GROUNDWATER MONITORING PLAN

PLANT BOWEN COAL COMBUSTION RESIDUALS (CCR) LANDFILL

BARTOW COUNTY, GEORGIA

FOR





September 2022





WSP USA Environment & Infrastructure, Inc. 1075 Big Shanty Road, Suite 100 Kennesaw, Georgia 30144

TABLE OF CONTENTS

I.	CERTIFICATION	. 1
1.	INTRODUCTION	.2
2.	GEOLOGIC AND HYDROGEOLOGIC CONDITIONS	. 3
2.1	REGIONAL GEOLOGY	. 3
2.2	SITE GEOLOGY	. 3
2.3	SITE HYDROGEOLOGY	.4
3.	SELECTION OF WELL LOCATIONS	. 6
4.	MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING	7
4.1	DRILLING	.7
4.2	DESIGN AND CONSTRUCTION	.7
4.3	WELL ABANDONMENT	10
4.4	DOCUMENTATION	10
5.	GROUNDWATER MONITORING PARAMETERS AND FREQUENCY	12
6.	SAMPLE COLLECTION	16
7.	CHAIN-OF-CUSTODY	17
8.	FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL	18
9.	REPORTING RESULTS	19
10.	STATISTICAL ANALYSIS	21
11.	REFERENCES	23

LIST OF TABLES

Table 1	Groundwater Flow Velocities for July 2021
Table 2	Groundwater Monitoring Parameters & Frequency
Table 3	Analytical Methods

LIST OF FIGURES

- Figure 1 Statistical Analysis Plan Overview
- Figure 2 Decision Logic for Determining Appropriate Statistical Method
- Figure 3 Decision Logic for Computing Intrawell Prediction Limits
- Figure 4 Decision Logic for Computing Interwell Prediction Limits

TABLE OF CONTENTS - CONTINUED

LIST OF APPENDICES

Appendix A Groundwater Monitoring Network Documentation

- Table A1
 Summary of Well Installation Dates, Coordinates, Elevation Screen Interval and Purpose
- Figure A1 Monitoring Well Network
- Figure A2
 Potentiometric Surface Overburden Wells July 2021
- Figure A3 Potentiometric Surface Bedrock Wells July 2021
- Attachment A1 Well Construction and Boring Logs
- Attachment A2 Well Drilling Contractor Proof of Bonding
- Attachment A3 Surveyor's Certification
- Appendix B Groundwater Monitoring Well Details
- Appendix C Groundwater Sampling Procedures
- Appendix D Surface Water Sampling and Analysis Procedures

Groundwater Monitoring Plan Georgia Power Company Plant Bowen CCR Landfill September 2022 WSP USA Project No. 6122160287

CERTIFICATION 1.

I hereby certify that this Groundwater Monitoring Plan was prepared by, or under the direct supervision of, a "Qualified Groundwater Scientist," in accordance with the Rules of Solid Waste Management and 40 CFR Part 258.50(g). 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 postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action." The design of the groundwater monitoring system was developed in compliance with the Georgia Environmental Protection Division (Georgia EPD) Rules of Solid Waste Management, Chapter 391-3-4-.10(6).

Signature: Gregory J. Wronn, P.E. Associate Engineer

Date:

Georgia Registered Professional Engineer No. 025565



Sept. 28 702 Date: DEPARTMENT OF NATURAL RESOURCES **ENVIRONMENTAL PROTECTION DIVISION** Approved Solid Waste Management Program Approved By: _ Signature: Month um Rhonda N. Quinn, P.G. Senior Geologist Georgia Registered Professional Geologist No. 1031 September 28, 2022

1

1. INTRODUCTION

Groundwater and surface water monitoring is required by the Georgia Environmental Protection Division (Georgia EPD) to detect and quantify potential changes in groundwater chemistry. This Groundwater Monitoring Plan (plan) describes the groundwater and surface water monitoring program for the Site. This plan meets the requirements of Georgia EPD rules and uses Georgia EPD's Manual for Ground Water Monitoring dated September 1991 as a guide. Groundwater and surface water sampling locations are presented on Plant Bowen Solid Waste Disposal Facilities Monitoring Well Network for the Landfill Cells 1 & 2, 3 & 4, and 9 & 10 (Appendix A: Groundwater Monitoring Network Documentation).

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 the Permit or the Georgia EPD rules (391-3-4-.10), the Georgia EPD rules will take precedent.

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (§257.90), which is incorporated by Georgia State CCR Rule by reference, a detection monitoring well network for the Landfill has been installed and certified by a qualified professional engineer. This certification has been placed in the facility's operating record. 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 Georgia EPD prior to any unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist. The Plant Bowen Landfill Cells 1 & 2, 3 & 4, and 9 & 10 remain in detection monitoring and Georgia Power will continue routine groundwater monitoring.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic conditions for this Site are described in a report prepared by Southern Company Services Earth Science and Environmental Engineering titled *Combustion By-Products Storage Facility Site Acceptability Report* dated 2002, and *Plant Bowen Proposed Coal Combustion By-Product Monofill Addendum I Site Acceptability Report – Hydrogeological Assessment and Demonstration of Engineering Measures*, dated 2004.

The geology and hydrogeology of the Landfill Cells area is summarized below. The area is underlain by residuum clayey soils that transition into sedimentary bedrock. Karst terrain exists in the area. The uppermost aquifer is comprised of the terrace deposits and clayey soils and the upper fractured sedimentary bedrock with groundwater flow direction generally toward the Etowah River.

2.1 Regional Geology

The Plant Bowen Site lies within the Valley and Ridge physiographic province about three to four miles north of the Cartersville Fault. The Cartersville Fault separates the late Precambrian-aged metamorphic rocks to the east and south from the Cambrian-aged sedimentary rocks to the north and west.

The Site lies within an area mapped as Knox Group undifferentiated with a southwestern portion of the facility mapped as Newala Limestone in the work by Croft (1963). The Landfill Cells are located on the northeast portion of the Site (Figure A1: Monitoring Well Network).

2.2 Site Geology

The lithologies present in the landfill area of the Site from the ground surface to depth are Terrace Deposits, a residuum clay overburden, dolomite, and limestone bedrock.

The Knox Group produces a characteristic orange to red clayey residuum that ranges in thickness from 19 to 127 feet across the Plant Bowen Site and often contains weathered chert and dolomite fragments. Outcrops for geological mapping are rare and occur primarily in quarries and along streams. Terrace deposits (silt and clay with some gravel and sand) overlay the clayey residuum in some areas but are not continuous across the landfill area. The Terrace Deposits with the clayey residuum comprise the overburden.

The Knox Group dolomite consists predominantly of medium gray to medium dark gray, medium bedded to massive, fine to medium-grained rock. The Knox Group limestone was logged predominantly as light gray to medium light-gray, thin to medium-bedded, fine to medium-grained, argillaceous limestone. Some very occasional thin to medium beds of crystalline limestone or fine-grained calcareous sandstone were noted. The vigorous reaction to dilute hydrochloric acid was a major distinguishing feature between the limestone and dolomite. Fine-grained pyrite was noted in a few of the limestone core samples (SCS, 2002). Solution cavities are sometimes noted in the dolomite/limestone bedrock at the Site. These solution cavities are generally filled with residual clay and silt or may be open in some instances.

2.3 Site Hydrogeology

Two main geologic layers are present at the Site: overburden (residuum clay), and bedrock (dolomite and limestone). Overburden materials are very heterogeneous ranging in composition from well-graded gravelly sand to fat clay. The primary source of recharge for the uppermost aquifer is infiltration of rainfall. Bedrock underlying the Site (officially mapped as Knox undifferentiated) exhibits minor and discontinuous solution features within the underlying carbonate bedrock, which are predominately formed along initial discontinuities including joints, fractures, and bedding planes. To monitor the karst, 37 wells (17 overburden and 20 bedrock wells) are instrumented with pressure transducers to collect and record groundwater elevations multiple times daily from monitoring wells located around the perimeter of the landfill cells. The logged data are uploaded after each reading via satellite telemetry to a central database.

Rain-filled surface depressions are located between Cells 1 & 2 and Proposed Cells 5 to 8 and fluctuate in size depending upon rainfall. These depressions were present prior to the construction of the landfill and do not appear to have flowing water. A spring is located to the northeast of Cells 3 & 4 as shown on **Figure A1**. Water is present in the spring intermittently. The Etowah River to the west, north and east of the landfill cells, and the general service pond to the southwest of Cells 9 & 10 are present at the Site but outside of the landfill permit boundary.

General groundwater flow in the overburden in the Landfill area is to the north-northeast beneath Cells 1 & 2 and Cells 9 & 10 and to the west-northwest beneath Cells 3 & 4 (Figure A2: **Potentiometric Surface - Overburden Wells July 2021**). Groundwater flow direction in the bedrock is similar to the overburden, with flow to the north-northeast beneath Cells 1 & 2 and Cells 9 & 10 and to the west-northwest beneath Cells 3 & 4 (Figure A3: Potentiometric Surface – Bedrock Wells July 2021).

The difference in groundwater elevations between the overburden and upper bedrock were within a couple of feet in many well clusters across the landfill area. Continuous groundwater elevation monitoring data correlate with rainfall and river elevation data from the Site. These data suggest a direct groundwater communication between overburden and upper bedrock. The overburden and the upper fractured sedimentary bedrock comprise the uppermost aquifer beneath the landfill cells area. At a few locations around the landfill, particularly at areas of relatively higher elevations and at areas with relatively thinner overburden, the first groundwater is encountered in the upper fractured bedrock.

Horizontal groundwater flow rates in **July 2021** at the Site range from approximately 0.01 to 0.16 feet per day in the overburden and from approximately 0.03 to 0.38 feet per day in the upper bedrock (**Table 1: Groundwater Flow Velocities for July 2021**), based on horizontal hydraulic conductivity data reported in the *Plant Bowen Proposed Coal Combustion By-Product Storage Facility Site Acceptability Report* (SCS, 2002). The estimated groundwater flow rates are relatively low considering the karst topography at the Site.

TABLE 1 GROUNDWATER FLOW VELOCITIES FOR JULY 2021 Plant Bowen Landfill Cells 1 & 2, 3 & 4, and 9 & 10 Bartow County, Georgia

Flow Paths		Groundwater Elevations in Well Pairs (h ₁ , h ₂) (feet)		Change in Elevation (Δh) (feet)	Distance Measured (L) (feet)	Hydraulic Gradient (i) (feet/feet)	Average Hydraulic Conductivity (K) (feet/day)	Estimated Effective Porosity (n _e)	Calculated Groundwater Flow Velocity (V) (feet/day)	Calculated Groundwater Flow Velocity (V) (feet/year)
	Overburden GWC-5 to GWC-9	660.91	654.93	5.98	1302	0.005	0.072	0.01	0.03	10.95
	Overburden GWC-15 to GWC-14	656.73	655.82	0.91	325	0.003	0.072	0.01	0.02	7.30
Cells 1 & 2	Overburden GWA-50 to GWC-6	672.08	658.02	14.06	650	0.022	0.072	0.01	0.16	58.40
	Bedrock GWC-8RR to GWC-10R	657.00	655.07	1.93	600	0.003	0.36	0.01	0.12	43.80
	Bedrock GWA-1 to GWA-2R	658.39	655.45	2.94	350	0.008	0.36	0.01	0.30	109.50
	Overburden GWA-53 to GWC-18	654.01	649.31	4.70	1250	0.004	0.072	0.01	0.03	10.95
	Overburden GWA-37 to GWC-18	654.66	649.31	5.35	977	0.005	0.072	0.01	0.04	14.60
Cells 3 & 4	Bedrock GWA-53R to GWC-18R	653.96	649.45	4.51	1265	0.004	0.36	0.01	0.13	47.45
	Bedrock GWA-36RA to GWC-17R	653.68	650.64	3.04	1215	0.003	0.36	0.01	0.09	32.85
	Bedrock GWC-25R to GWC-21R	653.31	652.21	1.10	1325	0.001	0.36	0.01	0.03	10.95
	Overburden GWA-41 to GWC-44	666.32	664.55	1.77	975	0.002	0.072	0.01	0.01	3.65
	Overburden GWC-49Z to GWC-48	655.86	652.98	2.88	270	0.011	0.072	0.01	0.08	29.20
Cells 9 & 10	Overburden GWC-45 to GWC-47	662.53	652.23	10.30	525	0.020	0.072	0.01	0.14	51.10
Cells 9 & 10	Bedrock GWA-41R to GWC-45R	666.34	652.19	14.15	1350	0.010	0.36	0.01	0.38	138.70
	Bedrock GWC-49R to GWC-47R	656.15	652.46	3.69	550	0.007	0.36	0.01	0.24	87.60
	Bedrock GWA-41R to GWC-43R	666.34	660.82	5.52	600	0.009	0.36	0.01	0.33	120.45

Notes:

The average hydraulic conductivity values, measured in centimeters/second (cm/sec) used in the soil aquifer calculations (2.54 x 10-5 cm/sec = 0.072 ft/day) and the

bedrock aquifer calculations (1.26 x 10-4 cm/sec = 0.36 ft/day) are presented in the 2002 *Plant Bowen Proposed Coal Combustion By-Product Storage Facility Site Acceptability Report.* An estimated effective porosity of 0.01 (based on default soil type value for silty clays to clays in USEPA 530/SW-89-031) of the screened horizon.

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost aquifer beneath the Site. Locations are selected based on disposal cell layouts and site geologic and hydrogeologic considerations. Georgia Power Company (GPC) follows the recommendation as stated in Chapter 2 of the Manual for Groundwater Monitoring (1991) to determine well spacing based on site-specific conditions. Locations are chosen to serve as upgradient (GWA), or downgradient (GWC) based on groundwater flow direction determined by potentiometric evaluation. The well naming nomenclature is based on Georgia EPD's Industrial Waste Disposal Site Design and Operations Plan – Supplemental Data for Solid Waste Handling Permit (May 2014). Monitoring wells have been identified for six constructed Landfill units (Cells 1 & 2, 3 & 4, and 9 & 10) and four unconstructed Landfill units (Cells 5 & 6 and 7 & 8). The wells associated with Cells 5 & 6 and 7 & 8 have not been installed. Following installation of these monitoring wells, a well installation report documenting the actual well locations with the construction details and well logs will be submitted to Georgia EPD in a future well installation report. Well installation will be conducted under the direction of a qualified groundwater scientist.

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

A map depicting monitoring well locations is included in **Appendix A**. A tabulated list of individual monitoring wells used for groundwater sampling and water levels including well construction details such as location coordinates, top-of-casing elevation, well depths and screened intervals are also included in **Appendix A**. There are four wells (GWA-4R, GWC-13R, GWC-14, and GWC-15) not included in the groundwater monitoring network because these wells were replaced by new monitoring wells at the same locations that are included in the current monitoring network.

Any change to the groundwater monitoring or surface water monitoring network must be made by a minor modification to the permit pursuant to 391-3-4-.02(3)(b)6.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The existing monitoring well network for the CCR Landfill is in place. Existing monitoring wells were installed following Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells as a general guide for best practices. Monitoring well logs, for the existing monitoring well network, are included in **Appendix A** (**Attachment A1: Well Construction and Boring Logs**). The following sections describe the methods used for well drilling, construction, abandonment, and reporting for modification to the well network at the CCR Landfill.

4.1 Drilling

A variety of well drilling methods are available for the purpose of installing groundwater wells. Drilling methodology may include, but not be limited to: hollow stem augers, direct push, air rotary, mud rotary, or rotosonic techniques. The drilling method shall minimize the disturbance of subsurface materials and shall not cause impact to the groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in site-specific geology. Monitoring wells will be installed using the most current version of the Region 4 U.S. Environmental Protection Agency (USEPA) Science and Ecosystem Support Division (SESD) Operating Procedure SESDGUID-101-R2 and updates as a general guide for best practices. Drilling equipment shall be decontaminated before use and between borehole locations using the procedures described in the current version of the USEPA procedure LSASDPROC-205-R4 for Field Equipment Cleaning and Decontamination as a general guide.

Sampling and/or coring may be used to help determine the stratigraphy and geology. Samples will be logged under the oversight of a qualified groundwater scientist. Screen depths will be chosen based on the depth of the uppermost aquifer.

All drilling for any subsurface hydrologic investigation, installation, or abandonment of groundwater wells at a landfill in Georgia must be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. Proof of bonding for wells installed at the Landfill, installed from 2007 to the present, is included as **Attachment A2: Well Drilling Contractor Proof of Bonding** in **Appendix A**. For future installations, proof of bonding will be included in the well installation reports. Drilling and well installation activities will be directed by a qualified groundwater scientist registered in Georgia.

