residuum	
HGWC-107	8/8/2012	1547909.99	1934442.24	576.43	579.31	551.51	541.51	38.20			Alluvium	
HGWC-109	8/15/2012	1548627.41	1934362.77	573.66	576.77	555.81	545.81	31.36			Alluvium	
HGWC-117A	7/21/2021	1548082.04	1937157.25	578.85	581.76	551.85	541.85	37.40			Alluvium	
HGWC-118	10/1/2012	1547980.56	1936946.37	576.52	579.02	548.51	538.51	40.91			Alluvium, Residuum	
Piezometer	-											
MW-12	10/21/2014	1547853.78	1937525.46	580.59	583.27	555.84	545.84	37.83			Alluvium, Silty sand, Well- graded sand	
GWC-4	8/8/2012	1547898.31	1935398.70	577.73	580.65	543.47	533.47	47.58	4.65E-03		Sand, Weathered shale	
GWC-6	8/13/2012	1547843.93	1934800.45	578.55	581.63	553.90	543.90	38.13			Alluvium, Silty, fine sand, Sand	
GWC-8	8/9/2012	1548167.13	1934342.94	577.13	579.99	549.47	539.47	40.92	3.28E-04	3.10E-05	Alluvium, Clayey sand, Sand	
GWA-14	10/2/2012	1548982.59	1936642.58	589.70	592.14	561.40	551.40	41.14			Alluvium	
GWA-15	8/22/2012	1548766.17	1936808.47	588.37	591.56	571.44	561.44	30.52	3.79E-04		Alluvium	
GWA-16	8/21/2012	1548592.74	1937210.99	579.58	582.55	569.94	559.94	23.01			Alluvium	
GWC-19	8/14/2012	1547892.89	1936572.97	576.90	579.83	554.04	544.04	36.19			Sand and gravel	

Notes:

-- = not available cm/sec = centimeters per second

 $\mathbf{ft} = \mathbf{feet}$

ft BTOC = feet below top of casing Kh = Horizontal Hydraulic Conductivity

Kv = Vertical Hydraulic conductivity (1) Coordinates in North American Datum (NAD) 1983, State Plane, Georgia-West, feet.

(2) Elevations are referenced to the North American Vertical Datum (NAVD) 1988.(3) Total well depth accounts for sump if data provided on well construction logs.



BORING AND WELL CONSTRUCTION LOGS





BORING NO.: HGWA-111

PR	PROJECT: Plant Hammond Ash Pond #4 Well Installation								JOB NO: 1811-12-153 SHEET 1 OF 1										
PR	OJECT	LOCAT	ON:	Rome, Georgia															
ELE	EVATIC	N: 588.	79 fe	eet	вс	DRING STAR	TED		8/2	0/20)12		RIG TYPE:CME-5	50	AUGE	ER DIA. (II	N): 6.75		
DR	ILLING	METHO	D: H	ollow-Stem Augers	в	30RING COMPLETED: 8/20/2012 HAMMER: Automatic													
GROUNDWATER: Variable 30 feet ATD T.3 feet on 8/21/12						Remarks: Monitoring well set at 40.4 feet below ground surface Elevation in NAVD 88.													
G	ELEV (FT.)	.DEPTH (FT.)		MATERIAL DESC	RIPT	ION		L	S	R	м	PI	STANDARD P RESISTA 0 10 20	ENETR ANCE (1 30 40	ATION N) 50 60 70	BLC 80 90100	BLOWS/6"		
Ţ	578.5 - 574.5 - 569.5 -		10' 14' 19'	CLAYEY SILT (ML) with subrounded chert pebble shale fragments, brown, CLAYEY SILT/SILTY CL with scattered round pet fine sand, yellow-brown oxidation staining, damp CLAYEY SILT (ML) with sand, yellow-brown, ora with black oxidaiton stain very stiff SANDY CLAYEY SILT (mica, weathered light gr yellow-brown dolomite fr yellow-brown with zones blue-gray clayey sand, c stiff to very stiff	_AY bble with o, sti a trac nge ML) ay a ragn	(CH-MH), s and trace black iff , and gray g, damp,) with trace and nents, light p to moist,							9 9 13 13 13 13	23		5 - 9 3 - 2 6 - 7 5 - 6 6 - 9	- 4 (13) - 7 (9) - 10 (17) - 7 (13) - 14 (23)		
	558.5	- 30	30'	SILTY CLAY (CH), with dolomite and claystone t yellow-brown and orang soft and hard	darl frag e, w	k gray ments, vet, stiff,	RESIDUUM			-			•4			4 - 7 6 - 2 >> • 50/2	- 7 (14) - 2 (4) (50+)		
	548.0	- 40		Boring terminated at 40).5 fe	eet					1	<u> </u>							

Project Manager: J. Heywood, PE

GEORGIA POWER PLANT HAMMOND ASH POND #4 ROME, GEORGIA



WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY			WELL ID:
DRILLED BY: Chad Odom (S&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: CME-550	DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	
DATE CONSTRUCTED: August 21, 2012			
		DEPTH	ELEVATION
		FEET	FEET
Locking Hinged Top			
	TOP OF RISER	3.27	591.75
1/4-inch Vent	Cap Type: Plastic Locking		
1/4-inch Weep Hole	ΤΟΡ ΟΕ ΝΑΙΙ	0.31	588.79
		0.51	F00.40
4-ft x 4-ft concrete pad	GROUND SURFACE	0.0	588.48
	* PROTECTIVE CASING		
	TTPE. STAINLESS STEEL LOCKING		
	BOTTOM OF PROTECTIVE CASING	-1 25	587.23
		1.20	
	BACKFILL MATERIAL		
Water Level @	TYPE: Portland Cement Grout		
time of completion:	AMOUNT: 50 gallons		
	RISER CASING		
	DIA: 2-inch		
Delayed water level -7.3 feet	TYPE: Schedule 40 PVC		
Date and time: 8/21/12	JOINT TYPE: Flush Threaded		
	ΤΟΡ ΟΕ SEΔΙ	-23 5	564.98
	ANNULAR SEAL	23.5	
	TYPE: 3/8-inch coated bentonite pellets		
	5-gal buckets		
	AMOUNT: 50 lbs		
	PLACEMENT: 4.4 feet		
	TOP OF FILTER PACK	-27.9	560.58
	FILTER PACK		
	TYPE: DSI Sand - 1A (20/30)		
	Drillers Services, Inc.		
	AMOUNT: 4.5 Dags		
	PEACEMENT. 12.5 leet		
	BOTTOM OF RISER/TOP OF SCREEN	-30.0	558.48
	SCREEN (10.0')	0010	
	DIA: 2-inch		
	TYPE: Schedule 40 PVC Prepack		
	OPENING WIDTH: 0.01-inch		
	OPENING TYPE: Slotted		
	SLOT SPACING: 0.25-inch		
	SLOT LENGTH: 1.5-inch	40.0	F 40 40
Fluch threaded and can	BOTTOM OF SCREEN	-40.0	548.48
		-40.4	510 00
		40.4	340.00
HOLE DIA:	6.75"		

Elevation in NAVD 88.


PROJECT LOCATION: Rome, Georgia ELEVATION: \$93.46 feet BORING STARTED: 8/21/2012 Rig TYPE:CME-550 AUGER DIA DRILING METHOD: Hollow-Stem Augers BORING COMPLETED: 8/21/2012 HAMMER: Automatic GROUNDWATER: Remarks: Monitoring well set at 37.0 feet below ground surface Elevation in NAVD 88. G ELEV DEPTH (FT.) MATERIAL DESCRIPTION L S R M PI STANDARD PENETRATION RESISTANCE (N) e B 593.1 0 0.5 TOPSOIL, dark brown, grass, roots dragments, yellow-brown, orange, gray, dragments, yellow-brown, orange, gray, e F F G STANDARD PENETRATION RESISTANCE (N) e B 587.1 - - 0.5 - CLAYEY SILT:SILTY CLAY (CL-ML) F 588.6 25 - - - - - - - 588.6 25 - - - - - - - - - - 588.6 25 - - - - - - - - - - 588.6 - - - -	NO: 1811-12-153 SHEET 1 OF 1	JOB NC		nond Ash Pond #4 Well Installation	lammond Ash Por	ant Ha	CT: P	PROJ		
ELEVATION: 593.46 feet BORING STARTED: 8/21/2012 RIG TYPE:CME-550 AUGER DIA. DRILLING METHOD: Hollow-Stem Augers BORING COMPLETED: 8/21/2012 HAMMER: Automatic GROUNDWATER:				Rome, Georgia	ON: Rome, Georgi	CATIO	CT LC	PROJ		
DRILLING METHOD: Hollow-Stem Augers BORING COMPLETED: 8/21/2012 HAMMER: Automatic GROUNDWATER:	RIG TYPE:CME-550 AUGER DIA. (IN): 6.7	2012	TED: 8/21/	et BORING STAR	16 feet	593.46	TION:	ELEV		
GROUNDWATER: 16 feet ATD Remarks: Monitoring well set at 37.0 feet below ground surface Elevation in NAVD 88. GROUNDWATER: GS LEV DEPTH (FT.) MATERIAL DESCRIPTION L S R M PINETRATION RESISTANCE (N) GS CLAYEY SILT-SILTY CLAY (CL-ML) PINETRATION RESISTANCE (N) 583.1 O O.5 TOPSOIL, dark brown, grass, roots PINETRATION RESISTANCE (N) 583.1 O O.5 TOPSOIL, dark brown, grass, roots PINETRATION RESISTANCE (N) 583.1 O O.5 TOPSOIL, dark brown, grass, roots PINETRATION RESISTANCE (N) 583.1 O O.5 TOPSOIL, dark brown, grass, roots PINETRATION RESISTANCE (N) 583.1 O O.5 CLAYEY SILT/SANDY SILT (ML) with trace mica, and scattered chert tragments, yellow-brown, orange, light blue-gray, dry to wet, very stiff to stiff 588.6 25 24.5 SANDY CLAY (CL) with trace mica, brown and light blue gray, moist to wet, firm	HAMMER: Automatic	2012	bllow-Stem Augers BORING COM	D: Hollow-Stem Au	THOD:	NG ME	DRILL			
G ELEV.DEPTH (FT.) MATERIAL DESCRIPTION L S R M PI STANDARD PENETRATION RESISTANCE (N) E 593.1 0 0.5' TOPSOIL, dark brown, grass, roots CLAYEY SILT/SILTY CLAY (CL-ML) with dolomite, chert, shale, and coal fragments, yellow-brown, orange, gray, damp to moist, firm # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #	at 37.0 feet below ground surface	ell set at 3	Monitoring we	Remarks:	GROUNDWATER:					
593.1 0 0.5 TOPSOIL, dark brown, grass, roots / CLAYEY SILT-SILTY CLAY (CL-ML) with dolomite, chert, shale, and coal fragments, yellow-brown, orange, gray, damp to moist, firm 5 6 SILTY CLAY (CH) with scattered subrounded chert fragments, orange-brown, moist, firm 7 578.6 15 14.5 CLAYEY SILT/SANDY SILT (ML) with trace mica and scattered chert fragments, yellow-brown, orange, light blue-gray, dry to wet, very stiff to stiff 7 578.6 25 24.5 SANDY CLAY (CL) with trace mica, brown and light blue gray, moist to wet, firm to soft 7 568.4 35 34.7 CLAYEY FINE SAND (SC) with trace mica, brown and light blue gray, moist to wet, firm to soft 7	PI STANDARD PENETRATION RESISTANCE (N) BLOWS/6" 0 10 20 30 40 50 60 70 80 90100	R M PI	LSF	MATERIAL DESCRIPTION	MAT	PTH T.)	EV.DI T.) (зĘ		
578.6 15 14.5 CLAYEY SILT/SANDY SILT (ML) with trace mica and scattered chert fragments, yellow-brown, orange, light blue-gray, dry to wet, very stiff to stiff 568.6 25 24.5 SANDY CLAY (CL) with trace mica, brown and light blue gray, moist to wet, firm to soft 30 558.4 35 34.7 CLAYEY FINE SAND (SC) with trace mica and scattered subround pebble, gray and orange, wet, firm	•6 •6 •8 ••8 ••••••••••••••••••••••••••		FILL ALLUVIUM	TOPSOIL, dark brown, grass, roots CLAYEY SILT-SILTY CLAY (CL-ML) with dolomite, chert, shale, and coal fragments, yellow-brown, orange, gray, damp to moist, firm SILTY CLAY (CH) with scattered subrounded chert fragments, orange-brown, moist, firm	6" TOPSOIL, CLAYEY S with dolomi fragments, damp to me SILTY CLA subrounder orange-bro	0 -0 5 10 	3.1 - - - - - - - - - - - - - - - - - - -	5		
568.6 25 24.5 SANDY CLAY (CL) with trace mica, brown and light blue gray, moist to wet, firm to soft 4 4 4 4 4 3 558.4 35 34.7 CLAYEY FINE SAND (SC) with trace mica and scattered subround pebble, gray and orange, wet, firm 4 4 4 3	9 - 12 - 17 (29) 9 - 12 - 17 (29) 5 - 5 - 6 (11)			CLAYEY SILT/SANDY SILT (ML) with trace mica and scattered chert fragments, yellow-brown, orange, light blue-gray, dry to wet, very stiff to stiff	14.5		3.6	- - 5		
558.4 35 34.7 CLAYEY FINE SAND (SC) with trace mica and scattered subround pebble, gray and orange, wet, firm	•4 3 - 2 - 2 (4)			SANDY CLAY (CL) with trace mica, brown and light blue gray, moist to wet, firm to soft	SANDY CL SANDY CL brown and firm to soft	25 — 24 30 —	3.6	5		
Boring terminated at 37 feet	•13 3 - 5 - 8 (13)			CLAYEY FINE SAND (SC) with trace mica and scattered subround pebble, gray and orange, wet, firm Boring terminated at 37 feet	34.7 CLAYEY F mica and s gray and or <i>Boring terr</i>	40	8.4 	5		