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

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

Well Intake Design

The design and construction of the intake of the groundwater wells shall: (1) allow sufficient groundwater flow to the well for sampling; (2) minimize the passage of formation materials (turbidity) into the well; and (3) ensure sufficient structural integrity to prevent the collapse of the intake structure.

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

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

Filter Pack and Annular Seal

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

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

The annulus above the bentonite seal will be grouted with a cement and bentonite mixture (approximately 94 pounds cement / 3 to 5 pounds bentonite / 6.5 gallons of potable water) placed via tremie pipe from the top of the bentonite seal. During grouting, care will be taken to assure that the bentonite seal is not disturbed by locating the base of the tremie pipe approximately 2 feet above the bentonite seal and injecting grout at low pressure/velocity.

Protective Casing and Well Completion

After allowing the grout to settle, the well will be finished by installing a flush-mount or aboveground 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, four inches thick, and sloped to drain water away from the well.

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

Protective bollards may 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 Details**, illustrates the general design and construction details for a monitoring well.

Well Development

No sooner than 24 hours 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 measured turbidity less than 10 NTUs is achieved. Additionally, the stabilization criteria contained in **Appendix C: Groundwater Sampling Procedures** should be met after well development and during low-flow sampling. A variety of techniques may be used to develop site groundwater monitoring wells and should be in accordance with USEPA SESDGUID-101-R2. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. All development equipment will be decontaminated prior to first use and between wells.

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

Many geologic formations contain clay and silt particles that are small enough to work their way through the wells' filter packs over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, the monitoring wells may have to be redeveloped periodically to remove the silt and clay that has worked its way into the filter pack of the monitoring wells. Each monitoring well should be redeveloped when sample turbidity values have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above. Well development data will be included in future well installation reports.

Surveying

The monitoring wells and piezometers were surveyed by Donaldson & Garrett Associates Inc, with a horizontal accuracy of 0.5 feet referenced to Georgia State Plane Coordinate System (Georgia State Plane, West Zone, NAD83) and a vertical accuracy of 0.01 feet referenced to North American Vertical Datum 1988 (NAVD88). The certified surveyor's report is included in **Attachment A3 of Appendix A: Surveyor's Certification.**

4.3 Well Abandonment

Per Georgia EPD Rule 391-3-4-.10(6)(g): Monitoring wells require replacement after two consecutive dry sampling events unless an alternate schedule has been approved by the Georgia EPD. A minor modification will be submitted in accordance with 391-3-4-.02(3)(b)6 prior to the installation or decommissioning of monitoring wells. Well replacement and abandonment will be directed by a qualified groundwater scientist, registered to practice in the State of Georgia.

Monitoring wells will be abandoned using industry-accepted practices and using the Manual for Groundwater Monitoring (1991) and Georgia Water Well Standards Act (1985) as guides. 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 future landfill expansion will be over-drilled prior to abandonment. Well abandonment reports will be submitted to Georgia EPD within 60 days of completion of well abandonment by a qualified groundwater scientist or engineer and will follow the applicable documentation requirements for well abandonment described in Section 4.4.

4.4 Documentation

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

- Well Identification
- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Advisory Council
- Dates of drilling and initial well emplacement
- Drilling technique used and drilling fluid if used
- Borehole diameter and well casing diameter
- Well depth (±0.1 ft.)
- Lithologic logs
- Well casing materials
- Casing and screen joint type
- Screen materials and design
- Screen length

- Screened interval in feet below ground surface and elevation (in feet NAVD88)
- Screened interval lithology
- Screen slot size
- Details of filter pack construction including material/size and volume, and placement depths
- Filter pack emplacement method (narrative)
- Sealant emplacement method and including material/size and volume, and placement depths
- Type of protective well cap and sump dimension for each well
- Surface seal construction including materials, volumes/mix of annular seal material
- Documentation stating that a Georgia-registered professional surveyor shall certify that the horizontal accuracy for the installed monitoring wells is 0.5 feet, and vertical accuracy for elevations to 0.01 feet using a known datum.
- Schematic of the well with dimensions
- Well development dates
- Well turbidity following development
- Narrative of well development method(s)-specific well development procedures

In accordance with the Georgia Water Well Standards Act (O.C.G.A. § 12-5-134(5)(d)(vii)), at least once every five years, the owner of the property on which a monitoring well is constructed shall have the monitoring well(s) inspected by a professional engineer or professional geologist, who shall direct appropriate remedial corrective work to be performed if the well does not conform to standards. Well inspection records and records of remedial corrective work are subject to review by EPD. Additionally, as part of the post closure care plan, the cost estimate based upon current year cost for the well inspections will be provided for as part of the cost calculations for the groundwater monitoring period.

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 2: Groundwater Monitoring Parameters & Frequency, presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from each groundwater well will be collected and analyzed for EPD-approved modified Appendix I and Appendix II test parameters (a subset of the full list contained in 40 CFR 258), as well as 40 CFR 257, Subpart D, Appendix III and Appendix IV test parameters to establish a background statistical dataset. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for Appendix I and III will be at least semi-annual during the active life of the facility and the post-closure care period. If required, Georgia Power will conduct assessment monitoring in accordance with the Georgia Rules for Solid Waste Management Chapter 391-3-4-.10 to also include EPD-approved modified Appendix II and 40 CFR, Subpart D Appendix IV test parameters.

As shown on **Table 3: Analytical Methods**, the groundwater samples will be analyzed using methods specified in USEPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), USEPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), American Society for Testing and Materials (ASTM), or other suitable analytical methods approved by the Georgia EPD. The method used will be able to reach a suitable practical quantification limit to detect natural background conditions at the facility and be less than regulatory standards. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP) and will also have a Stipulation Letter from the Georgia EPD accepting the laboratory's NELAP certification. Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

TABLE 2 GROUNDWATER MONITORING PARAMETERS & FREQUENCY Plant Bowen Landfill Cells 1 & 2, 3 & 4, and 9 & 10 Bartow County, Georgia

Monitoring	Parameters	Groundwater Monitoring Frequency Semi-Annual Events
	Temperature	Х
	pН	Х
	Specific Conductance	Х
Field Parameters	Oxidation Reduction Potential (ORP)	Х
	Turbidity	Х
	Dissolved Oxygen (DO)	Х
	Antimony	Х
	Arsenic	Х
	Barium	Х
	Beryllium	Х
Appendix I and II	Cadmium	Х
(EPD-approved modified	Chromium	Х
Appendix I and II test	Cobalt	Х
258, Subpart E)	Copper	Х
	Lead	Х
	Mercury	Х
	Nickel	Х
	Selenium	Х
	Silver	Х
	Thallium	Х
	Vanadium	Х
	Zinc	Х
	Boron	Х
	Calcium	Х
Appendix III	Chloride	Х
(Detection test	Fluoride	Х
257 Subpart D)	pH (field)	X
	Sulfate	Х
	Total Dissolved Solids	Х

TABLE 2 - continuedGROUNDWATER MONITORING PARAMETERS & FREQUENCYPlant BowenLandfill Cells 1 & 2, 3 & 4, and 9 & 10Bartow County, Georgia

Monitoring	Groundwater Monitoring Frequency	
	1	Semi-Annual Events
	Antimony	
	Arsenic	
	Barium	
	Beryllium	
	Cadmium	Assessment sampling frequency and parameter list determined in
	Chromium	accordance with Georgia Chapter
Appendix IV	Cobalt	391-3-410(6).
parameters from 40	Fluoride	
CFR 257, Subpart D)	Lead	
	Lithium	
	Mercury	
	Molybdenum	
	Selenium	
	Thallium	
	Radium 226 & 228	

TABLE 3ANALYTICAL METHODSPlant BowenLandfill Cells 1 & 2, 3 & 4, and 9 & 10Bartow County, Georgia

Parameters	USEPA Method Number
Boron	EPA 6010D/6020B
Calcium	EPA 6010D/6020B/7140
Chloride	EPA 300.0/300.1/9250/9251/9253/9056A
Fluoride	EPA 300.0/300.1/9214/9056A
рН	EPA 150.1 field
Sulfate	EPA 300.0/300.1/9035/9036/9038/9056A
Total Dissolved Solids (TDS)	EPA 160.1/ Standard Method 2540C
Antimony	EPA 6010D/6020B/7040/7041
Arsenic	EPA 6010D/6020B/7060A/7061A
Barium	EPA 6010D/6020B/7080A/7081
Beryllium	EPA 6010D/6020B/7090/7091
Cadmium	EPA 6010D/6020B/7130/7131A
Chromium	EPA 6010D/6020B/7190/7191
Cobalt	EPA 6010D/6020B/7200/7201
Copper	EPA 6010D/6020B
Lead	EPA 6010D/6020B/7420/7421
Lithium	EPA 6010D/6020B/7430
Mercury	EPA 7470A
Molybdenum	EPA 6010D/6020B/7480/7481
Nickel	EPA 6010D/6020B
Selenium	EPA 6010D/6020B/7740/7741A
Silver	EPA 6010D/6020B
Thallium	EPA 6010D/6020B/7840/7841
Vanadium	EPA 6010D/6020B
Zinc	EPA 6010D/6020B
Radium 226 and 228 combined	EPA 9315/9320

6. SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in **Appendix C: Groundwater Sampling Procedures**. Sampling procedures were developed using standard industry practice and USEPA Region 4 Field Branches Quality System and Technical Procedures for the Science and Ecosystem Support Division as a guide. Low-flow sampling methodology will be utilized for sample collection. Alternative industry accepted sampling techniques may be used when appropriate with prior Georgia EPD approval.

For groundwater sampling, positive gas displacement Teflon or stainless-steel bladder pumps with PVC intake screens 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, unless an alternate schedule has been approved by Georgia EPD. A minor modification will be submitted in accordance with 391-3-4-.02(3)(b)6 prior to the installation or decommissioning of monitoring wells. Well replacement and abandonment will be directed by a qualified groundwater scientist, registered in Georgia.

During each sampling event, surface water samples will be collected and handled in accordance with the procedures specified in **Appendix D: Surface Water Sampling and Analysis Procedures.** These procedures were developed using field sampling guidelines described in the USEPA Region 4 Laboratory Services and Applied Science Division (LSASD) Operating Procedure for Surface Water Sampling (LSASDPROC-201-R5) and updates. For surface water sampling, dedicated, non-dedicated, or disposable sampling equipment may be used.

7. CHAIN-OF-CUSTODY

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

- Sample identification numbers
- Signature of collector
- Date and time of collection
- Sample type
- Sample point identification
- Number of sample containers
- Signature of person(s) involved in the chain of possession
- Dates and times of possession by each individual
- Notated dates(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 must relinquish possession and the samples must be received by the new owner. The transfer times and dates during transfer of samples between individuals will be documented and included in the laboratory reports.

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

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

8. FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL

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

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

Field Duplicates - Field duplicates are collected by filling additional containers at the same location, and the field duplicate is assigned a unique sample identification number. One blind field duplicate will be collected for every 20 samples.

Field Blanks - Field blanks 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. The calibration will be conducted each day prior to the initiation of sampling. Daily calibration will be documented on field forms and these field forms will be included in each groundwater monitoring report.

Instruments will be recalibrated as necessary (e.g., when calibration checks indicate significant variability), and all checks and recalibration steps will be documented on the field 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 if 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 Georgia EPD. Semi-annual groundwater monitoring reports will be submitted to the Georgia EPD within 90 days of receipt of the groundwater analytical data from the laboratory. At a minimum, semi-annual reports will include:

- 1. A narrative describing sampling activities and findings including a summary of the number of samples collected, the dates the samples were collected and whether the samples were required by the detection or assessment monitoring programs.
- 2. A brief overview of purging/sampling methodologies.
- 3. Discussion of results.
- 4. Recommendations for the future monitoring consistent with the Rules.
- 5. Potentiometric surface contour map for the aquifer(s) being monitored signed and sealed by a Georgia-registered P.G. or P.E.
- 6. Table of as-built information for groundwater monitoring wells including top of casing elevations, ground elevations, screened elevations, current groundwater elevations and depth to water measurements.
- 7. Groundwater flow rate and direction calculations.
- 8. Identification of any groundwater wells that were installed or decommissioned during the preceding year, along with a narrative description of why these actions were taken.
- 9. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
- 10. If applicable, semi-annual assessment monitoring results.
- 11. Any alternate source demonstration completed during the previous monitoring period, if applicable.
- 12. Laboratory reports.
- 13. COC documentation.
- 14. Field sampling logs including field instrument calibration indicator parameters and parameter stabilization data.
- 15. A record of field sampling conditions including, well signage, well access, sampling and purging equipment condition and site conditions that may affect sampling will be recorded on Well Inspection Forms. These forms will be included as an appendix to the semi-annual groundwater monitoring reports.
- 16. Documentation of non-functioning wells, dry surface water sampling locations.
- 17. Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL).
- 18. Plume delineation (if applicable based on exceedances of groundwater protection standards)

- 19. Potable water well survey (annually, if applicable based on exceedances of groundwater protection standards)
- 20. Statistical analyses.
- 21. Certification by a qualified groundwater scientist.
- 22. Tabulated water quality results for the samples of discharging surface water collected semi-annually from the designated surface water sampling locations. The table will present data for the current reporting period. Data from historical monitoring events associated with the surface water monitoring program will be provided in report appendices.

10. STATISTICAL ANALYSIS

Groundwater quality data from each sampling event will be statistically evaluated to determine if there has been a statistically significant change in groundwater chemistry. Historical background data will be used to determine statistical limits. Statistical analysis techniques will be consistent with the methodology presented in *Statistical Analysis of Groundwater Data at RCRA Facilities, Unified Guidance*, March 2009, EPA 530/R-09-007 (USEPA, 2009).

According to Georgia EPD rule 391-3-4-.10(6)(a), which incorporates the statistical analysis requirements of 40 CFR 257.93 by reference, the Site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each constituent. The statistical test chosen shall be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that will be used include:

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

Based on site-specific conditions, statistical methods may be intrawell, interwell, or combination of both. Intrawell methods use background data for individual wells and may be overly sensitive to natural variation; therefore, statistically significant increases (SSIs) may occur as a result of natural variation rather than facility impacts. A second step can be used to further evaluate the results and mitigate SSIs that result from natural variation. In instances where intrawell statistical methods identify an apparent SSI, a second step of interwell statistical evaluation may be used to determine whether the measurement exceeds the sitewide background limit. This is similar in concept to the procedure used in compliance monitoring programs where an interwell statistical limit is used to determine background per USEPA Unified Guidance (2009). Both interwell and intrawell methods may use a 1-of-2 resample plan, allowing for a collection of an independent resample to confirm or disconfirm the initial finding. If the result does not exceed sitewide (interwell) background, an SSI is not declared, and no further action is needed to stay in detection monitoring. Trend tests will continue to be included in Semi-Annual and Annual Groundwater Monitoring and Corrective Action Reports for constituents exhibiting an SSI using an intrawell statistical method that does not exceed sitewide (interwell) background.

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) and §257.93. Figure 1: Statistical Analysis Plan Overview, includes a flowchart that depicts the process that will be followed to develop the site-specific plan. Figure 2: Decision Logic for Determining Appropriate Statistical Method, depicts the decision logic that will be used to determine the

appropriate method as required by 391-3-4-.10(6) or §257.93. Figure 3: Decision Logic for Computing Intrawell Prediction Limits, presents the logic that will be used to calculate site-specific intrawell statistical limits and test compliance results against those limits. Figure 4: Decision Logic for Computing Interwell Prediction Limits, presents the logic that will be used to calculate site-specific interwell statistical limits and test compliance results against those limits.

11. REFERENCES

Croft, M.G., 1963. Geology and Ground-Water Resources of Bartow County, Georgia. U.S. Geological Survey Water-Supply Paper 1619-FF, 37 p.

Georgia Environmental Protection Division, 1991. Manual for Groundwater Monitoring. (Pp 38).

- Southern Company Services, Inc. (SCS) 2002. Plant Bowen Coal Combustion By-Products Storage Facility Site Acceptability Report.
- Southern Company Services, Inc. (SCS) 2004. Plant Bowen Proposed Coal Combustion By-Product Monofill Addendum I Site Acceptability Report – Hydrogeological Assessment and Demonstration of Engineering Measures.
- United States Environmental Protection Agency, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery – Program Implementation and Information Division. USEPA 530/R-09-007.
- United States Environmental Protection Agency, Region 4 Laboratory Services and Applied Science Division, 2021. Operating Procedure for Surface Water Sampling. LSASDPROC-201-R5 (effective December 23, 2021).
- United States Environmental Protection Agency, Region 4 Science and Ecosystem Support Division, 2017. Operating Procedure for Groundwater Sampling. SESDPROC-301-R4 (effective April 26, 2017).
- 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 (effective January 16, 2018).
- United States Environmental Protection Agency, Region 4 Laboratory Services and Applied Science Division, 2020. Operating Procedure for Field Equipment Cleaning and Decontamination. LSASDPROC-205-R4 (effective June 22, 2020).
- United States Environmental Protection Agency, 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule.
- United States Environmental Protection Agency, 1995. 40 CFR Part 258. Hazardous and Solid Waste Management System, Criteria for Municipal Solid Waste Landfills
- Wood Environment & Infrastructure Solutions, Inc., 2022. Plant Bowen Landfill Cells 1 & 2, 3 & 4, and 9 & 10 2021 Annual Groundwater Monitoring & Corrective Action Report, January 31, 2022.

FIGURE 1: STATISTICAL ANALYSIS PLAN OVERVIEW





FIGURE 2. DECISION LOGIC FOR DETERMINING APPROPRIATE



26

FIGURE 4. DECISION LOGIC FOR COMPUTING INTERWELL PREDICTION LIMITS



APPENDICES

- A. GROUNDWATER MONITORING NETWORK DOCUMENTATION
- B. GROUNDWATER MONITORING WELL DETAILS
- C. GROUNDWATER SAMPLING PROCEDURES
- D. SURFACE WATER SAMPLING AND ANALYSIS PROCEDURES

A. GROUNDWATER MONITORING NETWORK DOCUMENTATION

Table A1	Summary of Well Installation Dates, Coordinates, Elevation Screen Interval, and Purpose
Figure A1	Monitoring Well Network
Figure A2	Potentiometric Surface - Overburden Wells July 2021
Figure A3	Potentiometric Surface - Bedrock Wells July 2021
Attachment A1	Well Construction and Boring Logs
Attachment A2	Well Drilling Contractor Proof of Bonding
Attachment A3	Surveyor's Certification

TABLE A1

SUMMARY OF WELL INSTALLATION DATES, COORDINATES, ELEVATION SCREEN INTERVAL AND PURPOSE

Plant Bowen

Landfill Cells 1 & 2, 3 & 4, and 9 & 10

Bartow County, Georgia

Well Name	Installation Date	Northing (feet, NAD83) ⁽¹⁾	Easting (feet, NAD83) ⁽¹⁾	Ground Surface Elevation (feet, NAVD88) ⁽²⁾	Top of Casing Elevation (feet, NAVD88) ⁽²⁾	Top of Screen Elevation (feet, NAVD88) ⁽³⁾	Bottom of Screen Elevation (feet, NAVD88) ⁽³⁾	Screen Length (feet)	Total Well Depth on Construction Log (feet below land surface)	Lithology Screened	Hydraulic Location and Purpose	Horizontal Hydraulic Conductivity (feet per day) ⁽¹⁰⁾
GWA-1	4/12/2007	1502842.29	2071724.15	738.86	741.76	601.13	591.13	10.0	147.90	Overburden/Bedrock	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-2	4/4/2007	1502640.55	2071935.13	731.48	733.89	590.00	580.00	10.0	151.92	Overburden/Bedrock	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-2R	8/3/2007	1502615.38	2071965.52	732.66	734.83	637.53	627.53	10.0	106.03	Bedrock	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-3	4/11/2007	1502386.74	2072067.26	729.90	732.47	644.90	634.90	10.0	95.40	Overburden	Cells 1 & 2 - Upgradient ⁽⁴⁾⁽⁶⁾	NA
GWA-3A	3/16/2021	1502374.48	2072061.21	728.68	731.68	601.88	591.88	10.0	137.27	Overburden	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-4	3/14/2007	1502241.02	2072318.24	740.40	743.06	680.91	670.91	10.0	69.64	Overburden	Cells 1 & 2 - Upgradient ⁽⁵⁾⁽⁸⁾	NA
GWA-4R	3/13/2007	1502246.31	2072317.15	740.65	743.23	657.60	647.60	10.0	93.17	Bedrock	Cells 1 & 2 - Upgradient ⁽⁵⁾	NA
GWA-4RZ	10/28/2016	1502238.85	2072329.55	740.04	742.84	633.04	623.04	10.0	117.00	Bedrock	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-50	6/4/2008	1502154.80	2072442.13	728.74	731.21	644.71	634.71	10.0	94.33	Overburden	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWA-50R	6/10/2008	1502150.85	2072448.35	727.87	730.37	599.69	589.69	10.0	138.48	Bedrock	Cells 1 & 2 - Upgradient ⁽⁴⁾	NA
GWC-5	4/18/2006	1502341.56	2072677.44	735.11	737.56	634.00	624.00	10.0	111.29	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-6	5/1/2007	1502520.08	2072962.89	725.97	728.64	628.35	618.35	10.3	107.53	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-6RZ	4/28/2015	1502502.00	2072900.50	728.66	731.91	633.66	623.66	10.0	105.30	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-7Z	5/19/2016	1502640.13	2073193.22	709.70	713.04	606.00	596.00	10.0	114.00	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-8Z	4/28/2015	1502827.67	2073526.15	698.68	702.09	635.68	625.68	10.0	73.30	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-8RR	6/27/2011	1502857.71	2073501.74	698.96	701.92	601.96	591.96	10.0	107.30	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-9	8/16/2006	1503018.96	2073781.05	691.99	694.67	631.81	621.81	10.0	70.47	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-10	9/6/2006	1503162.70	2074019.96	684.89	687.87	626.70	616.70	10.0	68.33	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-10R	5/15/2007	1503154.01	2074020.44	685.33	687.95	599.83	589.83	10.0	95.18	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-11	6/1/2007	1503390.40	2073829.95	675.04	677.83	643.28	633.28	10.0	41.71	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-11R	5/31/2007	1503395.25	2073828.03	675.98	677.73	608.08	598.08	10.0	78.85	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-12	6/4/2007	1503662.54	2073693.63	674.66	677.25	636.56	626.56	10.0	48.41	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-13	5/31/2007	1503898.17	2073495.16	684.19	686.76	613.75	603.75	10.0	80.43	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA
GWC-13R	6/5/2007	1503908.53	2073501.95	683.17	685.97	594.17	584.17	10.0	99.10	Bedrock	Cells 1 & 2 - Downgradient ⁽⁵⁾	NA
GWC-13RZ	11/2/2016	1503926.70	2073517.44	681.71	684.60	589.71	579.71	10.0	102.00	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	0.028
GWC-14	8/22/2007	1504059.92	2073205.96	684.04	686.81	616.30	606.30	10.0	78.01	Overburden	Cells 1 & 2 - Downgradient ⁽⁵⁾	NA
GWC-14Z	11/3/2016	1504060.77	2073193.66	684.34	687.28	621.34	611.34	10.0	73.00	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	0.088
GWC-15	6/1/2007	1503943.59	2072927.52	692.75	695.19	635.74	625.74	10.0	67.11	Overburden	Cells 1 & 2 - Downgradient ⁽⁵⁾	NA
GWC-15Z	10/31/2016	1503952.26	2072918.71	693.28	695.92	631.30	621.30	10.0	72.00	Overburden	Cells 1 & 2 - Downgradient ⁽⁴⁾	0.368
GWC-15R	5/24/2007	1503936.17	2072919.39	693.39	696.13	611.25	601.25	10.0	92.36	Bedrock	Cells 1 & 2 - Downgradient ⁽⁴⁾	NA

TABLE A1

SUMMARY OF WELL INSTALLATION DATES, COORDINATES, ELEVATION SCREEN INTERVAL AND PURPOSE

Plant Bowen

Landfill Cells 1 & 2, 3 & 4, and 9 & 10

Bartow County, Georgia

Well Name	Installation Date	Northing (feet, NAD83) ⁽¹⁾	Easting (feet, NAD83) ⁽¹⁾	Ground Surface Elevation (feet, NAVD88) ⁽²⁾	Top of Casing Elevation (feet, NAVD88) ⁽²⁾	Top of Screen Elevation (feet, NAVD88) ⁽³⁾	Bottom of Screen Elevation (feet, NAVD88) ⁽³⁾	Screen Length (feet)	Total Well Depth on Construction Log (feet below land surface)	Lithology Screened	Hydraulic Location and Purpose	Horizontal Hydraulic Conductivity (feet per day) ⁽¹⁰⁾
GWA-36	6/16/2011	1505057.77	2073384.03	681.89	684.50	616.19	606.19	10.0	76.00	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾⁽⁹⁾	NA
GWA-36A	3/18/2022	1505026.95	2073357.46	680.63	683.75	588.80	578.80	10.0	102.16	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-36R	6/15/2011	1505051.72	2073384.47	681.41	684.16	605.71	595.71	10.0	86.00	Bedrock	Cells 3 & 4 - Upgradient ⁽⁴⁾⁽⁷⁾	NA
GWA-36RA	7/2/2021	1505060.13	2073365.45	682.26	685.20	583.26	573.26	10.0	109.40	Bedrock	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-37	9/11/2013	1505345.45	2073069.32	700.44	703.72	606.24	596.24	10.0	104.50	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-38	6/13/2011	1505501.33	2072831.77	713.32	716.24	658.62	648.62	10.0	65.00	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-51RZ	3/1/2016	1505310.36	2073781.34	705.81	708.58	625.11	615.11	10.0	91.00	Bedrock	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-52	4/21/2015	1505459.85	2073876.00	706.56	709.77	636.06	625.90	10.0	80.96	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-53	4/10/2015	1505695.52	2074038.90	707.61	710.99	600.11	590.06	10.0	117.85	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-53R	4/10/2015	1505689.06	2074032.00	708.38	711.58	554.38	543.24	11.0	165.44	Bedrock	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-54	4/14/2015	1505853.39	2074286.28	701.23	704.23	638.23	628.36	10.0	73.17	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-55	4/15/2015	1506034.69	2074507.04	693.43	696.72	641.43	632.31	10.0	62.42	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-55R	4/15/2015	1506041.22	2074517.62	693.28	696.53	600.78	590.85	10.0	102.83	Bedrock	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWA-56	4/16/2015	1506128.38	2074633.08	689.14	692.17	616.14	606.48	10.0	82.96	Overburden	Cells 3 & 4 - Upgradient ⁽⁴⁾	NA
GWC-16R	12/13/2011	1505877.86	2072607.38	727.77	730.59	643.07	633.07	10.0	95.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-17R	12/8/2011	1506069.29	2072829.29	730.02	733.37	650.82	640.82	10.0	89.50	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-18	6/6/2011	1506306.70	2072929.28	718.92	721.88	651.22	642.22	9.0	77.00	Overburden	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-18R	6/2/2011	1506301.39	2072929.47	718.97	721.76	591.77	581.77	10.0	137.50	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-19R	6/7/2011	1506395.96	2073158.36	723.13	726.31	589.43	579.43	10.0	144.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-20R	6/9/2011	1506602.14	2073486.53	717.63	720.59	643.63	633.63	10.0	84.30	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-21R	12/16/2011	1506695.89	2073784.42	720.45	723.07	641.25	631.25	10.0	89.50	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-22R	6/14/2011	1506717.93	2074105.65	712.54	715.41	605.84	595.84	10.0	117.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-23R	6/28/2011	1506701.61	2074446.53	688.02	690.94	651.32	641.32	10.0	47.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-24R	6/21/2011	1506694.13	2074806.11	673.76	676.57	647.06	637.06	10.0	37.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA
GWC-25R	6/21/2011	1506494.89	2075088.90	673.59	676.42	586.89	576.89	10.0	97.00	Bedrock	Cells 3 & 4 - Downgradient ⁽⁴⁾	NA

TABLE A1

SUMMARY OF WELL INSTALLATION DATES, COORDINATES, ELEVATION SCREEN INTERVAL AND PURPOSE

Plant Bowen

Landfill Cells 1 & 2, 3 & 4, and 9 & 10

Bartow County, Georgia

Well Name	Installation Date	Northing (feet, NAD83) ⁽¹⁾	Easting (feet, NAD83) ⁽¹⁾	Ground Surface Elevation (feet, NAVD88) ⁽²⁾	Top of Casing Elevation (feet, NAVD88) ⁽²⁾	Top of Screen Elevation (feet, NAVD88) ⁽³⁾	Bottom of Screen Elevation (feet, NAVD88) ⁽³⁾	Screen Length (feet)	Total Well Depth on Construction Log (feet below land surface)	Lithology Screened	Hydraulic Location and Purpose	Horizontal Hydraulic Conductivity (feet per day) ⁽¹⁰⁾
GWA-39Z	3/1/2016	1502655.66	2071120.65	731.80	735.15	628.30	618.30	10.0	113.80	Overburden	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-39RZ	11/4/2016	1502618.73	2071164.20	729.57	732.62	602.57	592.57	10.0	137.00	Bedrock	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-40	6/7/2011	1503195.09	2071299.94	728.93	731.77	589.03	579.03	10.0	150.20	Overburden	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-41	6/6/2011	1503519.02	2071046.18	738.91	742.35	646.41	636.41	10.0	102.54	Overburden	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-41R	6/1/2011	1503527.39	2071050.84	737.95	743.08	635.19	625.19	10.0	113.06	Bedrock	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-42	6/1/2011	1503823.34	2071049.95	734.45	738.05	662.69	652.69	10.0	82.06	Overburden	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-43	5/25/2011	1504129.20	2070982.44	707.61	710.94	627.71	617.71	10.0	90.20	Overburden	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWA-43R	5/25/2011	1504117.39	2070973.14	707.80	711.19	594.10	584.10	10.0	124.20	Bedrock	Cells 9 & 10 - Upgradient ⁽⁴⁾	NA
GWC-44	6/9/2011	1504436.66	2071414.30	710.15	712.89	637.22	627.22	10.0	83.23	Overburden	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-45	5/17/2007	1504539.38	2071956.71	698.41	701.53	643.98	633.98	10.0	64.73	Overburden	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-45R	5/22/2007	1504538.68	2071945.39	699.00	702.02	583.56	573.56	10.0	125.74	Bedrock	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-46R	8/15/2014	1504522.23	2072184.47	687.94	690.49	641.84	631.84	10.0	56.50	Bedrock	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-47	4/24/2014	1504543.69	2072481.34	687.44	690.86	630.44	620.44	10.0	67.33	Overburden	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-47R	4/24/2014	1504539.25	2072467.10	687.71	691.13	616.91	606.91	10.0	81.20	Bedrock	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-48	6/8/2011	1504490.63	2072851.71	686.20	688.33	642.70	632.70	10.0	54.00	Overburden	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-49Z	3/1/2016	1504238.30	2072896.49	706.12	709.11	626.92	616.92	10.0	89.50	Overburden	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA
GWC-49R	4/17/2014	1504246.02	2072918.76	706.24	709.56	585.54	575.54	10.0	131.10	Bedrock	Cells 9 & 10 - Downgradient ⁽⁴⁾	NA

Notes:

(1) NAD83 indicates feet (ft) referenced to the North American Datum of 1983. Coordinates are from March 2021 re-survey of the Landfill wells by Donaldson & Garret Associates, Inc.

(2) NAVD88 indicates feet (ft) in elevation referenced to the North American Vertical Datum 1988. Elevations are from March 2021 re-survey of the Landfill wells by Donaldson & Garret Associates, Inc.

(3) Screen elevations calculated using depth below land surface and ground surface elevations from the March 2021 re-survey.

(4) Monitoring wells are measured for water levels and sampled for groundwater quality.

(5) Water Level Piezometers measured for water level only.

(6) GWA-3 was abandoned on 2/19/2021 and was replaced with new well GWA-3A, completed on 3/16/2021 with installation of protective cover and pad.

(7) GWA-36R was abandoned on 7/1/2021 and was replaced with new well GWA-36RA, completed on 7/2/2021 with installation of protective cover and pad.

(8) GWA-4 was abandoned on 3/15/2022.

(9) GWA-36 was abandoned on 3/16/2022 and was replaced with new well GWA-36A, completed on 3/18/2022 with installation of protective cover and pad.

(10) Horizontal Hydraulic Conductivity evaluated using slug test methodology.

The average hydraulic conductivity values used in the soil aquifer calculations (2.54 x 10-5 cm/sec = 0.072 ft/day) and the bedrock aquifer calculations (1.26 x 10-4 cm/sec = 0.36 ft/day) were presented in the

Plant Bowen Proposed Coal Combustion By-Product Storage Facility Site Acceptability Report (SCS, 2002) and were computed from the slug test data collected as part of that investigation.

NA indicates data not available

Legend

250

500

Spring Water Sampling Location \bigcirc **Compliance Monitoring Well Location** \oplus Cells 1&2 Cells 3&4 Cells 9&10 \oplus Cells 1&2 Water Level Piezometer Proposed Monitoring Well \oplus Abandoned Well Monitoring Wells to be Abandoned During the Construction of Cells 5 & 6 * Landfill Permit Boundary Surface Water Body Expression



SPRING WATER SAMPLE LOC.