WELL CONSTRUCTION LOG

CLIENT:	SOUTHERN CO	OMPANY			WELL ID:
DRILLED BY:	Chad Odom (S	&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE:	CME-550		DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	
DATE CONSTRU	CTED: Augus	st 21, 2012			<u> </u>
				DEPTH	ELEVATION
				FEET	FFFT
Locking Hinged Top)				
				2.15	596.27
		▋┝┥┣	IOP OF RISER	3.15	590.27
1/4-inch Vent -			Cap Type: Plastic Locking		
	_				
1/4-inch weep Hole	e			0 34	593.46
	111		TOP OF NAIL	0.54	502.42
4-ft x 4-ft concrete	pad <u>assisti</u>	3	GROUND SURFACE	0.0	593.12
			PROTECTIVE CASING		
			SIZE: 4''' x 4'' x 5'		
	ke a a		TYPE: STAINLESS STEEL LOCKING		
	14.2		9		504.67
	1	V 12	BOTTOM OF PROTECTIVE CASING	-1.45	591.67
			BACKFILL MATERIAL		
Water Level @			TYPE: Portland Cement Grout		
time of completion	-16 feet		AMOUNT: 26 gallons		
time of completion.	•				
			RISER CASING		
			DIA: 2-inch		
Delayed water leve	I N/A		TYPE: Schedule 40 PVC		
Date and time:	N/A		JOINT TYPE: Flush Threaded		
			TOP OF SEAL	-21.5	571.62
			ANNULAR SEAL		
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2.8 feet		
			TOP OF FILTER PACK	-24.3	568.82
			FILTER PACK		
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 5.5 bags		
			PLACEMENT: 12.7 feet		
					F 6 6 F 6
			BOTTOM OF RISER/TOP OF SCREEN	-26.6	566.52
			SCREEN (10.0')		
			DIA: 2-inch		
			TYPE: Schedule 40 PVC Prepack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-36.6	556.52
Flush-threaded end	l cap				
(0.4')			BOTTOM OF CASING	-37.0	556.12
		HOLE DIA:	6.75"		



PR	OJECT	: Plant	Ham	mond Ash Pond #4 Well Ins	stalla	ation				J	ЮВ	NC): 1811-12-153	SHE	ET 1	OF	1
PR	OJECT	LOCAT	ION:	Rome, Georgia													
EL	EVATIC	DN: 592	.07 fe	et	во	ORING STAR	TED	: 1	0/2/	/20	12		RIG TYPE:CME-5	50	AUG	BER [DIA. (IN): 6¼
DR	RILLING	METHC	D: H	ollow Stem Augers	BC	BORING COMPLETED: 10/2/2012 HAMMER: Automatic											
	OUND 10 fee 10.75	WATER: t ATD feet on	10/3/ ⁻	12		Remarks:	Mon Ele	itorin vatior	g w n in	ell : N/	set AV[at : D 8	33.7 feet below gr 8.	ound s	surface	9	
G	ELEV (FT.)	.DEPTH (FT.)		MATERIAL DESC	RIPT	ION		L	s	R	М	ΡI	STANDARD P RESISTA 0 10 20	ENETE ANCE (30 40	RATIOI N) 50 60 7	V 0 80 90	BLOWS/6"
V	591.8 581.8 576.8 570.5 560.8 558.1		10' - 15' - 21.3'	SILTY CLAY (CH) with r orange-brown, wet (vact and backfilled for underg clearance) SILTY CLAY (CL) with s fragments and trace sar orange-brown, wet, firm CLAYEY SILT (ML), yell damp to moist, very stiff CLAYEY SANDY SILT (mica, yellow-brown and very stiff to stiff SANDY CLAY (CL) with gray-brown, moist, firm Boring terminated at 33	rock uum grou and, low-l i trac	fragments, excavated nd utility stone brown, with trace nge, moist, ce mica,											100 2 - 3 - 4 (7) 6 - 8 - 10 (18) 6 - 7 - 9 (16) 4 - 7 - 7 (14) 3 - 2 - 3 (5)
		40															



WELL CONSTRUCTION LOG

CLIENT:	SOUTHERN CO	MPANY			WELL ID:
DRILLED BY:	Chad Odom (S&	&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWA-113
RIG TYPE:	CME-550	2 2042	DRILLING METHOD: 4.25" HOLLOW STEM A	AUGERS	
DATE CONSTRUC	CIED: Octobe	er 2, 2012			
					ELEVATION
				FEEI	FEEI
Locking Hinged Top					
			TOP OF RISER	2.83	594.58
1/4-inch Vent			Cap Type: Plastic Locking		
1/4-inch Weep Hole				0.22	592.07
			TOP OF NAIL	0.32	502.07
4-ft x 4-ft concrete p	pad <u>see see see see see see see see see se</u>		GROUND SURFACE	0.0	591.75
			SIZE: 4'' x 4'' x 5'		
			TYPE: STAINLESS STEEL LOCKING		
	2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -				
	(3		BOTTOM OF PROTECTIVE CASING	-1.7	590.05
			PACKEUL MATERIAL		
			TYPE: Portland Cement Grout		
Water Level @	-10.0 feet		AMOUNT: 31.25 gallons		
time of completion.					
			RISER CASING		
Delayed water level	_10 75 feet		DIA: 2-inch TVPE: Schedule 40 PVC		
Date and time:	10/3/12		JOINT TYPE: Flush Threaded		
			TOP OF SEAL	-18.7	573.05
			ANNULAR SEAL		
			TYPE: 3/8-Inch coated bentonite pellets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2.9 feet		570.45
			TOP OF FILTER PACK	-21.6	570.15
			FILTER PACK		
			Drillers Services Inc		
			AMOUNT: 6 bags		
			PLACEMENT: 11.68 feet		
			/	22.00	568.87
			BOTTOM OF RISER/TOP OF SCREEN	-22.88	
			DIA: 2-inch		
			TYPE: Schedule 40 PVC Prepack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			BOTTOM OF SCREEN	-32.88	558.87
Flush-threaded end	сар	┢	Solite in Soliter	02.00	
(0.4')			BOTTOM OF CASING	-33.28	558.47
			6 75"		
		HOLL DIA.	0.75		



SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20



(Continued Next Page)



SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D, AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20



TEST BORING RECORD





WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY		WELL ID:
DRILLED BY: CHAD ODOM (S&ME) LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-101
RIG TYPE: CME-55 DRILLING METHOD: 4.25" HOLLOW STEM /	AUGERS	
DATE CONSTRUCTED: August 7, 2012		
	DEPTH	ELEVATION
	FEET	FEET
TOP OF RISER	3.24	578.85
1/4-inch Vent Cap Type: Plastic Locking		
1/4-inch Weep Hole	0.20	575 91
	0.30	575.51
4-ft x 4-ft concrete pad	0.0	575.61
PROTECTIVE CASING		
SIZE: 4'' x 4'' x 5'		
TYPE: STAINLESS STEEL LOCKING		
	1 25	574.36
BOTTOM OF PROTECTIVE CASING	-1.25	
TYPE: Portland Cement Grout		
Water Level @		
time of completion:		
RISER CASING		
DIA: 2-inch		
Delayed water level10.2 feet TYPE: Schedule 40 PVC		
Date and time: 8/7/12 JOINT TYPE: Flush Threaded		
		556 41
TOP OF SEAL	-19.2	550.41
ANNULAR SEAL		
TYPE: 3/8-Inch coated bentonite pellets		
AMOUNT: 50 lbc		
PLACEMENT: 2.8 feet		
TOP OF FILTER PACK	-22.0	553.91
FILTER PACK		
TYPE: DSI Sand - 1A (20/30)		
Drillers Services, Inc.		
AMOUNT: 6 bags		
PLACEMENT: 12.7 feet		
	24.2	FF1 01
	-24.3	551.31
TYPE: Schedule 40 PVC Prenack		
OPENING WIDTH: 0.01-inch		
OPENING TYPE: Slotted		
SLOT SPACING: 0.25-inch		
SLOT LENGTH: 1.5-inch		545.24
BOTTOM OF SCREEN	-34.3	541.31
Flush-threaded end cap	• • -	
(U.4') BOTTOM OF CASING	-34.7	540.91
		1



TEST BORING RECORD





WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY		WELL ID:
DRILLED BY: Sean Denty (Southern Co.) LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: CME-550 DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	
DATE CONSTRUCTED: August 7, 2012	DEDTU	
	DEPTH	ELEVATION
	FEET	FEET
Locking Hinged Top		
TOP OF RISER	3.33	577.54
1/4-inch Vent Cap Type: Plastic Locking		
1/4-inch Weep Hole	0 33	574.54
	0.55	F74 01
4-ft x 4-ft concrete pad	0.0	574.21
TITE. STAINLESS STELL LOCKING		
BOTTOM OF PROTECTIVE CASING	-1 35	572.86
	1.00	
A BACKFILL MATERIAL		
TYPE: Portland Cement Grout		
time of completion -11.9 feet AMOUNT: 51 gallons		
RISER CASING		
DIA: 2-inch		
Delayed water level		
Date and time: 8/15/12 JOINT TYPE: Flush Threaded		
	10.7	556.01
	-18.2	550.01
TVDE: 2/8 inch coated bentonite nellets		
5-gal huckets		
AMOUNT: 50 lbs		
PLACEMENT: 2.7 feet		
TOP OF FILTER PACK	-20.9	553.31
FILTER PACK		
TYPE: DSI Sand - 1A (20/30)		
Drillers Services, Inc.		
AMOUNT: 6.5 bags		
PLACEMENT: 13.2 feet		
	22 7	550.51
	-23.7	
SCREEN (10.0)		
TVDE: Schedule //0 DV/C Prenack		
OPENING TYPE: Slotted		
SLOT SPACING: 0.25-inch		
SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	-33.7	540.51
Flush-threaded end cap		
(0.4') BOTTOM OF CASING	-34.1	540.11
HOLE DIA: 6.75"		