GWC-25R

GWC-26

GWC-27 GWC-27R

GWC-28

Proposed Cell 7 GWC-29 GWC-29R

GWC-30

GWC-31

GWC-32

GWC-31R

Proposed Cell 8

> GWA-33 GWA-33R

> > Georgia Power - Plant Bowen Cells 1&2, 3&4, and 9&10

Groundwater Monitoring Plan

Monitoring Well Network

Prepared by/Date: THP 9/27/2022 Checked by/Date:: RRQ 9/27/2022 Project Number: 6122160287

wsp

Figure Number: A1
Legend

- Well Location Cells 1 & 2
- Well Location Cells 3 & 4
- Well Location Cells 9 & 10
- Interpreted Groundwater Flow Direction
- Potentiometric Surface Contour in Feet
- 654.01 Groundwater Elevation in Feet



GWA-3A 655.47*
GWA-4 677
DRY 672
G72

GWA-50 672.08

660.91

600 1,200

300

n





Groundwater Monitoring Plan

Potentiometric Surface – Overburden Wells July 2021

Prepared by/Date: JCD 9/27/2022 Checked by/Date:: RRQ 9/27/2022 Project Number: 6122160287

NSD



ject Numbe

Groundwater Monitoring Plan Georgia Power Company ■ Plant Bowen CCR Landfill September 2022 ■ WSP USA Project No. 6122160287

ATTACHMENT A1

WELL CONSTRUCTION AND BORING LOGS

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou		DRIL	LING L	.OG			Hole No.	GWA-1	
Energy	o Serve Yor	ar World GEOLOG	ICAL SE	RVICES			Sheet	1 of 5	
SITE _		Plant Bowen Dry Gypsum Storage Fa	acility		HOLE DEPTH	149'	SURF	.ELEV. 738	8.86
LOCAT		Cells 1 & 2	COOR	DINATES N	150284	2.29	E	2071724.15	
ANGLE		0 BEARING 0	CONT	RACTOR	SCS	C	DRILL NO.		
DRILLI	NG METHO	D HSA NO. SAMP	PLES	30	NO. U	.D. SAMPL	_ES	0	
CASING	G SIZE	LENGTH	co			TOTAL	% REC.		
WATEF	R TABLE DE	PTH105.5ELEV633.36	TIME AFTE	R COMP.		DAT		4/11/2007	
TYPE G	ROUT	QUANTITY	1	/IX	DRII	LING STA		4/4/2007	
DRILLE	R	B. Filipovich RECORDER J. Lippert APP	PROVED		DRII	LING COM	MP. DATE	4/11/2007	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	idard Penetration Test Blows	N	Comments	% Rec	RQD
0	720.06								
0	130.00								
1									
2									
3									
4		Stiff, light brown, silty CLAY with trace organics and limestone pebbles, dry	S-1	3.5-5	4-5-6	11		90	
5	733.86								
6									
7									
8									
9		Very stiff, reddish brown and gray mottled CLAY, low	S-2	8.5-10	6-8-11	19		100	
10	728 86	plasticity, with limestone pebbles and chert fragments,							
10	0.00	Signly most							
11									
12									
13									
14		Von stiff raddich brown candy SII T with chart	6.2	12 5 15	7 10 13	22		100	
14		fragments, slightly moist	0-0	10.0-10	7-10-13	25		100	
15	723.86								
16									
17									
18									
19		Same as above	S-4	18.5-20	9-11-16	27		90	
20	718.86								
04									
21									
22									
23									
24									

sou	THERN	DRILLI	NG L	.OG			Hole No.	GWA-1	
Energy	to Serve You	ir World GEOLOGICA	AL SE	RVICES		4.40	Sheet 2 of	5	
SITE -	Ū.	Plant Bowen Dry Gypsum Storage Facility		01	TOTAL DEPTH	149	SURF.ELEV.	738	.86
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	713.86	Very stiff, red with light brown and gray CLAY, high	S-5	23.5-25	8-10-14	24		100	
26									
27									
28									
29									
30	708.86	Same as above	S-6	28.5-30	6-8-10	18		100	
31									
32									
33									
34									
35	703.86	Same as above, stiff with chert pebbles	S-7	33.5-35	4-6-8	14		100	
36									
37									
38									
39									
40	698.86	Same as above, very moist, blocky structure	S-8	38.5-40	3-4-5	9		100	
41									
42									
43									
44									
45	693.86	Stiff, yellowish brown silty CLAY with chert,	S-9	43.5-45	3-4-5	9		100	
46		sand, and small pebbles, moist							
47									
48									
49									
50	688.86	Same as above, very stiff with large limestone	S-10	48.5-50	6-8-9	17		100	
51		gravel, some manganese oxide nodules							
52									
53									
54									
55	683.86	Same as above with mottled gray	S-11	53.5-55	11-13-11	24		90	
56									

sou	THERN	DR	ILLING L	OG			Hole No.	GWA-1	
Energy	to Serve You	GEOLC	OGICAL SE	RVICES			Sheet 3 of	5	
SITE -		Plant Bowen Dry Gypsum Storage Fac	ility		TOTAL DEPTH	149	SURF.ELEV.	738	.86
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	678.86	Stiff, light brown and reddish brown CLAY, high	S-12	58.5-60	4-5-7	12		90	
61		plasticity with quartz peoples, moist							
62									
63									
64									
65	673.86	Same as above, very moist	S-13	63.5-65	4-5-7	12		100	
66									
67									
68									
69									
70	668.86	Same as above	S-14	68.5-70	4-6-8	14		100	
71									
72									
73									
74									
75	663.86	Very stiff, light brown, sandy CLAY with chert fragments, moist	S-15	73.5-75	4-7-10	17		100	
76		-							
77									
78									
79									
80	658.86	Same as above, stiff	S-16	78.5-80	5-6-8	14		100	
81									
83									
84									
85	653.86	Chert seam from approximately 84.5-85.5	S-17	83.5-85	5-27-47	74		100	
86									
87									
88									

sou	THERN	DRIL	LING L	.OG			Hole No.	GWA-1	
Energy	to Serve You	r World GEOLOG	ICAL SE	RVICES			Sheet 4 of	5	
SITE -		Plant Bowen Dry Gypsum Storage Facili	ty		TOTAL DEPTH	149	SURF.ELEV.	738	8.86
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
89									
90	648.86	Same as above, very stiff	S-18	88.5-90	6-8-10	18		100	
91									
92									
93									
94									
95	643.86	Same as above, stiff with highly weathered quartz	S-19	93.5-95	4-5-7	12		100	
96		peobles, very moist							
97									
98									
99									
100	638.86	Same as above	S-20	98.5-100	4-4-6	10		100	
101									
102									
103									
104									
105	633.86	Same as above, with very highly weathered	S-21	103.5-105	4-5-7	12		100	
106									
107									
108	ļ								
109									
110	628.86	Same as above	S-22	108.5-110	6-4-6	10		100	
111									
112									
113									
114			C 00	440 5 445	0.4.5				
115	023.80	Same as above	5-23	113.5-115	2-4-5	9		100	
110									
118	1								
119									
120	<u>618.8</u> 6	Same as above, firm	S-24	118.5-120	2-2-4	6		90	

DRILLING LOG								Hole No. GWA-1		
Energy	to Serve You	ar World GEOLOGIC	AL SE	RVICES			Sheet 5 of	5		
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	149	SURF.ELEV.	738	8.86	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD	
121										
122										
123										
124										
125	613.86	Firm, light brown, sandy CLAY with vellowish	S-25	123.5-125	2-3-5	8		100		
126		brown SILT and chert gravel, wet								
127										
128										
129										
130	608.86	Hard, light brown sandy CLAY and abundant	S-26	128.5-130	8-27-4	31		90		
131		highly weathered dolomite, wet, parent rock structure visible in soil								
132										
133										
134										
135	603.86	Same as above, very soft, few chert fragments,	S-27	133.5-135	WOH	0		100		
136		less structured								
137										
138										
139										
140	598.86	Same as above, firm, some chert gravel	S-28	138.5-140	2-3-3	6		100		
141										
142										
143										
144										
145	593.86	Same as above, stiff	S-29	143.5-145	2-2-12	14		100		
146										
147										
148										
149	ļ	Very hard, weathered DOLOMITE, highly fractured	S-30	148.5-150	50/2-x-x	>50		90		
150	588.86									
151										
152	1		1							

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	SOUTHERN DF				OG			Hole No.	GWA-2	
Energy	COMP to Serve You	World"	GEOLOGICA	L SEF	RVICES			Sheet 1 of	5	
SITE _		Plant Bowen Dry Gyps	um Storage Facili	ty		HOLE DEPTH	151	SURF.ELE	v. <u>731</u>	.48
LOCAT		Cells 1 & 2		COORD	INATES N	1502640	0.55	E20	71935.13	
ANGLE		0 BEARING	0	CONTR	ACTOR	SCS	D	RILL NO.	CME-75	
DRILLI	NG METHO	D HSA	NO. SAMPLES		13	NO. U.	D. SAMPL	ES	0	
CASING	G SIZE	LENGTH		COI	RE SIZE			% REC.		
WATEF	R TABLE DE	ELEV.	TIM	E AFTER	R COMP.		DATE	E TAKEN		
TYPE 0	GROUT	QUANTI1	-Y	M	IX	DRIL	LING STAF	RT DATE 3	29/2007	
DRILLE	R	S. Denty RECORDER K.	Hobbs APPRON	/ED		DRIL	LING COM	IP. DATE	/3/2007	
Depth	Elev.	Material Description, Classification	and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	731.48									
1										
2										
2										
3		-								
4										
5	726.48	Stiff, dark brown/red SILT with some	sand, slightly moist	S-1	4.5-6	3-6-8	14		100	
6										
7										
8										
9										
10	721.48	Dark brown/red sandy SILT with peb	bles up to 4 cm, most	S-2	9.5-11	9-10-14	24		100	
11		pebbles 3-4 mm, areas of tan sand								
12										
13		•								
14										
14	716 49	Sama as shave		6.2	14 5 16	E 0 12	01		00	
10	710.40			3-3	14.5-10	5-0-15	21		90	
16										
1/										
18										
19										
20	711.48	Stiff, dark reddish brown sandy SILT grains up to 2 mm	with quartz sand	S-4	19.5-21	4-9-11	20		90	
21										
22										
23		1								
24										

sou	THERN	DRILLI	NG L	.OG			Hole No.	GWA-2	
Energy	to Serve You	ar World GEOLOGICA	AL SE	RVICES		4.5	Sheet 2 of	5	
SITE -	1	Plant Bowen Dry Gypsum Storage Facility		01	TOTAL DEPTH	15	SURF.ELEV.	731	.48
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	706.48	Stiff, dark reddish brown SILT with sand and pebbles up	S-5	24.5-25	3-5-8	13		100	
26									
27									
28									
29									
30	701.48	Same as above	S-6	29.5-31	5-7-11	18		100	
31									
32									
33									
34		-							
35	696.48	Dark reddish brown sandy pebbly SILT, approximately	S-7	34.5-36	5-10-15	25		60	
36		10% pebbles, slightly moist, but still crumbly							
37									
38									
39									
40	691.48	Dark reddish brown sandy SILT with pebbles up to 30	S-8	39.5-41	4-6-10	16		80	
41		mm in diameter, approximately 20% pebbles, slightly moist							
42									
43									
44									
45	686.48	Dark brown/red pebbly SILT, approximately 50% pebbles,	S-9	44.5-46	5-9-11	20		60	
46		areas of light brown silt, pebbles up to 20 mm in diameter							
47									
48									
49									
50	681.48	Mottled light brown, red/brown, and white silty CLAY	S-10	49.5-51	4-10-7	17		75	
51		sapronte, nigh plasticity, signity moist, no peoples							
52									
53	ļ								
54									
55	676.48	Highly weathered white, tan, and brown SAPROLITE,	S-11	54.5-56	9-11-37	48		50	
56		some bedding teatures still visible, uniform silt grain size. slightly moist							

sou	THERN	ANY	DRILLING	LOG			Hole No.	GWA-2	
Energy	to Serve You	ur World"	GEOLOGICAL SE	RVICES			Sheet 3 of	5	
SITE -		Plant Bowen Dry Gypsum Sto	orage Facility		TOTAL DEPTH	151	SURF.ELEV.	731	.48
Depth	Elev.	Material Description, Classification and Ren	narks No.	e Star From To	ndard Penetration Test Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	671.48	Firm, light brown, tan, and white silty SAP	ROLITE, S-12	59.5-61	6-7-9	16			
61		mottled, moist							
62									
63		•							
64									
04	666.49		S 11	64 5 66	567	12			
60	000.40	Same as above, wel	0-10	04.5-00	5-0-7	15			
66									
67									
68									
69									
70	661.48	Same as above	S-14	69.5-71	3-4-7	11			
71									
72									
73									
74									
75	656.48	Same as above	S-15	5 74.5-76	5-6-12	18			
76									
77									
78									
79									
80	651.48	White decomposed boulder	S-16	6 79.5-81	2-21-45	66			
81									
82									
83									
84									
85	646.48	Firm, Brown to white CLAY with silt	S-17	84.5-86	4-5-11	16			
86	<u> </u>								
87									
88									

sou	THERN	DRILL		Hole No. GWA-2						
Lucy	ta Serve Ya	e Warkt GEOLOGIC	AL SERVI	CES		151	151 IREFLEY 731.48			
SITE -		Plant Bowen Dry Gypsum Storage Pacinty			IOTAL DEPTH	151	JRF.ELEV.	_/	31.48	
			Sample No.		Standard Penetration Test					
Depth	Elev.	Material Description, Classification and Remarks	_	From To	Blows	N	Comments	% Red	RQD	
89										
90	641.48	Same as above	S-18	89.5-91	2-7-8	15				
91										
92										
93										
94										
95	636.48	Same as above	S-19	94.5-96	29-15-8	23				
96										
97										
98										
00										
100	004.40	Firm known to white CLAY with and and all	0.00	00 5 404	0.5.9	12				
100	031.48		5-20	99.5-101	2-3-6	13				
101										
102										
103										
104										
105	626.48	Same as above	S-21	104.5-106	1-3-5	8				
106										
107										
108										
109										
110	621.48	Same as above	S-22	109.5-111	2-3-8	11				
111										
112										
113										
114										
115	616.48	Same as above	S-23	114.5-116	2-3-5	8				
116										
117										
118										
119										
120	611.48	Firm, brown CLAY with rock fragments	S-24	119.5-121	1-2-2	4				

sou	HERN	DRILLIN	IG LOG		Hole No. GWA-2				
Energy	COMP a Server Yan	e Warld GEOLOGICA	L SERVI	CES			Sheet 5 of 5		
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	151	JRF.ELEV.	7	31.48
<u> </u>			Sample		Standard Penetration Test				
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
121									
122									
123									
124									
125	606.48	Soft, brown SILT, loose, with rock fragments	S-25	124.5-126	WOR	0			
126									
127									
128									
129									
130	601.48	Same as above	S-26	129.5-131	WOR	0			
131									
132									
133									
134	506 49	Same as above	6.07	124 5 126	WOR	0			
136	590.40		5-27	134.5-130	Work	0			
137									
138									
139									
140	591.48	Same as above	S-28	139.5-141	1-0-0	0			
141									
142									
143									
144									
145	586.48								
146		Rods dropped from 146-150.6							
147									
148									
149									
150	581.48	Top of Rock							
151		Bottom of boring							
152 Form GS	9901 7-26-	2004							