PRO	OJECT:	Plant I	Hamr	mond Ash Pond #4 Well In	stallation				JOE	B NC): 1811-12-153	SHEE	T 1	OF 1
PRC	OJECT	LOCATI	ON:	Rome, Georgia										
ELE	VATIO	N: 577.	76 fe	et	BORING START	ED:	8/	7/20	12		RIG TYPE:CME-5	5	AUGE	R DIA. (IN): 6.75
DRI	ILLING	METHO	D: Ho	ollow-Stem Augers	BORING COMPL	ETE	D: 8/	7/20	12		HAMMER: Autom	atic		
	OUNDV 11.5 fe 12.60 f	VATER: eet ATD feet on 8	8/16/1	2	Remarks: M E	onit Ieva	orino ation	g wel ⊤in N	ll set NAV	∶at∶ D 8	34.3 feet below gro 8.	ound s	urface	
G	ELEV. (FT.)	.DEPTH (FT.)		MATERIAL DESC	RIPTION		L	S R	м	PI	STANDARD P RESISTA 0 10 20	ENETR NCE (1 30 40	ATION N) 50 60 70 8	BLOWS/6"
∑ Ž	577.8 <u>-</u> 571.5 -	- 0 - 5 - 10 	6' -	TOPSOIL, grass, roots SILT (ML) with trace mi to brown, dry, stiff CLAYEY SILT (ML) with brown and light gray, da stiff to firm	ca, dark brown						99			2 - 4 - 5 (9) 7 - 5 - 4 (9) 2 - 3 - 4 (7)
	557.5 -		20' -	CLAYEY SILT (ML) with and fine sand, brown, n	n trace mica noist, soft						• 4			2 - 2 - 2 (4)
	548.0 -	- 25 - - 30 -	29.5	CLAYEY FINE SAND (micaceous, brown, moi SANDY CLAYEY SILT with trace mica and she	SC), st, very loose (MH), organic ell fragments,						0			0 - 0 - 0 (0)
	543.0 ⁻ 541.5		34.5'-	dark gray, moist, very s SAND (SP), medium to yellow-brown, wet, firm Boring terminated at 3	oft 						•15			6 - 8 - 7 (15)



WELL CONSTRUCTION LOG

CLIENT: SOU	THERN COMPANY	· ·		WELL ID:
DRILLED BY: Chad	Odom (S&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-103
RIG TYPE: CME	-55	DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	
DATE CONSTRUCTED	: August 8, 2012		DEPTH	
			FFFT	
				FEEI
Locking Hinged Top				
		TOP OF RISER	3.38	580.79
1/4-inch Vent —		Cap Type: Plastic Locking		
1/4-inch weep Hole		ΤΟΡ ΟΕ ΝΑΙΙ	0.35	577.76
4-ft x 4-ft concrete pad		GROUND SURFACE	0.0	577.41
			0.0	
		PROTECTIVE CASING		
		SIZE: 4'" x 4" x 5'		
		TYPE: STAINLESS STEEL LOCKING		
		BOTTOM OF PROTECTIVE CASING	-13	576.11
			1.5	
		BACKFILL MATERIAL		
Water Level @		TYPE: Portland Cement Grout		
time of completion: $\frac{-11}{-11}$		AMOUNT: 43 gallons		
		DIA: 2-inch		
Delayed water level	-12.60 feet	TYPE: Schedule 40 PVC		
Date and time:	8/16/12	JOINT TYPE: Flush Threaded		
		TOP OF SEAL	-19 7	557.71
		ANNULAR SEAL	13.7	
		TYPE: 3/8-inch coated bentonite pellets		
		5-gal buckets		
		AMOUNT: 50 lbs		
		TOP OF FILTER PACK	-21.9	555.88
		FILTER PACK		
		TYPE: DSI Sand - 1A (20/30)		
		Drillers Services, Inc.		
		AMOUNT: 5.5 bags PLACEMENT: 12.4 feet		
		BOTTOM OF RISER/TOP OF SCREEN	-23.9	553.51
		SCREEN (10.0')		
		DIA: 2-inch TVPE: Schedule 40 DVC Prepack		
		OPENING WIDTH: 0.01-inch		
		OPENING TYPE: Slotted		
		SLOT SPACING: 0.25-inch		
		SLOT LENGTH: 1.5-inch	22.0	543 51
Flush-threaded end can		BUTTOW OF SCREEN	-33.9	0.001
(0.4')		BOTTOM OF CASING	-34.3	543.11
	HOLE DIA:	0.75		
				1



FROJECT. FIAIIL	Hammond Ash Pond #4 Well Ins	stallation		JOB NO	D: 1811-12-153	SHEET 1 O	= 1	
PROJECT LOCAT	TION: Rome, Georgia							
ELEVATION: 579	0.08 feet	BORING STARTED:	BORING STARTED: 8/8/2012 RIG TYPE:CME-55 AUG					
DRILLING METHO	DD: Hollow-Stem Augers	BORING COMPLETE	D: 8/8/2(012	HAMMER: Autom	atic		
GROUNDWATER V 18 feet ATD V 15.12 feet on	: 8/16/12	Remarks: Monit Eleva	oring we tion in N	ell set at NAVD 88	41.4 feet below gr	ound surface		
G ELEV.DEPTH (FT.) (FT.)	H MATERIAL DESCR	RIPTION	L S F	R M PI	STANDARD P RESISTA 0 10 20	2ENETRATION ANCE (N) 30 40 50 60 70 80 9	BLOWS/6"	
579.08 0 - - 5 - - 10 - 567.1 - 565.0 - 15 - 561.0 - - 20 - 555.0 - 25 - 551.0 - - 30 - - - 30 - - - - - - - - - - - - - -	0.1' TOPSOIL, grass, roots SILT (ML) with trace mid sand, brown to light brow 12' Undisturbed sample 14' CLAYEY SILT (ML) with and fine sand, light brow 18' SILTY CLAY (CH) with t brown, wet, very soft 24' CLAYEY SILT (MH) with and fine sand, light brow soft 28' CLAYEY FINE SAND (S mica, dark gray, wet, ver brown medium sand, we yellow-brown coarse sar brown medium sand, we 40.3 WEATHERED SHALE w yellow-brown, moist, stiff Boring terminated at 41	trace mica n, moist, soft race mica, n, moist, soft race mica, n, wet, very C) with trace ry loose					2 - 3 - 4 (7) $2 - 2 - 3 (5)$ $0 - 1 - 2 (3)$ $0 - 0 - 0 (0)$ $0 - 0 - 0 (0)$ $0 - 1 - 2 (3)$ $0 - 2 - 6 (8)$ $5 - 6 - 8 (14)$	

Project Manager: J. Heywood, PE



WELL CONSTRUCTION LOG

CLIENT: SO	OUTHERN CON	MPANY			WELL ID:
DRILLED BY: Ch	nad Odom (S&	ME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-105
RIG TYPE: CI	ME-55		DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	
DATE CONSTRUCT	ED: August	8, 2012			
				DEPTH	ELEVATION
	_			FEET	FEET
Locking Hinged Top					
	-				
				()	500.00
			TOP OF RISER	(3.37)	582.09
1/4-inch Vent —			Cap Type: Plastic Locking		
1/4-inch Weep Hole				0 36	579.08
A ft v A ft concrete no.	A			0.00	578 72
4-ft x 4-ft concrete pa			GROUND SURFACE	0.0	576.72
			TYPE: STAINIESS STEELLOCKING		
	1	4 - X	BOTTOM OF PROTECTIVE CASING	-1.45	577.27
			BACKFILL MATERIAL		
Water Level @			TYPE: Portland Cement Grout		
time of completion:	-18 feet		AMOUNT: 55 gallons		
			RISER CASING		
Delayed water level	-15 12 foot		DIA. 2-IIICII TYPE: Schedule 40 DVC		
Date and time:	8/16/12		JOINT TYPE: Flush Threaded		
Bute and time.					
			TOP OF SEAL	-25.0	553.72
			ANNULAR SEAL		
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2 feet	27.0	552.09
				-27.0	
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 5.5 bags		
			PLACEMENT: 14.4 feet		
					E 4 7 7 7
			BOTTOM OF RISER/TOP OF SCREEN	-31.0	547.72
			SCREEN (10.0°)		
			DIA: 2-Inch TVDE: Schedule 40 DVC Bronack		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-41.0	537.72
Flush-threaded end ca	ар				507.40
(0.4')			BOTTOM OF CASING	-41.3	537.42
	l.				
			6 75"		
		ITULE DIA.	0.75		
L					1



PR	COJECT: Plant Hammond Ash Pond #4 Well Ins	tallation		JOB NO): 1811-12-153	SHEET	1 OF 1
PR	OJECT LOCATION: Rome, Georgia						
ELE	EVATION: 576.43feet	BORING STARTED	: 8/8/2	012	RIG TYPE:CME-5	5 4	AUGER DIA. (IN): 6.75
DR	RILLING METHOD: Hollow-Stem Augers	BORING COMPLET	ED: 8/8/2	012	HAMMER: Autom	atic	
GR ∑ ▼	ROUNDWATER: 14.5 feet ATD 12.35 feet on 8/14/12	Remarks: Mon Ele	itoring we	ell set at NAVD 8	35.0 feet below gr 8.	ound surf	face
G	ELEV.DEPTH (FT.) (FT.) MATERIAL DESCR	RIPTION	LSF	R M PI	STANDARD P RESISTA 0 10 20	ENETRAT NCE (N) 30 40 50	FION BLOWS/6" 60 70 80 90100
	576.4 0 0.3 TOPSOIL, roots, grass SILT (ML) with trace mic sand, brown, damp, firm 566.9 10 9.5' 566.9 10 9.5' 561.9 15 14.5' 557.9 20 19.5' 557.9 20 19.5' 551.9 25 24.5 CLAYEY FINE SAND (Smica, brown, wet, very loc 551.9 25 24.4 - 546.4 30 30' SAND (SP), medium to fmica, brown, wet, very loc 540.4 - 40 - 40 - 40 - 40 - 40 -	a and fine / a and fine / , with trace // , with trace // , with trace // , with trace // C) with trace // oose // ine with trace // oose // feet // // // // // // // //					3 - 4 - 3 (7) 3 - 3 - 2 (5) 2 - 2 - 2 (4) 1 - 2 - 2 (4) 6 - 12 - 11 (23) 12 - 19 - 24 (43)



WELL CONSTRUCTION LOG

CLIENT:	SOUTHERN CO	MPANY			WELL ID:
DRILLED BY:	Chad Odom (S&	ME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-107
RIG TYPE:	CME-55		DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	110110-107
DATE CONSTRU	CTED: August	8, 2012			
				DEPTH	ELEVATION
				FEET	FEET
Locking Hingod Tor	→				
LOCKING HINGEU TOP	5				
				3.2	579.31
1/4-inch Vent			Can Type: Plastic Locking	5.2	
1/4-men vent		▶	oup Type. Thashe Locking		
1/4-inch Ween Hol	e				
2, ·			TOP OD NAII	0.32	576.43
A-ft x A-ft concrete	nad		GROUND SUBFACE	0.0	576.11
				0.0	0/0/11
			BOTTOM OF PROTECTIVE CASING	-15	574.61
	×.			1.5	
			BACKFILL MATERIAL		
			TYPE: Portland Cement Grout		
Water Level @	-14.5 feet		AMOUNT: 22 gallons		
time of completion	i:		0		
			RISER CASING		
			DIA: 2-inch		
Delayed water leve	el -12.35 feet		TYPE: Schedule 40 PVC		
Date and time:	8/14/12		JOINT TYPE: Flush Threaded		
			TOP OF SEAL	-20.0	556.11
			ANNULAR SEAL		
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2 feet		55/11
			TOP OF FILTER PACK	-22.0	554.11
			FILTER PACK		
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 6.25 bags		
			PLACEMENT: 13 feet		
				24.6	551.51
			SCREEN (10.0')	-24.0	
			DIA: 2-inch		
			TYPE: Schedule 40 PVC Prenack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-34.6	541.51
Flush-threaded end	d cap ———				1
(0.4')			BOTTOM OF CASING	-35	541.11
	•				
		HOLE DIA:	6.75"		



TEST BORING RECORD





WELL CONSTRUCTION LOG

CLIENT: S	OUTHERN CO	MPANY			WELL ID:
DRILLED BY: C	had Odom (S&	&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-109
RIG TYPE: C	ME-55		DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	
DATE CONSTRUC	TED: August	: 15, 2012			
				DEPTH	ELEVATION
				FEET	FEET
Locking Hinged Top					
					576 77
		▋┝┥┣─	TOP OF RISER	3.46	570.77
1/4-inch Vent —			Cap Type: Plastic Locking		
1/4-inch Ween Hole					
	\rightarrow		TOP OF NAIL	0.35	573.66
4-ft x 4-ft concrete pa	ad answer		GROUND SURFACE	0.0	573.31
	<u> </u>			0.0	
			PROTECTIVE CASING		
			SIZE: 4'" x 4" x 5'		
			TYPE: STAINLESS STEEL LOCKING		
					E 72 01
	K.		BOTTOM OF PROTECTIVE CASING	-1.3	572.01
			BACKEILI MATERIAI		
			TYPE: Portland Cement Grout		
Water Level @	-24.5 feet		AMOUNT: 13.5 gallons		
time of completion:					
			RISER CASING		
			DIA: 2-inch		
Delayed water level	-6.0 feet		TYPE: Schedule 40 PVC		
Date and time:	8/16/12		JOINT TYPE: Flush Threaded		
			τορ οε seal	-13.4	559.91
			ANNULAR SEAL	13.4	
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2.1 feet		EE7 01
			TOP OF FILTER PACK	-15.5	557.81
			FILTER PACK $-TYPE \cdot DSI Sand - 1A(20/20)$		
			Drillers Services. Inc.		
			AMOUNT: 7 bags		
			PLACEMENT: 12.4 feet		
					555.04
			BOTTOM OF RISER/TOP OF SCREEN	-17.5	555.81
			SCREEN (10.0')		
			DIA: 2-Inch TVDE: Schedule 40 DVC Bronack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-27.5	545.81
Flush-threaded end c	ар				
(0.4')			BOTTOM OF CASING	-27.9	545.41
		HOLE DIA:	6.75"		

Log updated with revised survey certified 5/11/2020.

Well was abandoned on July 13, 2023.



BORING NO.: HGWC-117

TEST BORING RECORD



Well was abandoned on July 13, 2023.

GEORGIA POWER PLANT HAMMOND ASH POND #4 ROME, GEORGIA



WELL CONSTRUCTION LOG

CLIENT: SO	UTHERN CO	MPANY			WELL ID:
DRILLED BY: Cha	d Odom (S&	kME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-117
RIG TYPE: CM	E-55		DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	
DATE CONSTRUCTE	D: August	14, 201	2		
				DEPTH	ELEVATION
				FEET	FT, MSL
Locking Hinged Top					
				1	
				1	
			TOP OF RISER	2.96	581.98
1/4-inch Vent —			Cap Type: Plastic Locking		
		▶		1	
1/4-inch Weep Hole				I	
					570.00
4-ft x 4-ft concrete pad	<u> </u>		GROUND SURFACE	0.0	579.02
				l	
				1	
			SIZE: 4" x 4" x 5"	1	
			IPPE: STAINLESS STEEL LOCKING	1	
	Jes e			15	577 52
	4		BOTTOWI OF PROTECTIVE CASING	-1.5	577.52
				1	
			TYPE: Portland Cement Grout	1	
Water Level @	-18.5 feet		AMOUNT: 41 gallons	1	
time of completion: —			Ğ	1	
			RISER CASING	1	
			DIA: 2-inch	1	
Delayed water level	N/A		TYPE: Schedule 40 PVC	1	
Date and time:	N/A		JOINT TYPE: Flush Threaded	1	
					FF7 22
			TOP OF SEAL	-21.7	557.32
			ANNULAR SEAL	1	
			F gal buckets	1	
				1	
			PLACEMENT: 3.2 feet	1	
			TOP OF FILTER PACK	-24.9	554.12
			FILTER PACK		
			TYPE: DSI Sand - 1A (20/30)	1	
			Drillers Services, Inc.	1	
			AMOUNT: 6 bags	1	
			PLACEMENT: 12.4 feet	I	
					552 12
			BOTTOM OF RISER/TOP OF SCREEN	-26.9	552.12
			SCREEN (10.0°)	1	
			DIA: 2-Inch TVIDE: Schedule 40 DVC Prepack	I	
		4		1	
			OPENING TYPE: Slotted	I	
			SLOT SPACING: 0.25-inch	1	1
			SLOT LENGTH: 1.5-inch	1	1
			BOTTOM OF SCREEN	-36.9	542.12
Flush-threaded end cap					
(0.4')			BOTTOM OF CASING	-37.3	541.72
				1	1
		HOLE DIA	A: 6.75"	1	1
					l



SCS MONITORING WELLS MW-51 AND HGWC-117A.GPJ ACP GINT LIBRARY CH.GLB 9/9/2



PRO	OJECT	: Plant	Hami	mond Ash Pond #4 Well Ins	stallation				JOE	3 NC): 1811-12-153	SHEE	T 1	OF	1
PRO	OJECT	LOCAT	ION:	Rome, Georgia											
ELE	VATIC	N: 576	.52 fe	et	BORING STA	RTED): 1()/1/2	012		RIG TYPE:CME-5	50	AUGE	ER DI	IA. (IN): 6¼
DRI	ILLING	METHO	DD: Ho	ollow Stem Augers	BORING COM	IPLE1	TED: 1()/1/2	012		HAMMER: Autom	atic	-		
	OUND\ 20 fee 13.85	WATER t ATD feet on	: 10/3/ [,]	12	Remarks:	Mor Ele	nitorinę evation	g wel ⊤in N	II set NAVI	t at : D 8	38.2 feet below gr 8.	ound s	Jrface		
G	ELEV (FT.)	DEPTH (FT.)	1	MATERIAL DESCI	RIPTION		L	S R	м	PI	STANDARD F RESIST/ 0 10 20	ENETR ANCE (N 30 40	ATION 1) 50 60 70	80 90 10	BLOWS/6"
¥	576.5	- 5 -	0.5'	CRUSHED LIMESTONE SILTY CLAY-CLAYEY S with trace mica, red-brow orange-brown, damp to	E BILT (CL-ML) wn to moist, stiff						•9 •11				3 - 4 - 5 (9) 4 - 5 - 6 (11)
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	561.7		- 15' -	CLAYEY SILT (ML) with orange-brown, moist, fir	trace mica, m										3 - 3 - 5 <b>(8)</b>
Ā	557.4	20  25	24.5'-	SANDY CLAYEY SILT ( mica, orange-brown, we SILTY FINE SAND (SM	ML) with trace t, soft						•2				1 - 1 - 1 <b>(2)</b> 2 - 1 - 2 <b>(3)</b>
	547.2 ·	- - - - - - - -	29.3'- 	SAND (SW) well sorted, coarse grained with trac brown to orange, dense	medium and e mica, dark		· · · · · · · · · · · · · · · · · · ·					•4	2		6 - 20 - 22 <b>(42)</b>
	541.4	35 - - - -	-35.1'- - - -	SAND AND GRAVEL (S wet, firm	P-GP), brown						•15				9 - 9 - 6 <b>(15)</b>
	535.7 533.5	- 40 - - - - - - - 45 - - -	40.8'-  	Weathered gray dolomit yellow-brown silty clay Boring terminated at 43	e with	RESIDUUM									929 - 7 - 50/1 <b>(50+</b>
		L 50 -													



### WELL CONSTRUCTION LOG

CLIENT:	SOUTHERN CO	MPANY			WELL ID:
DRILLED BY:	Chad Odom (S8	ιME)	LOGGED BY: PAT GRIBBEN (S&ME)		HGWC-118
RIG TYPE:	CME-550		DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	
DATE CONSTR	UCIED: Octobe	r 1, 2012			
					ELEVATION
		-		FEET	FEEI
Locking Hinged To	ор				
				2.85	579.02
1/4-inch Vent			Cap Type: Plastic Locking	2.05	
if i men vene		▶			
1/4-inch Weep H	ole				
			TOP OF NAIL	0.35	576.52
4-ft x 4-ft concret	e pad		GROUND SURFACE	0.0	576.17
			STAINLESS STEEL LOCKING		
	es esta		BOTTOM OF PROTECTIVE CASING	-1.8	574.37
			BACKFILL MATERIAL		
Water Level @	20.0 feet		TYPE: Portland Cement Grout		
time of completion	on:		AMOUNT: 37.5 gallons		
			RISER CASING		
			DIA: 2-inch		
Delayed water level	vel <u>-13.85 feet</u>		TYPE: Schedule 40 PVC		
Date and time:	10/3/12		JOINT TYPE: Flush Threaded		
				-21 9	554.27
			ANNULAR SEAL	21.5	
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 4.1 feet	26.0	550 17
			FILTER PACK	-20.0	550.17
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 6.5 bags		
			PLACEMENT: 12.06 feet		
			BOTTOM OF RISER/TOP OF SCREEN	-27.66	548.51
			SCREEN (10.0')	27.00	
			DIA: 2-inch		
			TYPE: Schedule 40 PVC Prepack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-37.66	538.51
Flush-threaded e	nd cap	┢			
( 0.4' )			BOTTOM OF CASING	-38.06	538.11
		HOLE DIA	: 6.75"		

ב וואפ ב	Lo	g u	pda	ted with revised survey certified 5/11/2020.					
	-	50	DU		F TES	ST B(	RIN	G	BORING AP02-MW12 PAGE 1 OF 1 ECS37736
	-			COMPANY				6	
	S	OU EAR	JTH TH	IERN COMPANY SERVICES, INC. I SCIENCE AND ENVIRONMENTAL ENGINEERING	PRO LOC	JECT <u>A</u>	sh Pond Plant Ha	Piezometers mmond	
	DA CC		ST/	ARTED <u>10/21/2014</u> COMPLETED <u>10/21/2014</u> S	URF. ELE	EV. <u>580.5</u>	9 100 Ho		ES: N:1547853.78 E:1937525.45
	DR	ILL	ED	BY T. Milam LOGGED BY W. Shaughnessy		KED BY	L. Millet	AN	IGLE BEARING
	BC	RIN	IG I	DEPTH _35.2 ft GROUND WATER DEPTH: DURIN	IG _20 ft.	c	OMP.	DE	ELAYED 16.4 ft. after 24 hrs.
	NC	TE	s _	Well installed. Refer to well data sheet.			1		
	Ш Ц		2	STRATA DESCRIPTION		LE TYPE MBER	.E DEPTH (ft.)	BLOW COUNTS <b>(N-VALUE)</b>	COMMENTS
		9 2 2 2 2 2			ELEV	SAMP	SAMPL	PERCENT RECOVERY (RQD)	
		Π		Silt (ML)					
20110		Π		- brown and dark brown, dry, very stiff, clayey		SS 1	3.5-5.0	5-7-8 ( <b>15</b> )	
	<u>Ω</u>							(13)	
				- brown and dark brown, dry, medium stiff, clayey		SS SS	8.5-	3-4-4	
	=					▲ -2	10.0	(8)	
				- brown and brown-yellow, damp, medium stiff, mica		ss s	13.5-	3-2-3	
	1					-3	15.0	( 5)	
יאפאטר			Ľ	_					
NOW!S				- brown and brown-yellow, very moist to wet, medium		▼ ss	18.5-	2-4-4	
10:23 -	50		Ž	7 stiff, some very fine grained sand		▲ <u>-4</u>	20.0	( 8)	
. 1/01/1				Sandy Silt (ML)	558.59				
- פח פח				- brown, wet, soft, mica		▼ ss	23.5-	2-2-2	
IABASI	22				554 59	<b>▲</b> -5	25.0	( 4)	
		┛᠇┹	1- 41 7	Silty Sand (SM)					
				brown wat loose fine grain trace searce grained			20 5	242	
	30		末来	sand		-6	28.5- 30.0	(7)	
			1	- brown, wet, medium dense, fine grain, trace coarse grained sand	546.59		00-		
	35	L. L.		Well-graded Sand (SW)	545.39	SS -7	33.5- 35.0	7-9-9 ( <b>18</b> )	
כחוד פבר		<u> </u>	<u> </u>	Bottom of borehole at 35.2 feet.					Easting and Northing in NAVD 88. Elevation in NAD 83.