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	DRILLI	NG L	.OG			Hole No.	GWA-2R	ł
Energy	COMP to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 1 of	4	
SITE _		Plant Bowen Dry Gypsum Storage Faci	lity		HOLE DEPTH	103'	SURF.ELEV	. 732	2.66
LOCAT		Cells 1 & 2	COORE	DINATES N	150261	5.38	E207	1965.52	
ANGLE		0 BEARING 0	CONTR	ACTOR	SCS	D	RILL NO. CI	∕IE-550	
DRILLI	NG METHOD	HSA/HQ Rock core with water NO. SAMPLES	3 <u> </u>	15	NO. U.	D. SAMPL	ES	0	
CASING	G SIZE	LENGTH78	CO	RE SIZE	HQ		% REC.	87.2	
WATEF	R TABLE DE	PTH78 ELEV654.66 TI	ME AFTE	R COMP.	15 hrs	DATI	e taken 8/	2/2007	
TYPE G	ROUT	QUANTITY	M	IIX	DRIL	LING STAI	RT DATE	31/2007	
DRILLE	R	S. Milam RECORDER J. Lippert APPRO	VED	Ston	DRIL	LING CON	1P. DATE8/	2/2007	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	732.66								
1									
2									
3									
4									
5	727.66		S-1	4.5-6	2 - 4 - 5	9			
0		Stiff brownish red sandy CLAY with silt, moist, residuum							
6									
7									
8									
9									
10	722.66	Same as above, you stiff with missessus subrounded	S-2	9 5-11	5 - 9 - 11	20			
10	122.00	gravel		0.0 11	0 0 11	20			
11									
12									
13									
14									
15	717 66	Same as above	S-3	14.5-16	4 - 10 - 10	20			
40									
16									
17									
18									
19									
20	712.66	Same as above	S-4	19.5-21	4 - 9 - 10	19			
21									
22									
23									
24									

sou	THERN		Hole No. GWA-2R						
Energy	to Serve You	r Warld GEOLOGICA	AL SE	RVICES			Sheet 2 of	4	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	103	SURF.ELEV.	732	.66
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	707.66	Very stiff brownish yellow with yellowish white SILT, moist, some cementation in yellowish white silt inclusions	S-5	24.5-26	8 - 8 - 12	20			
26									
27									
28									
29									
30	702.66	Same as above, some very fine sand grains in matrix	S-6	29.5-31	2 - 18 - 10	28			
31									
32									
33									
34									
35	697.66	Stiff brownish yellow SILT, wet, very homogeneous	S-7	34.5-36	4 - 5 - 5	10			
36									
37									
38									
39									
40	692.66	Hard brownish vellow and white SILT with highly	S-8	39.5-41	5 - 14 - 21	35			
41		weathered and friable chert gravel, wet							
42									
42									
43									
44				45 5 40					
45	687.66	Firm brownish yellow, yellowish white, and dark brown SILT, moist, elastic in dark brown inclusions	5-9	45.5-40	3 - 3 - 3	6			
46									
47									
48									
49			0.40	40 5 54					
50	682.66	Very stiff yellowish brown SILT with chert gravel, moist	S-10	49.5-51	4 - 13 - 13	26			
51									
52									
53									
54									
55	677.66	Same as above, very hard with abundant chert gravel	S-11	54.5-56	50/4	R			
56								1	

sou	COMP	Hole No.	Hole No. GWA-2R						
Energy.	o Serve You	r World GEOLOG	ICAL SE	RVICES			Sheet 3 of	4	
SITE _		Plant Bowen Dry Gypsum Storage Facili	ty		TOTAL DEPTH	103	SURF.ELEV	732	2.66
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	672.66	Stiff brownish vellow, vellowish white, and dark brown	S-12	59.5-61	3 - 4 -5	9			
61		SILT, moist, elastic where dark brown							
62									
63									
64									
04	007.00		C 12	64 E 66	4 44 45	20			
65	667.66	Same as above, very stiff with rounded gravel, some black stained inclusions	5-15	04.3-00	4 - 14 - 15	29			
66									
67									
68									
69									
70	662.66	Hard yellowish brown sandy SILT, wet	S-14	69.5-71	8 - 14 - 16	30			
71									
72									
73									
74									
75	657.66	Same as above, very hard	S-15	74.5-76	50/4 - X - X	R			
76									
77									
78		Auger refusal at 78.0		70 02			5 0/2 2	40	
79		aphanitic, slightly fractured		10-03			5.0/2.5	40	
80	652.66	79.2-80.7: Cavity, mud-filled							
81		94.0.94.5. Covity, mud filled							
82		81.0-81.5: Cavity, mud-filled				L	ost Circulation		
83				02 00			5 0/4 2		
84				00-00			5.0/4.3	86	
85	647.66								
86									
87									
88	0004 7 00								

sou	THERN		Hole No. GWA-2R						
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES		103	Sheet 4 of	4	
SITE _	1		Sample	Stan		103	SURF.ELEV.	732	.66
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
89		Unweathered, moderately to slightly hactured		00-93			5.0/4.0	96	
90	642.66								
91		High angle (~70° - 75°) healed fractures							
92									
93				93-98			5 0/5 2	104	
94							0.0/0.2	10-1	
95	637.66								
96									
97		Split along high angle joint							
98				98-103			5 0/5 2	104	
99							0.0/0.2	104	
100	632.66								
101									
102									
103		Thin cherty seam at 102.5							
104		Bottom of boning							
105	627.66								
106									
107									
108									
109									
110	622.66								
111									
112									
113									
114	618.66								
115	617.66								
116									
117									
118									
120	612 66								



GWA-3A BORING LOG

PROJECT NUMBER6122160287.2101PROJECT NAMEPlant BowenCLIENTGeorgiaADDRESS317 Covered Bridge Rd SWLOCATIONGypsum Landfill Cells 1 & 2

DRILLING COMPANY Cascade Drilling DRILLER D. Myles RIG TYPE/ METHOD TSI CC150/ SONIC CASING DIA. 6-in Outer/ 4-in Inner BORING DEPTH 139.5 ft COORDINATES N 1502374.48, E 2072061.21 COORD SYS Ga State Plane West (NAD 83) COMPLETION Stick-up w/ protective casing SURFACE ELEVATION 728.68 ft amsl WELL TOC 731.68 ft amsl

COMMENTSStart drilling 2/17/2021 and drilling completed 2/18/2021. Well construction completedLOGGED BYA. Shoreditson 3/16/2021 with installation of well cover and concrete pad.CHECKED BYR. Quinn

LOGGED BY A. Shoredits

Depth (ft)	Samples	% Recovery	Sample Run	Graphic Log	Material Description	nscs	w	ell Diagram	Elevation (ft)
2	0-10		1		Backfill: Clayey SAND, brown/ orange, med. dense, moist, fine gravel, fragments of plastic sheeting	SC			726
- 4									724
6				\bigotimes					722
8									720
10	10-20		2		CLAY, red, v. stiff, low plasticity, dry	CI		Bentonite plug	718
12			-		SAND seam 10-10.1 ft, light brown, med. dense. moist				716
- 14									-714
16					Clayey SILT, red/ yellow, med. dense, dry, coarse gravel, rounded to sub-rounded quartz, relic laminated texture,	ML-SC			712
18					variable clay content throughout Sandy seam 30-30.7 ft, green/ tan				710
20	20-30		3						708
22									706
- 24									704
26									702
28									700
- 30	30-40		4						698
32									696
- 34								mix	694
- 36					Silty CLAY, orange/ white/ yellow/ tan/ red, v. stiff, med. plasticity, moist, trace coarse gravel throughout,	CL			692
- 38					sub-rounded quartz, relic saprolite texture White carbonate seam 36.9-37.1 ft & 43.5 ft Coarse gravel seam @ 40.1 ft 41.5 ft				690
40	40-50		5						686
42									684
46									682
-48					sub-rounded quartz	ML-SC			680
F								\times	-

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 13 Apr 2021

WOOD. GWA-3A BORING LOG

Depth (ft)	Samples	% Recovery	Sample Run	Graphic Log	Material Description	nscs	Well Diagram	Elevation (ft)
50	50-60		6		Sitty CLAY, orange/ white/ yellow, stiff, med. and high plasticity, dry, sub-rounded fine quartz gravel Wht carbonate clay 52.8-53.3 ft, coarse angular carbonate gravel inclusions 50-53.3 ft	CL-CH		678
54					CLAY with silt, red/ orange/ yellow, stiff, med. plasticity, dry, rounded to sub-rounded gravel	CL		674
56					CLAY, red/ orange/ white/ yellow/ tan, v. stiff, high plasticity, dry, relic saprolite texture/ laminations, rounded to sub-rounded gravel	СН		672
58					No sample			670
60	60-70		7		CLAY with sand, brown/ white/ red, stiff, med. plasticity,	CL-SC		668
62					moist, white chert gravel inclusions (fine, sub-angular), relic saprolite structure/ laminations		Bentonite grout mix	666
64					SILT w/ clay, white, med. dense, (non-plastic), dry, chalky,	ML CL-CH		664
66					Silty CLAY, brown/ white/ red/ yellow, stiff, high plasticity, moist, relic saprolite structure			662
68					No sample			660
70	70-80	Γ.	8		SILT with clay, yellow, med. dense, (non-plastic), dry Wht chalky dolomitic 71.1-71.5 ft	ML		658
72					Clayey SILT, white/ red/ yellow, med. dense, (slight plasticity), dry to moist	ML-CL		656
-74					Chert lens @ 81.2 ft			654
76								652
- 78								650
80	80-90		9					648
82								646
84					SILT with clay, white, med. dense, (non-plastic), dry, chalky, dolomitic	ML		644
86					Chert lens 85.3-86 ft Clayey SILT, yellow/ white/ red, med. dense, (slight plasticity) moist chart lens @ 86.8 ft	ML-CL		642
88					SILT with clay, white, med. dense, (non-plastic), dry, trace chalky dolomite	ML-CI		640
90	90-100		10		Clayey SILT, yellow/ white/ red, med. dense, (slight plasticity), moist, white fine gravel inclusions	ML-SC		638
92					Clayey SIL1, tan/ white, med. dense to dense, (med. plasticity), moist, variable clay content, chert lenses throughout		Bentonite plug	636
94					Dark brown chert lens @ 90-90.3 ft Solid chert cobble @ 91.6-91.9 ft			634
96								632
98					Coarse gravel, sub-angular chert in interval of 100-110 ft			630
100	100-110		11					628
102								626
104								624
106								622
108								620

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 13 Apr 2021



Depth (ft)	Samples	% Recovery	Sample Run	Graphic Log	Material Description	nscs	Well	Diagram	Elevation (ft)
110	110-120		12	AN A	No sample from 110-130 ft				618
112	110 120				Thin resistant layer (rock) encountered and broken				616
114					through @ ~125 ft				614
116								Bentonite plug	612
118									610
120	120-130		13	-					608
122									606
124							• •	,	604
126								*0	602
128									600
130	130 140		14		Clavey SILT vellow/ brown loose (low plasticity) wet	MISC) n	598
132	130-140		14		coarse angular gravel inclusions, sub-angular quartz, angular	WIL-OC		Sand pack	596
134					Silty SAND with clay, dark grey/ tan/ dark brown, v. dense, moist, gravelly, weathered and fractured rock (tan/grey sand mixed with coarse chart gravel)	SM-SC		•	594
136					Competent carbonate/ dolomite rock				592
138					yellow, v. dense, moist, gravelly	SM-SC] · · ·	n	590
140					Drilling terminated @ 139.5 ft due to carbonate		· ·		588
142					rock encountered at 135 ft				586
144					Well set at 137.3 feet below ground surface				584
146					Bentonite pellets placed from 75 -123.5 ft due to				582
148					loss of grout.				580
150					Well completed with a stickup protective cover and bollards.				578
152									576
154									574
156									572
158									570
160									568
162									566
164									564
166									562
100									500

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 13 Apr 2021

	WELL INS		N RECORI	<u>D</u>	
JOB NAME Plant Bowe	n Cells 1 & 2		PROJECT NC	o. 6122-16	-0287
WELL NUMBER GWA-3A	l l		INSTALLATIO	N DATE 3/1	6/2021
LOCATION* NORTH: 15023	74.48 EAST: 2072061	.21 GF	ROUND ELEV:	728.68 feet N	AVD88
WOOD FIELD REPRESENTATI	VE A. Shoredits		DRILLER/ CO	NTRACTOR	Cascade
GRANULAR BACKFILL MATER	RIAL #1 Silica Filter San	d	DRILLING TE		otosonic
SCREEN MATERIAL 2-inch I	.D. Flush Joint Slotted P	VC (Sch. 40)	BOREHOLE D		± 6 inch
SLOT SIZE 0.010-ii	nch Machine Cut		REFERENCE	POINT** ELEVA	TION* 731.68 ft NAVD88
RISER MATERIAL 2-inch	I.D. Flush joint Solid PVC	C (Sch. 40)	LOCK TYPE/		aster
* Preliminary-Final location/eleva ** Reference point is notch cut in	tion to be determined by As-Built the top of PVC casing WELL CAP	t Survey N A	NOTE: NOT RE RELATI	TO SCALE, A VE TO EXIST AT	LL DEPTHS RECORDED ING GROUND SURFACE TIME OF INSTALLATION
(approx. 2ft BGS and 3 ft	stickup)			ELL	
CONCRETE WELL PAD		STI	CKUP 0 feet		
(2 ft X 2 ft X 4 inches)					GROUND
DEPTH TO TOP OF BENTONITE SEAL = 119.8 feet initial placement, due to grout loss bentonite extended up to 75 feet bgs	GROUT	LEN SOL = 12	GTH OF RIS ID SECTION 6.8 feet	SER/	TOTAL DEPTH OF WELL = 137.27 FEET
BENTONITE SEAL (N DEPTH TO TOP OF GRANULAR MATERIAL	/lin. 3 feet)		DEPTH TC SCREEN S _= 126.8 fee	DP OF SECTION	STABILIZED WATER LEVEL AFTER DEVELOPMENT =76.30 FEET
= 123.5 feet GRANULAR BAC CENTERING DEVICES II (APPROXIMATE DEPTH	- SCREEN	LEN SLO = 10	GTH OF SC TTED SECT .0 feet DEPTH BC	REEN/ TON	BELOW TOP OF WELL STICKUP MEASURED ON = 3/24/2021
= N/A	SUMP/CAP	$\int_{-\infty}^{-\infty} LEN$	SCREEN \$ _ = 136.8 fee IGTH OF SU 48 feet	SECTION et IMP & CAP	
	······				BOTTOM OF WELL
wood.	Notes: Sand – 6.5 bags of #1 fine sand for w Bentonite – 1 bag 3/8" chips for well s for plug; 8 bags of chips added to plu Grout – 13.5 bags of bentonite mix w Review: <u>RNQ</u>	vell sump, prepack & sump; 1 bucket 1/2" g; 2 bags of chips tc ith ~350 gals water Date: <u>4/13/20</u>	screen interval uncoated pellets above pad	Well Installation F	Record GWA-3A

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	2	DRILLING	LOG				Hole No.	GWA-4R		
Energy	COMP to Serve Yos	ar World [*] GEO	DLOGICAL S	ERVICES	3			Sheet 1	of 4		
SITE _		Plant Bowen Dry Gypsum Stora	ge Facility			HOLE DEPTH	92.5'	SURF.E	ELEV. 740	0.65	
LOCAT		Cells 1 & 2	coc	RDINATES	N	1502246	5.31	E	2072317.15		
ANGLE		0 BEARING 0	CON	TRACTOR		SCS	[DRILL NO.	CME-75		
DRILLING METHOD HSA/HQ Rock core with water NO. SAM				11	1	NO. U.	D. SAMPI	_ES	0		
CASIN	G SIZE	LENGTH		CORE SIZE				% REC.	6 REC.		
WATER	R TABLE DE	ELEV	TIME AF	TER COMP.			DAT	E TAKEN			
TYPE (/PE GROUT QUANTITY MIX DRILLIN					LING STA		3/6/2007			
DRILLE	R	S. Denty RECORDER L. Millet	APPROVED			DRIL	LING CO	MP. DATE	3/13/2007		
Depth	Elev.	Material Description, Classification and Remarks	Sam No	From T	Stand o	dard Penetration Test Blows	N	Comments	% Rec	RQD	
0	740.65										
1											
2											
3											
4											
5	735.65	Orange, red, tan, and light gray clayey SILT, dry	S-	1 4.5-6	6	8-11-13	24		80		
6											
7											
8		1									
0		•									
9											
10	730.65	Red clayey SILT, dry, with 3" limestone lense at l white, dry	bottom, S-	2 9.5-1	1	9-32-34	68		85		
11											
12											
13											
14											
15	725.65	I ight tan and orange silty CLAY, dry, occasional	dark S-	3 14 5-1	16	6-11-17	28		85		
16	1 20.00	red mottling									
10											
17											
18											
19											
20	720.65	Light tan silty CLAY, dry, with carbonate rubble, f	ine S-	4 19.5-2	21	7-12-23	35				
21		dark red mouning									
22											
23											
24											
23 24											

sou	THERN	DRILLI	NG L	.OG			Hole No. GWA-4R		
Energy.	to Serve You	rr World GEOLOGICA	AL SE	RVICES		02.5	Sheet 2 of	4	
SITE -	1		Sample	Stan	. TOTAL DEPTH	92.0	SURF.ELEV.	740	.65
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	715.65	Light orange silty CLAY, dry, occasional dolostone	S-5	24.5-26	3-6-17	23			
26									
27		26.3': drilled through 6" to 8" of rock							
28									
29									
30	710.65	Light orange silty CLAY, moist, occasional light gray	S-6	29.5-31	9-9-9	18		50	
31		and black mottling, occasional dolostone pebbles							
3									
33									
34									
35	705.65	Same as above, large dolostone cobble stuck in bottom	S-7	34.5-36	10-11-9	20		15	
36		of spoon							
37									
38									
39									
40	700.65	Light orange silty CLAY, moist, occasional light grav and	S-8	39.5-41	7-7-9	16		50	
41		black mottling, small carbonate shards							
42									
43		41.6' - 44.0': rock ledge, about 2.5' thick							
44									
45	695.65	Light orange silty CLAY, dry, black mottling, degraded	S-9	44.5-46	8-8-8	16		75	
46		carbonate pebbles							
47									
48									
49									
50	690.65	Brown clayey SILT, moist, occasional black mottling,	S-10	49.5-51	2-4-4	8		20	
51		carbonate pebbles and sand throughout							
52									
53									
54		Same as above	S-11	53.5-56	50/2	R		5	
55	685.65			54-57.5			3.5/2.9	83	
56		54.0: LIGht gray DOLOSTONE, some secondary mineralization in minor fractures							

sou	COMP		Hole No. GWA-4R						
Energy	to Serve You	Plant Bowen Dry Gypsum Storage Facility	JER	VICES		92.5		4 740	65
SITE -		·	Sample	Stan	dard Penetration Test		SURF.ELEV.		.05
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57		56.7': Indication of cavity top, core is incomplete around, some sand mixed in DOLOMITE, some small clay rinds							
58				57.5-67.5			10/5.4	54	
59		58.6' - 59.4': Top of open cavity							
60	680.65	60.0: Pitted DOLOSTONE, thicker clay rinds with some iron							
61									
62									
63									
64									
65	675.65	64.2' - 65.7': Cavity, appears to be some soil deposition at bottom, possible chert about 2" thick							
66									
67		65.7' - 67.2': Gray DOLOMITE, secondary crystalization in minor fractures							
68				67.5-77.5			10/9.9	99	
69									
70	670.65								
71									
72									
73									
74									
75	665.65								
76									
77									
78				77.5-87.5			10/8.6	86	
79		78.0' - 79.3': Cavity, bottom of cavity is heavily weathered (2") DOLOSTONE, tan/orange then gray							
80	660.65	dolostone as above							
81									
82		79.3' - 84.4': Gray DOLOSTONE, same as above							
83									
84									
85	655.65	85.7': Fracture with iron oxide staining and light clay rind							
86									
87									
88 Form GS	9901 7-26-	2004						_	

sou	THERN	Hole No. G	WA-4R						
Energy	COMP to Serve You	ar World GEOLOGI	CAL SE	RVICES			Sheet 4 of 4		
SITE _		Plant Bowen Dry Gypsum Storage Facility	/		TOTAL DEPTH	92.5	SURF.ELEV.	740	.65
Depth	Elev.	Material Description, Classification and Remarks	Sampl No.	e Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
89				87.5-92.5			5.0/5.0	100	
90	650.65	85.7' - 92.5': Light gray DOLOSTONE, same as above,	no						
91		evidence of water in occasional fractures							
02									
92			_						
93		92.5: Bollom of boring							
94									
95	645.65								
96									
97									
98									
99									
100	640.65								
101									
102									
103									
104									
105	635.65								
106									
107									
108									
109									
110	630 65								
111									
112									
112									
114									
115	625 65								
116		1							
117		1							
118									
119									
120	620.65								

			Log update Ground Sur Top of PVC	d with revise face Elevatio Casing Eleva	d survey certified n (feet, NAVD88) tion (feet, NAVD	d 3/23/2021): 740.04 88): 742.84	-	BORING GWA-4RZ PAGE 1 OF 3
SOL	UTHEF	COMPANY SERVICES, INC CIENCE AND ENVIRONMENT). Al engineer	LOG OF T	PROJECT Plant Boc LOCATION Carters	NG owen sville, GA		<u>6122160287</u>
DATE CONT	STAF	RTED <u>10/25/2016</u> COMPL OR <u>Cascade</u>	.ETED <u>10/28/</u> EQ	2016 SURF. UIPMENT <u>PS T-1</u>	ELEV <u>.740.04' NAV[</u> 50 METHOD	088 COORD	INATE <u>S:</u>	N:1502238.85 E:2072329.55
	ED B	Y Tommy and Rodger LOGGE	D BY D. Morri			00 ft baa		BEARING
NOTE	S Ne	ear GWA-4R, *Sample Logged	by geologist	employed by Am	nec Foster Wheeler	SUIL DGS	DELATE	
TH ()	0 DHC				Natural Common		HCL	WELL DATA
Ц Т. Г.	GRAI	WATERIAL DESCRIPTI	ELEV.	44.25	مارستا Gamma م ش	132.75	veak ^{Moderate} RE Strong	Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		- SILT (ML), orange, tan ar (2.5 YR 6/4), loose, dry	nd red					Annular Fill: Aquaguard Grout Mixture
<u>.</u>				MMM	-			
10					-			
· · · · · · ·								
15		- silty CLAY (CL), orange, t red (2.5 YR 6/4)	725.1 tan and	MIN				
				MM				
20				M V M				
					<u> </u>			
25		- same as above, (5 YR 8/2	714.1 2), chert					
		nodules, dry - same as above, (7.5 YR without chert nodules, dry	8/6),	-				
30								
~								
35				MWW				
40		- clayey SILT (ML), mottled tan and black, chert nodule	702.1 d light es, dry					



s	SOUTHERN LOG OF			TEST BORI	NG	BORING GWA-4RZ PAGE 3 OF 3 6122160287
so	UTHER	N COMPANY SERVICES INC		PROJECT Plant B	owen	
EA	RTH SC	CIENCE AND ENVIRONMENTAL ENGINE	ERING	LOCATION Carter	sville, GA	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	44.25	Natural Gamma ഗ ജ	132.75 Veak Moderate REACTION	WELL DATA Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		(Cont.)	5			Annular Seal:
90		- same as above, possible horizontal fractures	1 mar Mar Mar			3/8" bentonite chips
95 100 100 105		- same as above	MAN MMAN			640.0 Annular Seal: (100.0) 3/8" bentonite pellets (non-coated) 635.0 Filter: (105.0)
110 115		- same as above, vertical fractures present				silica filter sand 633.0 (107.0) Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
- - -		Bottom of borehole at 117.0 feet.				
120 120 120 120 120	· · · · · · · · · · · · · · · · · · ·					
	· · · · · · · · · · · · · · · · · · ·					

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	DRILL	ING L	.OG			Hole No.	GWC-5	
Energy	to Serve You	ir World GEOLOGIC	AL SERVICES				Sheet 1 of 4		
SITE _		Plant Bowen Dry Gypsum Storage Fac	ility		HOLE DEPTH	114.2	SURF.	ELEV. 735	5.11
LOCAT		Cells 1 & 2	COORI	DINATES N	150234	1.56	E	2072677.44	
ANGLE BEARING 0			CONTR	RACTOR	SCS DRILL		DRILL NO.	NO	
DRILLI	DRILLING METHOD HSA/HQ Rock core with water NO. SAMPLES			22	NO. U.D. SAMPLES		LES 0		
CASIN	G SIZE	LENGTH	co	RE SIZE	TOTAL %		- % REC.		
WATER	R TABLE DE	PTH ELEV T	IME AFTE	R COMP.	DATE T.		E TAKEN 4/19/2007		
TYPE (ROUT	QUANTITY			DRIL		4/18/2007		
DRILLE	DRILLERS. DentyRECORDERJ. LippertAP			Stan	dard Penetration Test		MP. DATE	.,	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	735.11								
1									
2									
		•							
3									
4									
5	730.11	Very stiff, dark reddish brown sandy CLAY, slightly mois	s-1	4.5-6	6-8-11	19		100	
6									
7									
8									
9									
10	725.11	Same as above	S-2	9.5-11	5-13-15	28		100	
11									
12									
13									
14									
15	720.11	Same as above with black and light brown mottled	S-3	14.5-16	4-8-12	20		100	
16									
17									
10									
10									
19		-							
20	715.11	Same as above	S-4	19.5-21	4-11-15	26		100	
21									
22									
23									
20		1							
24	1								

SOUTHERN DRILLING LOC			OG			Hole No. GWC-5			
Energy to Serve Your World" GEOLOGICA				RVICES		Sheet 2 of 4			
SITE -		Plant Bowen Dry Gypsum Storage Facility	Somela	Stan		114.	SURF.ELEV.	735	.11
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	710.11	Same as above with chert pebbles in matrix, some chert	S-5	24.5-26	3-7-22	29		100	
26		IEIISES							
27									
28									
29									
30	705.11	Hard, brown, red, light brown and black mottled sandy	S-6	29.5-31	8-14-18	32		100	
31		and chert pebbles, slightly moist							
32									
33									
34									
35	700.11	Very stiff, brownish red CLAY, high plasticity, with trace	S-7	34.5-36	7-7-11	18		100	
36									
37									
38									
39									
40	695.11	Very stiff, brown and reddish brown sandy CLAY with	S-8	39.5-41	3-8-21	29		100	
41		moist							
42									
43									
44									
45	690.11	Very stiff, brown silty CLAY with some sandy lenses,	S-9	44.5-46	8-9-10	19		100	
46		moist							
47									
48									
49									
50	685.11	Same as above, brown and reddish brown, wet	S-10	49.5-51	3-7-5	12		100	
51									
52									
53									
54	690.44	Chart lense	S_11	54 5-56	50/F			75	
56	000.11		5-11	04.0-00	50/5			10	

sou	COMP	DRILLI						Hole No. GWC-5		
Energy	to Serve You	r World GEOLOGICA	GEOLOGICAL SERVICES					Sheet 3 of 4		
SITE -	1		Sample	Stan	dard Penetration Test		SURF.ELEV.		.	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD	
57										
58										
59										
60	675.11		S-12	59.5-61	5-4-3	7		0		
61										
62										
63										
64										
65	670.11	Hard, light brown and white clayey SILT, clay content in	S-13	64.5-66	12-13-22	35		100		
66		light brown matrix, very moist								
67										
68										
69										
70	665.11	Same as above, white silt more abundant	S-14	69.5-71	16-25-17	42		100		
71										
72										
73										
74										
75	660.11	Hard, highly weathered and fractured DOLOMITE, wet	S-15	74.5-76	18-33-14	47		100		
76										
77										
78		77.6: Rock seam								
79										
80	655.11	Hard, brown interbedded coarse SAND and silty	S-16	79.5-81	30-13-23	36		75		
81		CLAY, wet								
82										
83										
84										
85	650.11	Very stiff, brown sandy CLAY with chert fragments	S-17	84.5-86	19-13-12	25				
86		nanging nom coalse salid to gravel, wet								
87										
88										
sou	THERN	DRILLI	NG L	OG			Hole No.	GWC-5		
--------	--------------	---------------------------------------------------------------------------	---------------	-----------------	--------------------------------	-------	------------	-------	-----	
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 4 of	4		
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	114.2	SURF.ELEV.	735	.11	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD	
89										
90	645.11	Same as above, hard with highly weathered dolomitic	S-18	89.5-91	14-25-19	44		50		
91		sand								
92										
93										
94										
95	640.11	Hard, highly weathered DOLOMITE, highly fractured,	S-19	94.5-96	21-13-21	34		25		
96		grain size ranging from coarse sand to large gravel, some clay seams, wet								
97										
98										
99										
100	635.11		S-20	99.5-101	17-5-7	12		0		
101										
102										
103										
104										
105	630.11	Very stiff, light brown silty CLAY with white silt	S-21	104.5-106	10-7-10	17		90		
106		ienses, wet								
107	ļ									
108										
109										
110	625.11	Hard, white silty SAND, dolomitic, very fine to medium	S-22	109.5-111	10-14-16	30		75		
111		granteu, wet								
112										
113										
114		Top of rock Bottom of boring	1							
115	620.11									
116										
117										
110										
120	615 11									

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	1	DRILLIN	IG L	OG			Hole No.	(GWC-6	
Energy	COMP to Serve You	ANY world	GEOLOGICA	L SEI	RVICES			Shee	t 1 of	4	
SITE _		Plant Bowen Dry Gypsum	Storage Facili	ty		HOLE DEPTH	109.3	SL	IRF.ELEV.	725	.97
LOCAT		Cells 1 & 2	(COORD	INATES N	1502520	0.08	E	2072	2962.89	
ANGLE		0 BEARING	0 0	CONTR	ACTOR	SCS	C	RILL NO.			
DRILLI	NG METHO	B HSA	NO. SAMPLES		21	NO. U.	D. SAMPL	.ES			
CASING	G SIZE	LENGTH		COF	RE SIZE			% REC.			
WATER	R TABLE DE	PTH ELEV	TIME	AFTER	R COMP.		DAT	E TAKEN		/0007	
TYPE 0	GROUT	QUANTITY		M	IX	DRIL	LING STA	RT DATE	5/1	/2007	
DRILLE	R	S. Denty RECORDER K. Hol	bbs APPROVE	ED	Stan	DRIL	LING CON	MP. DATE	5/1	/2007	
Depth	Elev.	Material Description, Classification and	Remarks	No.	From To	Blows	N	Commen	ts	% Rec	RQD
0	725.97										
1											
2											
3											
4											
5	720.97	Very stiff red sandy SILT crumbly son	ne quartz	S-1	4.5-6	5-8-12	20				
6		pebbles	no quanz								
-											
8											
9	<u> </u>										
10	715.97	Very stiff, red silty gravelly CLAY, dry, c	crumbly, with	S-2	9.5-11	4-6-15	21				
11		dolomite fragments									
10											
12											
13											
14											
15	710.97	Stiff, red-brown to light brown sandy SII	_T, dry,	S-3	14.5-16	3-5-7	12				
16		crumbly, with clay seams & some weath dolomite fragments	hered								
17											
18											
19											
20	705.97	Stiff, light brown SILT, moist, 1.5" thick	white dolomite	S-4	19.5-21	5-7-6	13				
21		lense									
22											
23											
24											

sou	THERN	DRILLI	NG L	OG			Hole No.	GWC-6	
Energy	to Serve You	In World" GEOLOGIC	AL SE	RVICES		109	Sheet 2 of	4	- 07
SITE	1		Sample	Star		103.	SURF.ELEV.	725).97 I
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	700.97	Very stiff, light brown SILT, slightly moist	S-5	24.5-26	3-10-8	18			
26									
27									
28									
29									
30	695.97	Very stiff, sandy SILT, moist, banded light brown,	S-6	29.5-31.0	3-8-11	19			
31		brown, and red brown							
32									
33									
34									
35	690.97	Very stiff, light brown sandy SILT, moist, some white	S-7	34.5-36	6-7-13	20			
36		dolomite fragments							
37									
38									
39									
40	685.97	Same as above, wet, some quartz fragments	S-8	39.5-41	7-8-10	18			
41									
42									
43									
44									
45	680.97	Hard, white SILT, wet, with layers of light brown	S-9	44.5-46	4-9-38	47			
46		weathered dolomite							
47									
48									
49									
50	675.97	Hard, white gravelly SILT, wet, some bands of light	S-10	49.5-51	19-39-19	58			
51		brown, quartz fragments							
52									
53									
54									
55	670.97	Stiff, light brown sandy gravelly SILT, wet, fragments	S-11	54.5-56	6-6-8	14			
56		of weathered dolomite, veins of mostly pure sand							

sou	THERN	DRIL	LING L	OG			Hole No.	GWC-6	
Energy	to Serve You	r World GEOLOG	ICAL SE	RVICES			Sheet 3 of	4	
SITE		Plant Bowen Dry Gypsum Storage Facili	ty	0		109.3	3 SURF.ELEV.	725	.97
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	665.97	Stiff, light brown sandy SILT, wet, some dolomite	S-12	59.5-61	8-7-8	15			
61		fragments							
62									
63									
64									
65	660.07	Ctiff light brown CILT, wat with group!	S 12	64 5 66	469	14			
60	000.97	Sun, light brown Sich, wet, with graver	5-15	04.5-00	4-0-0	14			
66									
67									
68									
69									
70	655.97	Stiff, light brown gravelly SILT, one band of quartz	S-14	69.5-71	7-5-7	12			
71									
72									
73									
74									
75	650.97	Stiff, light brown SILT, wet, some banding and quartz	S-15	74.5-76	6-10-10	20			
76		nagments							
77									
78									
79									
80	645.97	Stiff, light brown SILT, wet, with black/gray chert,	S-16	79.5-81	5-6-9	15			
81		banding, chert and quartz fragments							
82									
83									
84									
85	640.97	Very stiff, light brown to reddish brown sandy SILT,	S-17	84.5-86	8-3-24	27			
86		wet, with chert fragments							
87									
88									

sou	THERN	DRILLI	NG L	.OG			Hole No.	GWC-6	
Energy	to Serve You	r World GEOLOGIC/	AL SE	RVICES			Sheet 4 of	4	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	109.	3 SURF.ELEV.	725	.97
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
89									
90	635.97	Medium stiff, light brown clayey SILT, wet, red	S-18	89.5-91	2-3-3	6			
91		mottling, some chert tragments							
92									
93									
94									
95	630.97	Soft, light brown silty CLAY, saturated, with some	S-19	94.5-96	2-2-2	4			
96		sandy bands							
97									
98									
99									
100	625.97	Soft, light brown silty CLAY, saturated, with few	S-20	99.5-101	0-1-2	3			
101		TOCK magnitudes							
102									
103									
104									
105	620.97	Light brown clayey sandy SILT, with rock fragments	S-21	104.5-106	1-1-15	16			
106									
107									
108									
109		Top of rock							
110	615.97	bottom of boring							
111	<u> </u>								
112									
113									
114									
115	610.97								
116									
117									
118									
120	605.97								