SOUT	THERN COMP	ANY	RECOR WELL CONST	D OF RUCTION	WELL: AP02-MW1 PAGE 1 OF ECS3773
SOUTHI EARTH S	ERN COMI SCIENCE A	PANY SERVI And Envir	CES, INC. PROJE DNMENTAL ENGINEERING LOCAT	CT Ash Pond Piezometers  ION Plant Hammond	
DATE STAI	RTED _10/2	21/2014 0	COMPLETED 10/21/2014 SURF. ELEV	. <u>580.59</u> COORDINATES: <u>N:</u> 1	547853.78 E:1937525.45
ONTRAC ⁻ RILLED B	TOR <u>SCS</u> BY <u>T. Milar</u>	Field Service	EQUIPMENT CME 550 CGGED BY W. Shaughnessy CHECKE	METHOD         Hollow Stem Auger; Hollow           DBY         L. Millet         ANGLE	v Stem Auger BEARING
BORING DI	EPTH <u>35.2</u> Vell installe	2 ft. <b>G</b> d. Refer to w	ROUND WATER DEPTH: DURING 20 ft.	COMP DELAYED	16.4 ft. after 24 hrs.
OREHOLE DATA	E E Top of	Casing Elev: 583	.27 WELL DATA		COMMENTS
ELEV. Strata	DEPTI	Surfac	e: tive aluminum cover with bollards; 4-foot sq	uare concrete pad ELEV. IDEPTHI	
58.59			urface Seal: concrete <b>ell: 2" OD PVC (SCH 40)</b> nnular Fill: Cement-Bentonite Grout (3 - 94lt nnular Seal: 3/8 bentonite pellets (1 - 50lbs. Iter: #1A silica filter sand (6 - 50lbs. bags)	578.59 [2.0] os. bags, 33 gal.) 561.59 [19.0] bucket) 557.59 [23.0] 555.84 [24.8]	
46.59 15.39	•••	s s	creen: 10 ft. 0.010" slot pre-pack ump:0.40 ft.		
					Elevation in NAD 83.



# **S&ME** TEST BORING RECORD





### WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY		WELL ID:
DRILLED BY: Sean Denty (Southern Co.) LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: CME-550 DRILLING METHOD: 4.25" HOLLOW STEM	I AUGERS	GWC-4
DATE CONSTRUCTED: August 8, 2012		
	DEPTH	ELEVATION
	FEET	FEET
Locking Hinged Top		
TOP OF RISER	2.92	580.65
1/4-inch Vent Cap Type: Plastic Locking		
1/4-inch Weep Hole	0.36	577 73
TOP OF NAIL	0.50	577.75
4-ft x 4-ft concrete pad	0.0	5/7.37
PROTECTIVE CASING		
BOTTOM OF PROTECTIVE CASING	-1.45	575.92
	1.10	
BACKFILL MATERIAL		
Water Level @ TYPE: Portland Cement Grout		
time of completion: <u>-20 feet</u> AMOUNT: 47 gallons		
Dialeura durastera laural N (A		
Delayed water level N/A I PPE: Schedule 40 PVC		
TOP OF SEAL	-27.6	549.77
ANNULAR SEAL		
TYPE: 3/8-inch coated bentonite pellets		
5-gal buckets		
AMOUNT: 50 lbs		
PLACEMENT: 4.3 feet	24.0	545 47
	-31.9	545.47
TVPE: DSI Sand - 14 (20/30)		
Drillers Services. Inc.		
AMOUNT: 6 bags		
PLACEMENT: 12.4 feet		
		E 4 2 4 7
BOTTOM OF RISER/TOP OF SCREEN	-33.9	545.47
SCREEN (10.0')		
DIA: 2-Inch		
OPENING TYPE: Slotted		
SLOT SPACING: 0.25-inch		
SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	-43.9	533.47
Flush-threaded end cap		
( 0.4' ) BOTTOM OF CASING	-44.3	533.07



PR	OJECT:	Plant Ha	mmond Ash Pond #4 Well In	stallation		JOB NC	: 1811-12-153	SHEET 1 (	DF 1		
PR	OJECT	LOCATIO	N: Rome, Georgia	1							
ELE	EVATIO	N: 578.55	i feet	BORING STARTE	D: 8/13/2	2012	RIG TYPE:CME-5	5 AUGE	R DIA. (IN): 6.75		
DRI	ILLING	METHOD:	Hollow-Stem Augers	BORING COMPLE	3ORING COMPLETED: 8/13/2012 HAMMER: Automatic						
	OUNDV 15 feet 14.2 fe	VATER: ATD et on 8/20	/12	Remarks: Mo Ele	nitoring we	ell set at 3	34.7 feet below gro	ound surface			
G	ELEV. (FT.)	DEPTH (FT.)	MATERIAL DESCI	RIPTION	LSF	R M PI	STANDARD P RESISTA 0 10 20	ENETRATION NCE (N) 30 40 50 60 70 8	BLOWS/6"		
	578.5	0 - 0 	^{5'} TOPSOIL, grass, roots SILTY FINE SAND (SM mica, yellow-brown to b damp, loose	) with trace rown, moist to			•8 •6		5 - 5 - 3 <b>(8)</b> 3 - 3 - 3 <b>(6)</b>		
<u>,</u>	563.5 ⁻ 559.0		5' SAND (SP), fine to med mica, brown, wet, very k	ium with trace bose SC) with trace			•4 •4		1 - 2 - 2 <b>(4)</b>		
	553.5		5' SILTY FINE SAND (SM mica, brown, wet, very l	) with trace bose			•4		1 - 2 - 2 <b>(4)</b>		
	543.5	- 30	5' SAND (SP), fine with tra to light gray, occasional wet, loose 5' SAND AND GRAVEL (S	iron staining, iP-GP), by sorted some	• • •			•38	6 - 19 - 19 <b>(38)</b>		
	540.5		medium to coarse, poor rounded quartz pebble, wet, dense Boring terminated at 38	y sorted, some yellow-brown,							



### WELL CONSTRUCTION LOG

CLIENT: SC	DUTHERN CO	MPANY			WELL ID:
DRILLED BY: Ch	ad Odom (S&	&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: CN	ИЕ-55		DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	GWC-6
DATE CONSTRUCT	ED: August	t 13, 2012		DEDTU	
				DEPTH	ELEVATION
				FEET	FEET
Locking Hinged Top					
			TOP OF RISER	3.43	581.63
1/4-inch Vent —			Cap Type: Plastic Locking		
1/4-inch Weep Hole	$\rightarrow$			0.35	578 55
			GROUND SURFACE	0.55	570.55
4-ft x 4-ft concrete pac			GROUND SURFACE	0.0	578.20
	× × × × × ×				
	Je Ve		BOTTOM OF PROTECTIVE CASING	-1.3	576.90
	·				
			BACKFILL MATERIAL		
Water Loval @			TYPE: Portland Cement Grout		
time of completion:	-15 feet		AMOUNT: 33 gallons		
time of completion.					
			RISER CASING		
			DIA: 2-inch		
Delayed water level	N/A		TYPE: Schedule 40 PVC		
Date and time:	N/A		JOINT TYPE: Flush Threaded		
				10.0	559 20
				-19.0	555.20
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2 feet		
			TOP OF FILTER PACK	-21.0	557.20
			FILTER PACK		
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 5.5 bags		
			PLACEMENT: 13.7 feet		
				-24.2	553 90
			SCREEN (10.0')	-24.5	555.50
			- DIA: 2-inch		
			TYPE: Schedule 40 PVC Prepack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-34.3	543.90
Flush-threaded end ca	р			<u> </u>	- 40 - 0
( 0.4' )			BOTTOM OF CASING	-34.7	543.50
			6 75"		
		HOLL DIA.	0.75		
				L	



PROJECT: Plant H	ammond Ash Pond #4 Well Ins	stallation		JOB NC	): 1811-12-153	SHEET	Г 1 OF	1
PROJECT LOCATIO	ON: Rome, Georgia							
ELEVATION: 577.1	13 feet	BORING STARTED	: 8/9/2	012	RIG TYPE:CME-5	5	AUGER DI	A. (IN): 6.75
DRILLING METHO	D: Hollow-Stem Augers	BORING COMPLETED: 8/9/2012 HAMMER: Automatic						
GROUNDWATER: V 19 feet ATD I1.81 feet on 8	/15/12	Remarks: Mor Ele ^v	nitoring we	ell set at 3	37.7 feet below gro 3.	ound su	rface	
G ELEV.DEPTH (FT.) (FT.)	MATERIAL DESCR	RIPTION	L S F	R M PI	STANDARD P RESISTA 0 10 20	ENETRA NCE (N) 30 40 50	TION ) 60 70 80 9010	BLOWS/6"
577.1       0         572.6       5         576.6       10         565.1       -         565.1       -         555.1       -         555.1       -         552.8       25         -       -         546.6       -         543.1       35         540.1       -         -       -         -       40         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -	<ul> <li>0.3' TOPSOIL, grass, roots SILT (ML) with trace mic sand, red-brown, dry to 4</li> <li>4.5' SILTY FINE SAND (SM) mica, light brown, damp</li> <li>9.5' CLAYEY FINE SAND (S mica, light brown, moist, SANDY CLAY (CH) with light brown, moist to wet</li> <li>22' Undisturbed sample</li> <li>24' CLAYEY SAND (SC) with light brown, wet, very loo</li> <li>30.5</li> <li>30.5</li> <li>SAND (SP) with some g rounded quartz pebbles, gray, weathered shale fr Undisturbed sample</li> <li>34' Undisturbed sample SAND (SP) medium gra gravel and rounded quar red-brown to gray, weath fragments and gray silty very stiff Boring terminated at 37</li> </ul>	a and fine damp with trace loose C) with trace very loose trace mica, soft th trace mica, se to loose ravel and red-brown to agments ined with some rtz pebbles, hered shale clay at 37', <i>feet</i>						3 - 2 - 3 <b>(5)</b> 2 - 1 - 2 <b>(3)</b> 1 - 5 - 4 <b>(9)</b> 3 - 6 - 17 <b>(23)</b>



### WELL CONSTRUCTION LOG

CLIENT: SOUTH	HERN COMPANY			WELL ID:
DRILLED BY: Chad O	dom (S&ME)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: CME-5	5	DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	GWC-8
DATE CONSTRUCTED:	August 9, 2012		DEDTU	
			DEPTH	ELEVATION
			FEET	FEET
Locking Hinged Top				
		TOP OF RISER	3.22	579.99
1/4-inch Vent ———		Cap Type: Plastic Locking		
1/4-inch Weep Hole			0.36	577 13
		TOP OF NAIL	0.50	577.15
4-ft x 4-ft concrete pad		GROUND SURFACE	0.0	5/6.//
		/ 🔪		
		PROTECTIVE CASING		
		TTPE. STAINLESS STEEL LOCKING		
		BOTTOM OF PROTECTIVE CASING	-15	575.28
			1.5	0/0120
		BACKFILL MATERIAL		
Watar Laval		TYPE: Portland Cement Grout		
time of completion: -19	9 feet	AMOUNT: 32 gallons		
		RISER CASING		
		DIA: 2-inch		
Delayed water level -11	1.81 feet	TYPE: Schedule 40 PVC		
Date and time: 8/	/15/12	JOINT TYPE: Flush Threaded		
			-20.0	556 77
			-20.0	550.77
		TYPE: 3/8-inch coated bentonite pellets		
		5-gal buckets		
		AMOUNT: 50 lbs		
		PLACEMENT: 2 feet		
		TOP OF FILTER PACK	-22.0	554.77
		FILTER PACK		
		TYPE: DSI Sand - 1A (20/30)		
		Drillers Services, Inc.		
		AMOUNT: 5.5 bags		
		PLACEMENT: 15.7 feet		
		BOTTOM OF RISER/TOP OF SCREEN	-27.3	549.47
		SCREEN (10.0')	-27.5	
		- DIA: 2-inch		
		TYPE: Schedule 40 PVC Prepack		
		OPENING WIDTH: 0.01-inch		
		OPENING TYPE: Slotted		
		SLOT SPACING: 0.25-inch		
		SLOT LENGTH: 1.5-inch		F20 47
		BOTTOM OF SCREEN	-37.3	559.47
Flush-threaded end cap	<b>►</b>		~	F 2 2 2 7
( 0.4' )		BOTTOM OF CASING	-37.7	539.07
		6.75"		
	HOLL DIA.			
J			I	