			Log updated with revised Ground Surface Elevation	survey certified 3/	/23/2021 28.66		
SOUT	HERN	2	Top of PVC Casing Elevat		: 731.91		WELL: GWC-6RZ PAGE 1 OF 3 <u>841443</u>
	COMP			PROJECT Plant F	Bowen Cells 1 & 2	Replacen	nent Wells
EARTH S	CIENCE A	AND ENVIRO	JES, INC. DNMENTAL ENGINEERING	LOCATION Carter	rsville, GA		
DATE STAR	TED <u>4/22</u>	<u>2/2015</u> C	OMPLETED _4/28/2015 SU	RF. ELEV. <u>728.66</u>		ES: N:1	502502.00 E:2072900.50
	UR <u>Caso</u>		EQUIPMENT			NGI F	BEARING
BORING DE	PTH <u>110</u>			G _48.5 ft COMP.	71.7 ftD	ELAYED	73.9 ft. after 100 hrs.
NOTES TO	C Elevatio	on 731.91, So	nic Drilling - 7"OD Casing in Ove	erburden, 6"OD Casin <u>c</u>	in Rock, 4"OD Co	ore	
BOREHOLE	(t)		WELL DAT	Α			COMMENTS
DATA	HT .	Surfac	e:				
	DEP	protect	ive aluminum cover with bollard	s; 4-foot square concre	te pad		
ELEV. Strata						ELEV. (DEPTH)	
	···· 0						
		,	rface Seal: Concrete				
						725.2 (3.5)	
	2						
720.7							
	2						
715.7							
	i						
	3	Ar	inular Fill: Portland Cement-Ben	tonite Grout (24 - 47lbs	bags PC. 2.5 -		
		50	lbs bags Gel, 135 gal. Water)				
	Si Si						
701.7							
	Ē						
695.7							
	ř						
690.7							

WELL: CAUCE-RATE Image: Construction Image: Construction <thimage: construction<="" th=""> Image: Constructi</thimage:>				
Description WELL CONSTRUCTION MULTIFEN COMPANY SERVICES, INC. BARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECTPlant Bowen Cells 1 & 2 Replacement Wells BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun COMMENTS BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun Commun BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun Commun BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun Commun BORENCE BATA Surface: protective aluminum cover with boliands; 4-foot square concrets pad commun Commun BORENCE Surface: protect			RECORD OF	WELL: GWC-6RZ PAGE 2 OF 3
SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND EVVIRONMENTAL ENGINEERING PROJECT Plant Bowen Cells 1 & 2 Replacement Wells INC. INC. COMMENTS INC. INC. INC. INC. INC. INC.	SOUT	COM	WELL CONSTRUCTION	<u>841443</u>
EXRITISCIENCE AND LEVERONMENTAL ENCINEENTS LOCATION Cattereville, GA SOURCE SUPPORT Surface: protective aluminum cover with bollards; 4-foot square concrete pad COMMENTS GEN 0000 Contractive (CDTHM Comments COMMENTS G85.7 9	SOUTHE	ERN CON	MPANY SERVICES, INC. PROJECT Plant Bowen Cells 1 & 2 Repl	acement Wells
BORNOLE E Well DATA COMMENTS Surface: protective aluminum cover with boliards; 4-foot square concrete pad 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 085.7 9 0 0 095.7 9 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 095.7 0 0 0 0 0 <td< th=""><th>EARIHS</th><th></th><th>E AND ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA</th><th></th></td<>	EARIHS		E AND ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA	
Bit No. Bit Bit Portantian Bit No. Bit Bit Portant Bit No. Bit Portant Bit		(ft)	WELL DATA	COMMENTS
2 CLV. 800 0 CLV 980.7 9 0 0 0 980.7 9 0 0 0 0 980.7 9 0 0 0 0 0 980.7 9 0 0 0 0 0 0 980.7 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <td< th=""><th></th><th>EPTH</th><th>Surface: protective aluminum cover with bollards; 4-foot square concrete pad</th><th></th></td<>		EPTH	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
386.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7 9 380.7	ELEV. Strata		CONTINUED) (DEP	EV. TH)
Annular Fill: Portland Cement-Bentonite Grout (24 - 47lbs bags PC, 2.5 - 50lbs bags Gel, 135 gal. Water)	MELLIG			
986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 986.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 9 987.7 <td< th=""><th>MUCUB</th><th>4</th><th></th><th></th></td<>	MUCUB	4		
980.7 12 980.7 13 975.7 14 975.7 15 980.7 15 975.7 15 975.7 15 98 135 970.7 15 98 135 98 135 98 135 98 135 98 135 98 135 98 135 98 135 98 135 99 136 99 137 90 138 91 139 92 139 93 139 94 139 95 139 96 139 97 139 98 139 99 139 99 139 99 139 99 139 99 139 99 139 99 139	685.7			
880.7 9 675.7 9 970.7 9 985.7 9 985.7 9 98 9 970.7 9 98 9 970.7 9 98 9 98 9 99 9 90 9 98 9 99 9 90 9 91 9 92 9 93 9 94 9 95 9 96 9 97 9 93 9 94 9 95 9 95 9 96 9 97 9 98 9 99 9 90 9 91 9 92 9 93 9 93 9 94 9		م ا		
880.7		4		
Annular Fill: Portland Cement-Bentonite Grout (24 - 47/lbs bags PC, 2.5 - 50lbs bags Gel, 135 gal. Water) 670.7 665.7 665.7 661.2 (67.5) Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (83.1'-76.0')) and Barold Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5')) 660.7 661.2 (67.5) 661.2 (67.5)	680.7 J			
Annular Fill: Portland Cement-Bentonite Grout (24 - 47lbs begs PC, 2.5 - 50lbs begs Gel, 135 gal. Water) 665.7 665.7 661.2 (67.5) Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (3.1-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0-67.5'))				
Annular Fill: Portland Cement-Bentonite Grout (24 - 47lbs bags PC, 2.5 - 50lbs bags Gel, 135 gal. Water) 665.7 8 665.7 8 665.7 8 665.7 8 8 8 8 8 8 8 8 8				
50lbs bags Gel, 135 gal. Water) 50lbs bags Gel, 135 gal. Water) 665.7 665.7 665.7 661.2 (67.5) 661.2 (67.5) 8 650.7 8 8 650.7 8 8 8 8 8 8 8 8 8 8 8 8 8	675.7		Annular Fill: Portland Cement-Bentonite Grout (24 - 47lbs bags PC, 2.5 -	
670.7 665.7 665.7 665.7 665.7 665.7 665.7 665.7 661.2 (67.5) 661.2 (67.5) 661.2 (67.5) 661.2 (67.5)		ц.	50lbs bags Gel, 135 gal. Water)	
670.7 665.7 665.7 661.2 (67.5) 661.2 (67.5) 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5 67.5				
665.7 665.7 666.2 (67.5) 661.2 (67.5) 661.2 (67.5) 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7 650.7	670.7			
665.7				
665.7 665.7 661.2 (67.5) 661.2 (67.5) 661.2 (67.5) 661.2 (67.5) 661.2 (67.5)				
661.2 (67.5)	665.7			
661.2 (67.5)				
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))				
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))	0.09.24		66'	1.2
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))		22		
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))	ADE-IGL			
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))				
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))	- ESEE	75		
			Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (93.1'-76.0')) and Baroid Hole Plug 3/8 Chips (4 - 50lbs bags (76.0'-67.5'))	
	650.7			
		80		
			↓ ↓	
645.7	645.7			

(Continued Next Page)

SOUTHERN COMPANY SOUTHERN COMPANY	RECORD OF WELL CONSTRUCTION Y SERVICES, INC. PROJECT Plant Bowen Cells 1 & 2 Replaceme	WELL: GWC-6RZ PAGE 3 OF 3 841443 ent Wells
	ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA WELL DATA Surface: protective aluminum cover with bollards; 4-foot square concrete pad	COMMENTS

PLAC		Log updated with revised survey certifi	ed 3/	/23/2021 /28 66	
1 & 2 RE	10.1	Top of PVC Casing Elevation (feet, NAV	/D88)	B): 731.91 BORING GWC-6F PAGE 1 0	RZ F 3
SC CELLS	UTI	LOG OF TEST BOR	ING	G <u>8414</u>	<u>443</u>
SOI	JTHER	N COMPANY SERVICES, INC. PROJECT Plant	Bower	en Cells 1 & 2 Replacement Wells	
EAR	TH SC	EXERCE AND ENVIRONMENTAL ENGINEERING LOCATION Cart	ersville	le, GA	
	START	ED 4/22/2015 COMPLETED 4/28/2015 SURF. ELEV. 728.66	c	COORDINATES: N:34.128150 E:-84.905832	
	RACTO	R Cascade Drilling EQUIPMENT 7868 METHOD	Soni	nic; SPT	
	ED BY	_J. SiglerLOGGED BY _B. Smelser CHECKED BY		ANGLE BEARING	
	NG DEF S TO	C Elevation 732.91. Sonic Drilling - 7"OD Casing in Overburden. 6"OD Casin	7. <u>71.</u> na in R	1.7 tt DELAYED	
ELLS			. <u>g</u>	· · · · · · · · · · · · · · · · · · ·	
DEPTH (ft)	SRAPHIC LOG	MATERIAL DESCRIPTION	Ite HCL REACTION	COMMENTS	
VENICC			Weak Modera Strong		
LS/BOV	Ш	Elastic Silt (MH)			
SOJEC	Ш				
	Ш	- dark red (10R 3/6) fill dry, very stiff, low plastic, clayey, some white to		SPT N=28bpf(@3ft.)	
	Ш	light gray brittle/mable dolomite tragments		10/12/16	
PPORT	Ш				
CH SU		Lean Clay (CL)		SPT N=27bpf(@8ft.)	
		residuum dry, very stiff, low to medium plastic, trace organics and rock fragments		8/13/14	
		Elastic Silt (MH)		SPT N=26bpf(@13ft.)	
15		 mottled red / moderate reddish brown (10R 4/6) and brownish yellow / dark yellowish orange (10YR 6/6) residuum dry, very stiff, clayey silt, abundant light gray to white, angular to subangular, medium to very coarse dolomite fragments, trace interbedded clay layers 		7/12/14	
C GEN	Ш			SPT N=11bpf(@18ft.)	
		 mottled red / moderate reddish brown (10R 4/6), strong brown (7.5YR 4/6) and yellow (10YR 7/6) residuum moist, stiff, low plastic, clayey silt, decrease in rock fragments 		3/5/6	
S:WOF	Ш				
25		 mottled yellow (10YR 7/8) and red (2.5YR 4/6) residuum moist, very stiff, low plastic, clayey silt with interbedded zones of increased clay, abundant medium to coarse, angular light gray dolomite fragments, trace light gray clay streaks 		3/7/9	
- 105		Lean Clay (CL)			
06 DALABASE		- mottled yellow (10YR 7/8) and red (2.5YR 4/6) residuum moist, stiff, low to medium plastic, trace angular to subangular, coarse to very coarse dolomite and chert fragments		SPT N=9bpf(@28ft.) 3/4/5	
)G - E(
35 35		Elastic Silt (MH) - mottled yellowish red (5YR 5/8) and yellow (10YR 8/8) residuum moist, stiff, low plastic, interbedded zones of red CL and yellow ML		SPT N=10bpf(@33ft.) 3/5/5	
SIA					