PR	OJECT:	: Plant	Hamr	nond Ash Pond #4 Well Ins	tallation				JOE	B NC	D: 1811-12-153	SHEE	T 1 0	F 1
PR	OJECT	LOCAT	ION: F	Rome, Georgia										
ELE	EVATIO	N: 589.	70 fe	et	BORING STAR	TED	: 10/	2/2	012		RIG TYPE:CME-5	50	AUGER	DIA. (IN): 6¼
DRI	ILLING	METHO	D: Ho	ollow Stem Augers	BORING COMPLETED: 10/2/2012 HAMMER: Automatic									
	OUNDV 17 feet 8.05 fe	WATER: t ATD eet on 10	0/3/12	2	Remarks: 1	Mor Elev	hitoring vation ir	wel N	l set AVE	at : 88 0	38.5 feet below gr 3.	ound si	urface	
G	ELEV (FT.)	.DEPTH (FT.)		MATERIAL DESCR	RIPTION		LS	R	М	PI	STANDARD P RESISTA 0 10 20	ENETR ANCE (N 30 40	ATION N) 50 60 70 80	BLOWS/6"
	589.7 -	- 0	-	SILTY CLAY (CH), red-b (previously vacuum exca backfilled for undergrour clearance)	rown, wet wated and od utility	FILL								
<u>7</u>	579.7	- 10	10'	SILTY CLAY (CL-CH) wi sandstone fragments an orange and yellow-brown moist, very soft to very s	th red-gray d trace sand, n, damp to tiff	ALLUVIUM					•	●27 ●25		0 - 0 - 1 <b>(1)</b> 17 - 15 - 12 <b>(27)</b> 11 - 11 - 14 <b>(25)</b>
	563.7 ⁻ 559.7 ⁻		30'	SILTY CLAY-CLAYEY S with abundant small san fragments, yellow-brown to wet, stiff CLAYEY SILT (ML) with	ILT (CL-ML) dstone and red, moist  weathered	RESI					•15 •14			6 - 7 - 8 <b>(15)</b> 2 - 5 - 9 <b>(14)</b>
	553.6 551.2		36.1'-	shale fragments, light or moist to damp, stiff SANDY SILTY CLAY (C fragments, yellow-brown damp, very stiff Boring terminated at 38	L) with shale and red, .5 feet	DUUM						22		7 - 10 - 12 <b>(22)</b>
		  - 50 -												



### WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY					
DRILLED BY: Chad Odom (S	ME) LOGGED BY: PAT GRIBBEN (S&ME)				
RIG TYPE: CME-550 DRILLING METHOD: 4.25" HOLLOW STEM AUGERS					
DATE CONSTRUCTED: Octob					
		DEPTH	ELEVATION		
		FEET	FEET		
Locking Hinged Top					
0 0 1		1			
		1			
	TOP OF RISER	2.74	592.14		
1/4-inch Vent	Cap Type: Plastic Locking	1			
	<b>1</b> ▶    <b> </b>	1			
1/4-inch Weep Hole		0.2	589 70		
	TOP OF NAIL	0.5	505.70		
4-ft x 4-ft concrete pad	GROUND SURFACE	0.0	589.40		
		1			
× * * * * * * * * * * * * * * * * * * *	PROTECTIVE CASING	1			
\$ \$ \$	SIZE: 4" x 4" x 5	I			
	TYPE: STAINLESS STEEL LOCKING	1			
		_1 8	587.60		
	BOTTOWI OF PROTECTIVE CASING	-1.0			
	A BACKFILL MATERIAL	1			
	TYPE: Portland Cement Grout	1			
time of completion17.0 feet	AMOUNT: 37.5 gallons	1			
		1			
	RISER CASING	1			
	DIA: 2-inch	1			
Delayed water level -8.05 feet	TYPE: Schedule 40 PVC	1			
Date and time: $10/3/12$	JOINT TYPE: Flush Threaded	1			
		_19/	571.00		
		-10.4			
	TYPE: 3/8-inch coated bentonite pellets	I			
	5-gal buckets	1			
	AMOUNT: 50 lbs	I			
	PLACEMENT: 5.7 feet	I			
	TOP OF FILTER PACK	-24.1	565.30		
	FILTER PACK	I			
	TYPE: DSI Sand - 1A (20/30)	I			
	Drillers Services, Inc.	I			
	AMOUNT: 5.5 Dags	1			
	PLACEIVIENT. 14.5 leet	I			
	BOTTOM OF RISER/TOP OF SCREEN	-28.0	561.40		
	SCREEN (10.0')				
	DIA: 2-inch	I			
	TYPE: Schedule 40 PVC Prepack	I			
	OPENING WIDTH: 0.01-inch	1			
	OPENING TYPE: Slotted	1			
	SLOT SPACING: 0.25-inch	1	1		
	SLOT LENGTH: 1.5-inch	20.0	551.40		
Eluch threaded and can	BOITOM OF SCREEN	-38.0			
(0.4')		-28 /	551.00		
		50.4	551.00		
		1	1		
	HOLE DIA: 6.75"	1	1		



PROJECT: Plant Hammond Ash Pond #4 Well Installation			JOB NO: 1811-12-153 SHEET 1 OF 1		SHEET 1 OF 1
PROJECT LOCATION: Rome, Georgia					
ELEVATION: 588.37 feet	BORING START	ED: 8/22/2	2012	RIG TYPE:CME-5	50 AUGER DIA. (IN): 6.75
DRILLING METHOD: Hollow-Stem Augers	BORING COMPL	BORING COMPLETED: 8/22/2012		HAMMER: Automatic	
GROUNDWATER:	Remarks: M E	Aonitoring we	ell set at 2 NAVD 88	27.0 feet below gro 3.	ound surface
G ELEV DEPTH MATERIA	_ DESCRIPTION	L S F	R M PI	STANDARD P RESISTA 0 10 20	ENETRATION NCE (N) BLOWS/6" 30 40 50 60 70 80 90100
588.3       0       0.2'       TOPSOIL (brow SILTY CLAY (C cobbles         584.8       5       -       6'       SILTY CLAY (C rounded pebble moist, stiff         582.3       -       6'       SILTY CLAY (C dark gray dolorn siltstone fragme         573.8       -       14.5'       SANDY CLAY (C dark gray dolorn siltstone fragme         572.7       -       15.6'       sandstone fragme         572.3       -       -       16'       Lenses of weath weathered cher         568.0       -       20       20.3'       CLAYEY SILT ( and scattered cher         564.3       -       -       24'       CLAYEY SILT ( and scattered cher         561.3       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -	h), roots, grass ) with large limestone ) with scattered , brown, damp to 1) with hard weathered te and yellow-brown hts, wet, very stiff CH) with scattered ents, brown, wet, hard ered shale and gray, hard CH) with scattered hts, brown, wet, very AL) with trace mica ert fragments, et, very stiff AND (SC) with trace wn, wet, stiff ed at 27 feet	FILL ALLUVIUM			2 - 3 - 6 (9) 2 - 3 - 6 (9) 12 - 14 - 15 (29) 70 17 - 33 - 37 (70) 8 - 8 - 9 (17) 3 - 4 - 5 (9)
50					



### WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY					
DRILLED BY: Chad Odom (S&ME) LOGGED BY: PAT GRIBBEN (S&ME)					
RIG TYPE:	RIG TYPE: CME-550 DRILLING METHOD: 4.25" HOLLOW STEM AU				
DATE CONSTRU	2012				
			DEPTH	ELEVATION	
			FEET	FEET	
Locking Hinged To	p →				
	-				
		TOP OF RISER	3.52	591.56	
1/4-inch Vent		Cap Type: Plastic Locking			
		Elevation in NAVD 88.			
1/4-inch Weep Ho	le		0.22	588.37	
		TOP OF NAIL	0.55	599.04	
4-ft x 4-ft concrete	pad	GROUND SURFACE	0.0	588.04	
		SSS PROTECTIVE CASING			
		STAINLESS STELL LOCKING			
	). 	BOTTOM OF PROTECTIVE CASING	-1.15	586.89	
		BACKFILL MATERIAL			
Water Level @		TYPE: Portland Cement Grout			
time of completion	-6 feet	AMOUNT: 25 gallons			
time of completion					
		RISER CASING			
Delaurationation	-1 N/A	DIA: 2-inch			
Delayed water leve		I YPE: Schedule 40 PVC			
Date and time.		JOINT TTPE. Flush Threaded			
		TOP OF SEAL	-5.0	583.04	
		ANNULAR SEAL			
		TYPE: 3/8-inch coated bentonite pellets			
		5-gal buckets			
		AMOUNT: 50 lbs			
		PLACEMENT: 11.6 feet	44.6	E 72 44	
		TOP OF FILTER PACK	-14.6	575.44	
		-TYPE: DSI Sand = 1A(20/30)			
		Drillers Services Inc			
		AMOUNT: 5			
		PLACEMENT: 12.4 feet			
		BOTTOM OF RISER/TOP OF SCREEN	-16.6	571.44	
		SCREEN (10.0')			
		DIA: 2-inch			
		OPENING WIDTH: 0.01 inch			
		OPENING TYPE: Slotted			
1		SLOT SPACING: 0.25-inch			
1		SLOT LENGTH: 1.5-inch			
		BOTTOM OF SCREEN	-26.6	561.44	
Flush-threaded en	d cap 🛛 🗕 🕨				
( 0.4' )		BOTTOM OF CASING	-27.0	561.04	
		DIA: 6.75"			
1	HOL			1	
L					


## **BORING NO.: GWA-16**

PROJECT: Plant Hammond Ash Pond #4 Well Installation       JOB NO: 1811-12-153       SHEET 1 OF 1								1									
PROJECT LOCATION: Rome, Georgia																	
ELE	VATIO	N: 579.	58 fee	et	ВС	DRING STAR	TED	: 8	3/21	/20	12		RIG TYPE:CME-5	50	AUG	GER D	IA. (IN): 6.7
DRIL	LING I	ИЕТНО	D: Ho	llow-Stem Augers	В	ORING COMP	PLET	ED: 8	3/21	/20	12		HAMMER: Autom	atic			
GROUNDWATER:				Remarks:	Mon Elev	itorir vatio	ng w	vell NA	set AVE	at ⁻ 0 88	19.7 feet below gr 3.	ound s	urface	e			
G	ELEV. (FT.)	DEPTH (FT.)		MATERIAL DESC	RIPT	TION		L	s	R	М	ΡI	STANDARD F RESIST/ 0 10 20	ENETF ANCE (1 30 40	RATIOI N) 50 60 70	N 0 80 901	BLOWS/6"
Z	579.5 576.0 575.0 569.3 564.2 559.5 557.0		0.3' \ 3.5' 4.5' \ 10.2' - 20.6' \ 20.6' \	TOPSOIL (dark brown) SILTY CLAY (CH), orar brown, damp SAND (SP), well graded SILTY CLAY (CH), yell very soft SANDY CLAYEY SILT mica, yellow-brown and damp, very stiff to stiff CLAYEY FINE SAND ( mica and scattered rou yellow-brown and brow SAND (SP) with rounde graded, coarse, gray, w COAL, black, shiny, thi fissile, trace pyrite, hard <i>Boring terminated at 2.</i>	, roo nge-l d, we ow-b (ML) I ligh SC) n de cet, v ad pe vet, v 2.5 f	ts, grass / brown to et/ rown, wet, ) with trace t blue-gray, with trace d pebbles, et, loose ebbles, well /ery dense aminated	FILL ALLUVIUM BED-ROCI							23	•55		<ul> <li>1 - 1 - 1 (2)</li> <li>7 - 10 - 13 (23)</li> <li>5 - 6 - 5 (11)</li> <li>7 - 21 - 34 (55)</li> </ul>
		- 50															

## GEORGIA POWER PLANT HAMMOND ASH POND #4 ROME, GEORGIA



## WELL CONSTRUCTION LOG

CLIENT:	SOUTHERN CO	MPANY			WELL ID:
DRILLED BY:	Chad Odom (S8	kME)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE:	CME-550		DRILLING METHOD: 4.25" HOLLOW STEN	1 AUGERS	GWA-16
DATE CONSTRU	CTED: August	21, 2012			
				DEPTH	ELEVATION
				FEET	FFFT
La altina Llina ad Tara	<b>&gt;</b>				
Locking Hinged Top					
				2 21	582.55
1/A in the Mart			Con Tymes Plastic Locking	5.51	
1/4-inch vent			Cap Type: Plastic Locking		
1/4 inch Woon Hold					
1/4-incli weep hole				0 34	579.58
A ft A ft				0.0	579 24
4-ft x 4-ft concrete	pad <u> </u>		GROUND SURFACE	0.0	575.24
			§/ 🔪		
			SIZE: 4 th x 4 th x 5 th		
			TYPE: STAINLESS STEEL LOCKING		
				NLA	Not available
	**		BUTTOM OF PROTECTIVE CASING	NA	NOL available
			TYPE: Dertland Coment Crout		
Water Level @	-3 5 foot				
time of completion:	-5.5 leet		AMOUNT: 25 galloris		
			DIA: 2-inch		
Delayed water leve	I N/A		TYPE: Schedule 40 PVC		
Date and time	N/A		IOINT TYPE: Flush Threaded		
Dute and time.			Joint III E. Hash III Cadea		
			TOP OF SEAL	-4.7	574.54
			ANNULAR SEAL	,	
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 2.5 feet		
			TOP OF FILTER PACK	-7.2	572.04
			FILTER PACK		
			TYPE: DSI Sand - 1A (20/30)		
			Drillers Services, Inc.		
			AMOUNT: 5.5 bags		
			PLACEMENT: 12.5 feet		
			BOTTOM OF RISER/TOP OF SCREEN	-9.3	569.94
			SCREEN (10.0')		
			DIA: 2-inch		
			TYPE: Schedule 40 PVC Prepack		
			OPENING WIDTH: 0.01-inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch	10.0	559 91
			BOTTOM OF SCREEN	-19.3	559.94
Flush-threaded end	сар ———			107	
( 0.4' )			BOTTOM OF CASING	-19./	559.54
			6 75"		
		HULE DIA:	0.75		
L					

Elevation in NAVD 88.



### **BORING NO.: GWC-19**

## TEST BORING RECORD



## GEORGIA POWER PLANT HAMMOND ASH POND #4 ROME, GEORGIA



## WELL CONSTRUCTION LOG

CLIENT: SOUTHERN COMPANY					WELL ID:
DRILLED BY: C	Chad Odom (S8	kme)	LOGGED BY: PAT GRIBBEN (S&ME)		
RIG TYPE: 0	CME-55		DRILLING METHOD: 4.25" HOLLOW STEM	AUGERS	GWC-19
DATE CONSTRUC	TED: August	: 14, 2012			
				DEPTH	ELEVATION
				FEET	FEET
Locking Hinged Top					
					570.00
			TOP OF RISER	4.29	579.83
1/4-inch Vent 🗕			Cap Type: Plastic Locking		
4 / 4 in the Min and Mala					
1/4-inch Weep Hole	$\rightarrow$			1 36	576.90
A ft v A ft concrete o	ad			1.50	575.54
4-ft x 4-ft concrete p	ad <u></u>		GROUND SURFACE	0.0	575.54
	******* ******				
			TYPE: STAINIESS STEELLOCKING		
	**************************************				
	le s	4	BOTTOM OF PROTECTIVE CASING	-1.25	574.29
			BACKFILL MATERIAL		
Water Level @			TYPE: Portland Cement Grout		
time of completion:	-7 feet		AMOUNT: 45 gallons		
			RISER CASING		
Delayed water level	-9.85 foot		DIA. 2-IIICII TYPE: Schedule 40 DVC		
Date and time:	8/16/12		IOINT TYPE: Flush Threaded		
Bute and time.	0/10/11		Joint III Ei Hasin III educa		
			TOP OF SEAL	-15.0	560.54
			ANNULAR SEAL		
			TYPE: 3/8-inch coated bentonite pellets		
			5-gal buckets		
			AMOUNT: 50 lbs		
			PLACEMENT: 3.5 feet	10 F	557.04
				-18.5	557.04
			TYPE: DSI Sand - 14 (20/30)		
			Drillers Services. Inc.		
			AMOUNT: 3.5 bags		
			PLACEMENT: 13.4 feet		
			BOTTOM OF RISER/TOP OF SCREEN	-21.5	554.04
			SCREEN (10.0')		
			DIA: 2-inch		
			OPENING WIDTH: 0.01 inch		
			OPENING TYPE: Slotted		
			SLOT SPACING: 0.25-inch		
			SLOT LENGTH: 1.5-inch		
			BOTTOM OF SCREEN	-31.5	544.04
Flush-threaded end	сар	<b></b>			
( 0.4' )			BOTTOM OF CASING	-31.9	543.64
		HULE DIA:	0./0		
					1

Elevation in NAVD 88.

# CERTIFIED WELL NETWORK SURVEY DATA



Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail on Pad Northing	Nail on Pad Easting	Nail on Pad Elevation
GWA-14	1548982.5890	1936642.5820	592.14	1548981.4550	1936642.2230	589.70
GWA-15	1548766.1700	1936808.4740	591.56	1548765.2100	1936807.8670	588.37
GWA-16	1548592.7400	1937210.9880	582.55	1548592.0540	1937209.9470	579.58
GWC-19	1547892.8940	1936572.9730	579.83	1547893.7790	1936572.0390	576.90
GWC-4	1547898.3050	1935398.6960	580.65	1547899.6900	1935398.5510	577.73
GWC-6	1547843.9320	1934800.4510	581.63	1547845.1020	1934800.3890	578.55
GWC-8	1548167.1270	1934342.9370	579.99	1548167.2960	1934344.1910	577.13
HGWA-111	1548834.2570	1935222.8050	591.75	1548833.1050	1935222.9840	588.79
HGWA-112	1548885.6280	1935646.9960	596.27	1548884.5350	1935647.2640	593.46
HGWA-113	1548944.6240	1935990.0870	594.58	1548943.4750	1935990.3010	592.07
HGWC-101	1547725.4970	1936369.5810	578.85	1547726.4760	1936369.0200	575.91
HGWC-102	1547713.5040	1936033.3300	577.54	1547714.8560	1936033.7180	574.54
HGWC-103	1547848.8830	1935732.9610	580.79	1547850.1990	1935733.3030	577.76
HGWC-105	1547855.5570	1935110.3560	582.09	1547856.9860	1935110.3600	579.08
HGWC-107	1547909.9900	1934442.2410	579.31	1547911.2040	1934442.9490	576.43
HGWC-109	1548627.4120	1934362.7670	576.77	1548627.0470	1934361.5230	573.66
HGWC-117	1548100.7710	1937180.4260	581.98	1548099.5300	1937180.3100	579.31
HGWC-118	1547980.5610	1936946.3660	579.02	1547981.8380	1936946.8290	576.52
MW-12	1547853.7790	1937525.4620	583.27	1547855.2080	1937525.2430	580.59

Benchmark	Northing	Easting	Elevation
BM H-1	1547964.9650	1937219.0690	579.02

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING.

DATE OF FIELD SURVEY & INSPECTION: 05/04/2020-05/06/2020.

FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD'88 EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARK BM H-1 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL.





5/11/2020

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail on Pad Northing	Nail on Pad Easting	Nail on Pad Elevation
HGWA-42D	1549363.7180	1938443.8590	586.17	1549362.3140	1938444.3210	583.39
HGWA-43D	1550422.8480	1940753.8050	595.08	1550422.8120	1940754.9980	592.08
HGWA-44D	1550409.1260	1940756.1850	594.79	1550409.2230	1940757.6150	592.01
HGWA-45D	1551157.6780	1941907.5370	586.95	1551159.2250	1941907.4670	584.08
MW-46D	1551056.4780	1942929.1010	605.72	1551055.9530	1942927.8210	603.17
HGWA-47	1548990.9600	1934171.8440	580.33	1548989.2780	1934171.6440	577.39
HGWA-48D	1548989.3900	1934178.1460	580.26	1548988.1150	1934177.8070	577.29

Benchmark	Northing	Easting	Elevation
BM H-1	1547964.9650	1937219.0690	579.02
BM H-2	1548149.4490	1938960.2220	590.68
BM H-4	1549952.4470	1941611.3640	585.71

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING. DATE OF FIELD SURVEY & INSPECTION: 09/01/2020-09/02/2020. FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD'88. EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARKS BM H-1, BM-H2 & BM-H4 SET BY GEL SOLUTIONS DURING PREVIOUS SURVEYS USING A TRIMBLE DINI LEVEL



In RIL

9/10/2020

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail or Pad Northing	Nail or Pad Easting	Nail or Pad Elevation	Description
HGWC-117A	1548082.038	1937157.249	581.759	1548080.943	1937157.918	578.849	NAIL ON PAD
							NAIL ON
MW-51	1547872.352	1938421.463	574.541	1547873.517	1938421.451	571.573	PAD
Benchmark	Northing	Easting	Elevation				
BM-H2	1548149.4490	1938960.2220	590.68				
BM-H1	1547964.965	1937219.069	579.02				

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING. DATE OF FIELD SURVEY & INSPECTION: 09/07/2021. FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD '88. EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARKS BM-H1 AND BM-H2 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL

Durk Balk

9/8/2021



COA - LS003119 Exp. 06/30/2022

# PERFORMANCE BOND FOR DRILLERS



C *74*06/11/12*CA 3419896-11





Administrative Offices 301 E 4th Street

#### GREAT AMERICAN INSURANCE COMPANY

An Ohio Corporation with Administrative Office at 301 E 4th Street, Cincinnati, Ohio 45202-4201

Certificate Continuing In Force Bond No. CA 341 98 96 - 11

Name of Principal: S&ME, INC. SPARTANBURG, SC

DIRECTOR THE ENVIRONMENTAL PROTECTION DIVISION Name of Obligee: DEPT. OF NATURAL RESOURCES, STATE OF GEORGIA

\$10,000.00 Premium: \$125.00 Amount of Bond:

The GREAT AMERICAN INSURANCE COMPANY in consideration of the premium, does hereby continue in force the above described bond from the 30TH 30TH day of JUNE, 2013 day of JUNE, 2012 , to the standard time at the obligee's address; but this certificate shall not be binding upon the said Company until countersigned by a duly authorized representative of the said Company.

This certificate is issued upon the condition that the liability of the GREAT AMERICAN INSURANCE COMPANY shall under no circumstances be cumulative in amounts from year to year, regardless of the number of years said bond be continued in force and the number of premiums that may be paid or payable.

GREAT AMERICAN INSURANCE COMPANY

Attorn6y/in-fact Robert G. Salmon, Jr

F.9160C (Ed. 03/83) PRO

(Page 1 of 1)

### **GREAT AMERICAN INSURANCE COMPANY®**

Administrative Office: 301 E 4TH STREET . CINCINNATI, OHIO 45202 . 513-369-5000 . FAX 513-723-2740

The number of persons authorized by this power of attorney is not more than THREE

#### POWER OF ATTORNEY

No. 0 20267

KNOW ALL MEN BY THESE PRESENTS: That the GREAT AMERICAN INSURANCE COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Ohio, does hereby nominate, constitute and appoint the person or persons named below, each individually if more than one is named, its true and lawful attorney-in-fact, for it and in its name, place and stead to execute on behalf of the said Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; provided that the liability of the said Company on any such bond, undertaking or contract of suretyship executed under this authority shall not exceed the limit stated below.

	Name	Address	Limit of Power
JAMES W. POOLE		ALL OF	ALL
ROBERT G. SALMON, JR.		RALEIGH, NORTH CAROLINA	\$75,000,000.
DAVID J. BRASWELL			

This Power of Attorney revokes all previous powers issued on behalf of the attorney(s)-in-fact named above. IN WITNESS WHEREOF the GREAT AMERICAN INSURANCE COMPANY has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this 26TH day of MARCH 2012 GREAT AMERICAN INSURANCE COMPANY Attest

Assistant Secretary

STATE OF OHIO, COUNTY OF HAMILTON - ss: 26TH

Divisional Senior Vice President

DAVID C. KITCHIN (877-377-2405)

On this day of MARCH 2012 , before me personally appeared DAVID C. KITCHIN, to me known, being duly sworn, deposes and says that he resides in Cincinnati, Ohio, that he is a Divisional Senior Vice President of the Bond Division of Great American Insurance Company, the Company described in and which executed the above instrument; that he knows the seal of the said Company; that the seal affixed to the said instrument is such corporate seal; that it was so affixed by authority of his office under the By-Laws of said Company, and that he signed his name thereto by like authority.



KAREN L. GROSHEIM NOTARY PUBLIC, STATE OF OHIO MY COMMISSION EXPIRES 02-20-16

Iran R. Grochim

This Power of Attorney is granted by authority of the following resolutions adopted by the Board of Directors of Great American Insurance Company by unanimous written consent dated June 9, 2008.

RESOLVED: That the Divisional President, the several Divisional Senior Vice Presidents, Divisional Vice Presidents and Divisonal Assistant Vice Presidents, or any one of them, be and hereby is authorized, from time to time, to appoint one or more Attorneys-in-Fact to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time.

RESOLVED FURTHER: That the Company seal and the signature of any of the aforesaid officers and any Secretary or Assistant Secretary of the Company may be affixed by facsimile to any power of attorney or certificate of either given for the execution of any bond, undertaking, contract of suretyship, or other written obligation in the nature thereof, such signature and seal when 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.

#### CERTIFICATION

I, STEPHEN C. BERAHA, Assistant Secretary of Great American Insurance Company, do hereby certify that the foregoing Power of Attorney and the Resolutions of the Board of Directors of June 9, 2008 have not been revoked and are now in full force and effect.

Signed and sealed this

23rd

August

day of

2013



Alton C.

Assistant Secretary

S1029AC (4/11)

## CONTINUATION CERTIFICATE

#### **SAFECO Insurance Company of America**

, Surety upon

a certain Bond No.	4993104
dated effective	<b>June 30, 1987</b> (MONTH-DAY-YEAR)
on behalf of	Southern Company Services, Inc. (PRINCIPAL)
and in favor of	Georgia - Dept. of Natural Resources
	(OBLIGEE)
does hereby continue said	bond in force for the further period
beginning on	<b>June 30, 2014</b> (MONTH-DAY-YEAR)
and ending on	June 30, 2015 (MONTH-DAY-YEAR)
Amount of bond	\$10,000.00
Description of bond	Water Well Contractors & Drillers
Premium:	\$100.00

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

Signed and dated on	April 09, 2014 (MONTH-DAY-YEAR)	
	SAFECO Insurance Company of America	
	D-Ann Kleidosty, Attorney-In-Fact	

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND. This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Certificate No. 6125754 First National Insurance Company of America General Insurance Company of America Safeco Insurance Company of America **POWER OF ATTORNEY** KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chaun M. Wilson; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; Tracey D. Watson; William G. Moody all of the city of Atlanta , state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons. IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th 2013 _day of May CE CON ANCS E COM First National Insurance Company of America To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day. 19281923 1953 General Insurance Company of America Safeco Insurance Company of America h Quepe Gregory W. Davenport, Assistant Secretary interest rate or residual value guarantees. STATE OF WASHINGTON SS COUNTY OF KING Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guar On this 15th day of May 2013, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written. LO RILES ONM ET By: KDRiley, Notary Rublic NOTARY This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows: ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority. Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and biding upon the Company with the same force and effect as though manually affixed. I, David M. Carey, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked. day of <u>April</u>, 20 <u>M</u>. By: <u>April 7. Cany</u> IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 944 COL David M. Carev. Assistant Secretary

POA - FNICA, GICA & SICA LMS_12874_041012 - 3 Company CONTINUATION CERTIFICATE

Atlantic Specialty	Insurance Company	, Surcty upon
a certain Bond No. 800033976		Issued on 9/27/2017
dated effective 09/27/2017 (MONTH-DAY-YEAR)		Expires on 6/30/2019 Renewed on 3/4/2019 Expires on 6/30/2021
on behalf of	Ricky Davis / Cascade Drilling, L.P. (PRINCIPAL)	
and in favor of	Department of Natural Resources, State of G (OBLIGEE)	ieorgia
does hereby continue sa	aid 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 Contra	actors
Premium:	\$1200.00	
PROVIDED: That the provision that the Su not be cumulative an account of all default shall not in any event	his continuation certificate does not create a new ob prety's liability under said bond and this and all Cont d that the said Surety's aggregate liability under said ts committed during the period (regardless of the nu t exceed the amount of said bond as hereinbefore set for	ligation and is executed upon the express condition an tinuation Certificates issued in connection therewith sha d bond and this and all such Continuation Certificates o mber of years) said bond had been and shall be in forc orth.
Signed and dated on	March 4th, 2019 (MONTH-DAY-YEAR)	
CEAL Structures	Atlantic Specialty Insurance Company By Attorney-in-Fact Andrew P. Larsen Parker, Smith & Feek, Inc. Agent 2233 112th Ave NE Bellevue, WA 9800	4
	Address of Agent 425-709-3600 Telephone Number of Agent	
-0157/GE 8/08		

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#### CONTINUATION CERTIFICATE

SAFECO Insurance	e Company of America , Su	arety upon		
a certain Bond No.	4993104			
dated effective	June 30, 1987 (MONTH-DAY-YEAR)			
on behalf of	Southern Company Services, Inc. (PRINCIPAL)			
and in favor of	Georgia Department of Natural Resources, Environmental Protection Division (OBLIGEE)			
does hereby continue	said bond in force for the further period			
beginning on	June 30, 2021 (MONTH-DAY-YEAR)			
and ending on	June 30, 2022 (MONTH-DAY-YEAR)			
Amount of bond	Fifteen Thousand Dollars and 00/100 (\$15,000.00)			
Description of bond	Water Well Contractors & Drillers			
Premium:	\$100.00			
<b>PROVIDED:</b> 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	(MONTH-DAY-YEAR) SAFECO Insurance Company of America			
	175 Berkeley Street, Boston, MA 02116			
	Be Attorney In-Fact Jeffrey M. Wilson, Attorney-in-Fact			
	McGriff Insurance Services, Inc.			
193	2211 7th Avenue South, Birmingham, AL 35233			
E.F.	Address of Agent			
	Telephone Number of Agent			



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This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

> American States Insurance Company First National Insurance Company of America General Insurance Company of America Safeco Insurance Company of America

Certificate No: 8205019-016032

(POA) verification inquiries, HOSUR@libertymutual.com

Attorney or email |

First National Insurance Company of America General Insurance Company of America

#### POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Freel; Sam Audia; William M. Smith

each individually if there be more than one named, its true and lawful attorney-in-fact to make, all of the city of state of Aĩ Birmingham execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed , 2021 thereto this 11th day of March American States Insurance Company



This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney. shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-infact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surely any and all undertakings, bonds, recognizances and other surely obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this day of 6th May



#### CONTINUATION CERTIFICATE

SAFECO Insurance	Company of America	, Surety upon
a certain Bond No.	4993104	
dated effective	June 30, 1987 (MONTH-DAY-YEAR)	
on behalf of	Southern Company Services, Inc. (PRINCIPAL)	
and in favor of	Georgia Department of Natural Resources, Environmental Protection Division (OBLIGEE)	
does hereby continue	said bond in force for the further period	
beginning on	June 30, 2022 (MONTH-DAY-YEAR)	
and ending on	June 30, 2023 (MONTH-DAY-YEAR)	
Amount of bond	Fifteen Thousand Dollars and 00/100 (\$15,000.00)	
Description of bond	Water Well Contractors & Drillers	
Premium:	\$100.00	
PROVIDED: That is provision that the S not be cumulative a account of all defau shall not in any even Signed and dated on	this continuation certificate does not create a new obligation and is executed upon urety's liability under said bond and this and all Continuation Certificates issued in nd that the said Surety's aggregate liability under said bond and this and all such Ce lts committed during the period (regardless of the number of years) said bond had at exceed the amount of said bond as hereinbefore set forth. <u>05/06/2021</u> (MONTH-DAY-YEAR) SAFECO Insurance Company of America	the express condition and connection therewith shall ontinuation Certificates on been and shall be in force,
	175 Berkeley Street, Boston, MA 02116 By Attorney-in-Fact leffrey M. Wilson, Attorney-in-Fact McGriff Insurance Services, Inc. Agent 2211-7th Avenue South, Birmingham, AL 35233 Address of Agent	
N N	(205) 252-9874 Telephone Number of Agent	



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Attorney or email |

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each individually if there be more than one named, its true and lawful attorney-in-fact to make, all of the city of state of Aĩ Birmingham execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed , 2021 thereto this 11th day of March American States Insurance Company



This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney. shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-infact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surely any and all undertakings, bonds, recognizances and other surely obligations.

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I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this day of 6th May



## B. GROUNDWATER MONITORING WELL DETAIL



## C. GROUNDWATER SAMPLING PROCEDURE

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

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

- 1. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations and notify Georgia Power if it appears that the well has been compromised.
- 2. Measure and record the depth to water in all wells to be sampled prior to purging using a water measuring device consisting of probe and measuring tape capable of measuring water levels with accuracy to 0.01 foot. Static water levels will be measured from each well, within a 24-hour period. The water level measuring device will be decontaminated prior to lowering in each well.
- 3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. All non-dedicated pumps and wiring will be decontaminated before use and between well locations in general accordance with USEPA Region 4 SESD guidance document, *Operating Procedure Field Equipment Cleaning and Decontamination* (EPA, SESDGUID-205-R3), or the latest version of the document.
- 4. Measure Water Level: Immediately prior to purging, measure the water level again with the pump in the well. Leave the water level measuring device in the well.
- 5. Purge Well: Begin pumping the well at approximately 100 to 500 milliliters per minute (mL/min). Monitor the water level continually. Maintain a steady flow rate that results in a stabilized water level with 0.3 feet or less of variability. Avoid entraining air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.
- 6. Monitor Indicator Parameters: Monitor and record the field indicator parameters [turbidity, temperature, specific conductance, pH, oxidation-reduction potential (ORP), and dissolved oxygen (DO)] approximately every three to five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:

±0.1 for pH

±5% for specific conductance (conductivity)

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

<5 NTU for turbidity

Temperature - Record only, not used for stabilization criteria

ORP – Record only, not used for stabilization criteria.

- 7. Collect samples at a 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 (i.e., >10 NTU), duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. A new filter must be used for each well and each sampling event. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity. Additional details related to managing for elevated turbidity is discussed below.
- 9. All sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.
- 10. Sample containers and preservative will be appropriate for the analytical method being used.
- 11. Information contained on sample container labels will include:
  - a. Name of facility
  - b. Date and time of sampling
  - c. Sample description (well number)
  - d. Sampler's initials
  - e. Preservatives
  - f. Analytical method(s)
- 12. After samples are collected, samplers will remove all non-dedicated equipment. Upon completion of all activity the well will be closed and locked.

13. Samples will be delivered to the laboratory following appropriate COC and temperature control requirements. The goal for sample delivery will be within 48 hours of collection.

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

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

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

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

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