LOG OF TEST BORING

SUTTHER COMPANY SERVICES, INC. PROJECT _ Plant Boxen Cells 1 & 2 Replacement Weils EARTH SCIENCE AND ENVIRONMENTALENGINEERING LOCATION Cattersville, GA Image: Service Company Services Company Serv	sc	DUT		OG OF	TEST BO	RING	G	BORING GWC-6RZ PAGE 2 OF 3 <u>841443</u>
Bits Bits Attende Bits SPT N=13bpf(@38h.) 10	SOL EAR	JTHE TH S	RN COMPANY SERVICES, INC. CIENCE AND ENVIRONMENTAL ENGIN	EERING	PROJECT <u>Pla</u>	nt Bowe	en Cells 1 & 2 Replac le, GA	ement Wells
a0 Lean Clay (CL) SPT N=13bpf(@38R.) a0 - Intilled red (2,5YR 4/8) and reddish brown / moderate brown (5YR 4/4) esiduum moist, stiff, low to medium plastic, trace angular, coarse to very coarse dolomite fragments 3/6/7 3/6/7 Silly Clay (CL-ML)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCR	IPTION	ELEVATION	Weak HCL Moderate REACTION	Strong	COMMENTS
Sity Clay (CL-ML) SPT N=19bpf(@43ft.) 45 Set (010 - 40 wind rediable yellow (7.5YR 7/8) residuum moist.very sit, non to medium plastic. sit (277 7/8) residuum moist.very sit, non blastic. bit (178 7/8) residuum moist.very sit, non blastic. bit (179 7/8) residuum wet, medium sitf. low to medium plastic. 12/12/7 50 Sandy Lean Clay (CL) - yellow (101YR 7/8) residuum wet, medium sitf. low to medium plastic, include dery dark brown / dusky yellowish brown (101YR 2/2) and very light gray (18) residuum wet, very sitf. low plastic, abundant light gray to light gray (18) residuum wet, very sitf. low plastic, abundant light gray to light forw, inceidum to very coarse angular chert fragments SPT N=28bpf(@53ft.) 55 Sity Clay (CL-ML) SPT N=28bpf(@65ft.) 56 Sity Clay (CL-ML) SPT N=28bpf(@65ft.) 57 Sity Clay (CL-ML) SPT N=28bpf(@65ft.) 58 Sity Clay (CL-ML) SPT N=17bpf(@65ft.) 59 - mottled very dark brown / moderate yellowish brown (10YR 5/4) and yellow (10YR 6/8), while (10YR 8/4) and red (2.5YR 5/8) residuum wet, very sitf. low to medium plastic, trace medium to coarse dolonite fragments SPT N=17bpf(@65ft.) 59 - mottled rediaish yellow (7.5YR 6/8), yellow / pale yellowish orange (10YR 6/8), while (10YR 8/4) and red (2.5YR 5/8) residuum wet, wery sitf. low to medium plastic, trace submunded, medium to coarse dolonite fragments and white to light gray chert fragments SPT N=25bpf(@65ft.) 70 - mottled reddish yellow (40		Lean Clay (CL) - mottled red (2.5YR 4/6) and reddish bi 4/4) residuum moist, stiff, low to medium very coarse dolomite fragments	rown / modera plastic, trace	ate brown (5YR angular, coarse t	0	SPT N=13bpf(@38 3/6/7	3ft.)
2 Sandy Lean Clay (CL) -yellow (10YR 78) residuum wet, medium stiff, low to medium plastic, interbedded zones of fine silty sand, cohesive, can roll 4-6mm, no visible rock fragments 1/2/5 90 Elastic Sit (MH) -mottled very dark brown / dusky yellowish brown (10YR 2/2) and very light dray (N8) residuum wet, very stiff, low tosis, cabundant light gray tob light dray (N8) residuum wet, very stiff, low tosis, cabundant light gray tob light dray (N8) residuum wet, very stiff, low to medium plastic, trace medium rock fragments SPT N=28bpf(@53ft.) 28/14/14 90 Sitty Clay (CL-ML) -mottled redicitsh yellow (7.5YR 6/8), yellow / pale yellowish orange (10YR 8/8) and red (2.5YR 6/8) residuum wet, very stiff, low to medium plastic, silly, trace light gray to white, medium to coarse, angular to subongular dolomite fragments SPT N=17bpf(@63ft.) 4/8/9 90 -mottled torowish yellow (10YR 8/1) and red (2.5YR 6/8), reduim to coarse, angular to subongular dolomite fragments SPT N=25bpf(@63ft.) 4/8/9 91 -mottled redicish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=25bpf(@73ft.) 1/4/4 90 Sitt (MU) -mottled redicish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular cher	45		Silty Clay (CL-ML) - trace mottling white / pinkish gray (5YR brown (10R 4/6) and reddish yellow (7.5' stiff, non to medium plastic, silt grading to silt, low to medium plastic red clay, trace subangular, brittle/friable, medium to coa	8/1), red / mo YR 7/8) resic o silty clay, no light gray and rse dolomite	oderate reddish Juum moist, very on plastic light gra d angular to fragments	y	SPT N=19bpf(@43 12/12/7	3ft.)
Elastic Silt (MH) Provided very dark brown / dusky yellowish brown (10YR 2/2) and very high gray (NB residuum wet, very stiff, low plastic, abundant light gray to hight brown, medium to very coarse angular chert fragments SPT N=28bpf(@53ft.) 55 Silty Clay (CL-ML) SPT N=9bpf(@58ft.) 60 - mottled yellowish brown / moderate yellowish brown (10YR 5/4) and yellow (10YR 7/8) residuum wet, stiff, low to medium plastic, trace medium rock fragments SPT N=9bpf(@58ft.) 60 - mottled reddish yellow (7.5YR 6/8), yellow / pale yellowish orange (10YR 8/6) and red (2.5YR 5/8) residuum wet, very stiff, low to medium plastic, trace input gray to white, medium to coarse, angular to subangular doiomite fragments SPT N=25bpf(@66ft.) 65 - mottled brownish yellow (10YR 6/8), while (10YR 8/1) and red (2.5YR 5/8) residuum wet, very stiff, low to medium plastic, trace subangular to subangular to coarse doiomite fragments and white to light gray cheft fragments SPT N=25bpf(@66ft.) 76 Y - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular cheft fragments and white to light gray cheft fragments SPT N=25bpf(@73ft.) 77 - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments SPT N=25bpf(@73ft.) 76 Sitt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff. trace interbedded clay and rock fragments <	50		Sandy Lean Clay (CL) - yellow (10YR 7/8) residuum wet, mediu interbedded zones of fine silty sand, cohe rock fragments	im stiff, low to esive, can roll	o medium plastic, l 4-6mm, no visibl	e	SPT N=7bpf(@48f 1/2/5	t.)
Silty Clay (CL-ML) - motified yellowish brown / moderate yellowish brown (10YR 5/4) and yellow (10YR 7/8) residuum wet, stiff, low to medium plastic, trace medium rock fragments SPT N=9bpf(@58ft.) 2/3/6 Lean Clay (CL) - motified reddish yellow (7.5YR 6/8), yellow / pale yellowish orange (10YR 8/6) and red (2.5YR 5/6) residuum wet, very stiff, low to medium plastic, silty, trace light gray to white, medium to coarse, angular to subangular dolomite fragments SPT N=17bpf(@63ft.) - mottled brownish yellow (10YR 6/8), white (10YR 8/1) and red (2.5YR 5/8) residuum wet, very stiff, low to medium plastic, trace subangular to subrounded, medium to coarse dolomite fragments and white to light gray chert fragments SPT N=25bpf(@68ft.) Z - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) 75 Z - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) 80 Sitt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments SPT N=25bpf(@78ft.)	_55	<u> </u>	Elastic Silt (MH) - mottled very dark brown / dusky yellowis light gray (N8) residuum wet, very stiff, lo light brown, medium to very coarse angul	sh brown (10` w plastic, abu ar chert fragr	YR 2/2) and very undant light gray t ments	0	SPT N=28bpf(@53 28/14/14	3ft.)
Lean Clay (CL) - mottled reddish yellow (7.5YR 6/8), yellow / pale yellowish orange (10YR 8/6) and red (2.5YR 5/6) residuum wet, very stiff, low to medium plastic, silty, trace light gray to white, medium to coarse, angular to subangular dolomite fragments 4/8/9 - mottled brownish yellow (10YR 6/8), white (10YR 8/1) and red (2.5YR 5/6) residuum wet, very stiff, low to medium plastic, trace subangular to subrounded, medium to coarse dolomite fragments and white to light gray chert fragments SPT N=25bpf(@68ft.) ✓ - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) ✓ - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) 75 Sitt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments SPT N=25bpf(@78ft.) 80 Sitt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments 4/15/10	60		Silty Clay (CL-ML) - mottled yellowish brown / moderate yell yellow (10YR 7/8) residuum wet, stiff, low medium rock fragments	owish brown ⁄ to medium p	(10YR 5/4) and plastic, trace		SPT N=9bpf(@58f 2/3/6	t.)
- mottled brownish yellow (10YR 6/8), white (10YR 8/1) and red (2.5YR 5/8) residuum wet, very stiff, low to medium plastic, trace subangular to suborounded, medium to coarse dolomite fragments and white to light gray chert fragments SPT N=25bpf(@68ft.) ✓ - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) 75 ✓ - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments SPT N=8bpf(@73ft.) 80 Silt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments SPT N=25bpf(@78ft.)	65		Lean Clay (CL) - mottled reddish yellow (7.5YR 6/8), yell (10YR 8/6) and red (2.5YR 5/6) residuu plastic, silty, trace light gray to white, mer subangular dolomite fragments	ow / pale yell m wet, very s dium to coars	lowish orange tiff, low to mediun se, angular to	ו	SPT N=17bpf(@63 4/8/9	3ft.)
 - mottled reddish yellow (7.5YR 6/6), reddish yellow (7.5YR 7/8) and red (2.5YR 5/8) residuum wet, medium stiff, low to medium plastic, trace coarse angular to subangular chert fragments and dolomite fragments Silt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments 	70		 mottled brownish yellow (10YR 6/8), wf 5/8) residuum wet, very stiff, low to medi subrounded, medium to coarse dolomite gray chert fragments 	hite (10YR 8/ um plastic, tr fragments an	1) and red (2.5YF race subangular to nd white to light	8	SPT N=25bpf(@68 4/10/15	3ft.)
Silt (ML) - mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum wet, very stiff, trace interbedded clay and rock fragments SPT N=25bpf(@78ft.) 4/15/10	75			dish yellow (7 low to mediu lents and dole	7.5YR 7/8) and re m plastic, trace omite fragments	d	SPT N=8bpf(@73f 1/4/4	t.)
	80		Silt (ML) - mottled yellowish red (5YR 5/8) and ye very stiff, trace interbedded clay and rock	ellow (10YR 7 fragments	7/8) residuum wet,		SPT N=25bpf(@78 4/15/10	3ft.)



so	OUTH	Log updated with revised survey certi Ground Surface Elevation (feet, NAVD Top of PVC Casing Elevation (feet, NA LOG OF TEST BO	fied 3/23/20 88): 709.70 VD88): 713 . RING	04 BORI	NG GWC-7 Z PAGE 1 OF 3 <u>GPC633179</u>
SOU EAF	UTHERN RTH SCIE	COMPANY SERVICES, INC. PROJECT ENCE AND ENVIRONMENTAL ENGINEERING LOCATION _Pla ED_5/12/2016 COMPLETED _5/19/2016 SURF. ELEV709.70	dfill Replacement Ant Bowen	ent Monitoring Wells DINATES: _N:1502640.13	E:2073193.22
CONT DRILL	IRACTOR	R_Cascade EQUIPMENTTrackedMETHO J. Asua LOGGED BY _W. ShaughnessyCHECKED BY _B	D Rotosonic	ANGLE	BEARING
BORI NOTE	NG DEPT	TH_127.5 ft. GROUND WATER DEPTHDURING 75 ft. COI	MP. <u>55 ft</u> .	DELAYED _55 ft. aft	er 24 hrs.
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	veak looerate HCL itrong	COMMENTS	Natural Gamma
· · · · · · · · · · · · · · · · · · ·		Sandy Silt (ML) - dark yellowish brown (10YR 4/6) dry - dark grayish brown / dark yellowish brown (10YR 4/2)			
5		- light brownish gray / pale yellowish brown (10YR 6/2) - mottled strong brown (7.5YR 4/6) and light gray (2.5Y 7/2) dry			
15		- mottled strong brown (7.5YR 5/6) and red (2.5YR 4/6) dry to damp increased sand content than above	b		
25 30		- damp Sandy Lean Clay (CL) - dark red (2.5YR 3/6) damp, with fine angular gravel - medium			
35		- mottled red (2.5YR 4/6), pale brown (10YR 6/3) and white (2.5YR 8/1) hard			



LOG OF TEST BORING



so	DUTH	LOG OF TEST BOR	BRING	ORING GWC-7 Z PAGE 2 OF 3 <u>GPC633179</u>
SOU EAF	UTHERN RTH SCII	I COMPANY SERVICES, INC. PROJECT Landf ENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	fill Replacement Monitoring Well t Bowen	<u>S</u>
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Veak Noderate REACTION Strong REACTION	Natural Gamma
45		Sandy Lean Clay (CL)(Con't) - mottled pale yellow (5Y 8/2), pinkish gray / grayish orange pink (5YR 7/2) and yellowish red / light brown (5YR 5/6) damp, hard, with fine angular gravel		
50		- increased gravel content than above, weathered chert		
<u>55</u> 60		Well-graded Sandy Gravel (GW) - light gray (5YR 7/1) coarse chert gravel ▼ Sandy Fat Clay (CH) - mottled yellowish brown (10YR 5/6) and red (2.5YR 5/8) moist, high - pale yellow (2.5Y 8/3) moist, fine to coarse weathered chert gravel - mottled yellow (10YR 7/6), red (2.5YR 5/8) and reddish yellow (7.5YR 6/6)		
<u>65</u> 70		- mottled brownish yellow / dark yellowish orange (10YR 6/6), white (10YR 8/1) and red (2.5YR 5/8) fine to coarse chert gravel (sub- rounded and angular)		
75		 ✓ - light gray (10YR 7/1) angular chert gravel - red (2.5YR 5/8), brownish yellow (10YR 6/8) and white (10YR 8/1) wet, high, fine angular gravel, light gray chert cobbles 		
80		- increased sand content than above		

(Continued Next Page)



LOG OF TEST BORING



sc	OUTH	LOG OF TEST BOR	RING	BORI	NG GWC-7 Z PAGE 3 OF 3 <u>GPC633179</u>
SOL Ear	JTHERN	COMPANY SERVICES, INC. PROJECT Land ENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	fill Replacen	nent Monitoring Wells	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	leak HCL loderate REACTION trong	COMMENTS	Natural Gamma
90		Sandy Fat Clay (CH)(Con't) Elastic Silt (MH)	<u>> ≥ 0</u>		
		 mottled brownish yellow (10YR 6/8) and red (2.5YR 4/6) wet, high red (2.5YR 4/6) medium stiff, medium, with dark gray chert cobbles 			
95		- mottled brownish yellow (10YR 6/8) and red (2.5YR 4/6) high, with sand and fine gravel			
100		- mottled red (2.5YR 4/6), white (2.5YR 8/1) and pale brown (10YR 6/3)			
105		- yellowish brown (10YR 5/8) soft			
		Clayey Sand (SC) - dark yellowish brown (10YR 4/6) with fine to coarse chert gravel			
110					
115					
120					
		- chert gravel and sand			
125					
	1	Bottom of borehole at 127.5 feet.			
130					
130					

RECORD OF	WELL: GWC-7 Z PAGE 1 OF 3
	<u>GPC633179</u>
COMPANY WELL CONSTRUCTION PROJECT Landfill Replacement Monitoring Well	lls
SOUTHERN COMPANY SERVICES, INC. Image: Southern Company, Image:	
DATE STARTED <u>5/12/2016</u> COMPLETED <u>5/19/2016</u> SURF. ELEV. <u>709.70</u> COORDINATES: <u>N:1502</u>	2640.13 E:2073193.22
CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE	BEARING
BORING DEPTH <u>127.5 ft.</u> GROUND WATER DEPTHDURING <u>75 ft.</u> COMP. <u>55 ft.</u> DELAYED <u>55</u>	55 ft. after 24 hrs.
	COMMENTS
Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
ELEV. Strata (DEPTH)	
Surface Seal: Concrete 707.7 (2.0)	
Well: 2" OD PVC (SCH 40)	
Annular Fill: Bentonite Grout (3 - 50lbs bags Aguagaurd, 80 gal, water)	

SOUTHERN COMP SOUTHERN COMI EARTH SCIENCE A	ANY SERVICES, INC. ND ENVIRONMENTAL ENGINEERING RECORD OF WELL CONSTRUCTION PROJECT Landfill Replacement Monitoring LOCATION Plant Bowen	WELL: GWC-7 Z PAGE 2 OF 3 GPC633175
	WELL DATA Surface: protective aluminum cover with bollards; 4-foot square concrete pad	COMMENTS
ELEV. Strata (CONT 655.7 655.7 655.7 655.7 655.7 6 6 6 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7	Annular Fill: Bentonite Grout (3 - 50lbs bags Aquagaurd, 80 gal. water) 654.7 (55.0) Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (1 - 5gal bucket (101.0°-99.0') and Barold Hole Plug 3/8 Chips (11.5 - 50lbs bags (99.0°-55.0')	



6\GWC-07\BOWEN LANDFILL REPLAC

RECORD OF WELL CONSTRUCTION



SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Landfill Replacement Monitoring Wells

LOCATION Plant Bowen

BOREHOLE	H (ft)	WELL DATA		COMMENTS
	DEPTH	Surface: protective aluminum cover with bollards; 4-foot square concrete pad		
	125 125 120 115 115 110 125 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 <th>Annular Sea: Pel-Plug 3/8 Bentonite Coated Pellets (1 - 5gal bucket (101.0'-99.0') and Baroid Hole Plug 3/8 Chips (11.5 - 50lbs bags (99.0'-55.0') Filter: Filter Media 20/40 Silica Sand (9 - 50 lbs bags, 116.0'-103.0') then 30/40 Silica Sand (0.5 bag, 103.0'-101.0.0') Screen: 10 ft. 0.010'' Slot Prepack Sump:0.30 ft. Backfill:Baroid Hole Plug, 3/8'' chips, 127.5'-116.0', (3-50lbs bags)</th> <th>608.7 (101.0) 606.0 (103.7) 595.7 (114.0) 593.7 (116.0)</th> <th></th>	Annular Sea: Pel-Plug 3/8 Bentonite Coated Pellets (1 - 5gal bucket (101.0'-99.0') and Baroid Hole Plug 3/8 Chips (11.5 - 50lbs bags (99.0'-55.0') Filter: Filter Media 20/40 Silica Sand (9 - 50 lbs bags, 116.0'-103.0') then 30/40 Silica Sand (0.5 bag, 103.0'-101.0.0') Screen: 10 ft. 0.010'' Slot Prepack Sump:0.30 ft. Backfill:Baroid Hole Plug, 3/8'' chips, 127.5'-116.0', (3-50lbs bags)	608.7 (101.0) 606.0 (103.7) 595.7 (114.0) 593.7 (116.0)	
M 7107				

	Log updated with revised survey certified 3/23/2021		
	Top of PVC Casing Elevation (feet, NAVD88): 702.09)	WELL: GWC-8Z
SOUTHERN A			841443
COMPANY		2 Ponla	coment Wells
SOUTHERN COMPANY SERVICES, EARTH SCIENCE AND ENVIRONM	INC. FROME INC. INC. INC. INC. INC. INC. INC. INC.		
	LETED <u>4/28/2015</u> SURF. ELEV. <u>698.68</u> COORDIN	ATES:	N:1502827.67 E:2073526.15
CONTRACTOR Cascade Drilling	EQUIPMENT 7868 METHOD Sonic; SPT		PEADING
BORING DEPTH 73.31 ft. GROUN	D WATER DEPTH: DURING 53 ft. COMP. 50.5 ft.		ED 44.12 ft. after 100 hrs.
NOTES TOC Elevation 702.09, Sonic Di	rilling - 7"OD Casing in Overburden, 6"OD Core	-	
BOREHOLE	WELL DATA		COMMENTS
DATA			
protective a	luminum cover with bollards; 4-foot square concrete pad		
ELEV. Strata		ELE (DEPTI	/. 1)
Surface	Seal: Concrete		
		696. (2.5	2
690.7			
685.7			
Well: 2'	OD PVC (SCH 40)		
50lbs ba	Fill: Portiand Cement-Bentonite Grout (8 - 471bs bags PC, 0.5 - ags Gel, 45 gal. Water)		
<u>670.7</u>			
			•

SOUTHERN C EARTH SCIEN DREHOLE DATA	OMPANY SERVICES, INC. PROJECT Plant Bowen Cells 1 & 2 CE AND ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA WELL DATA	Replacement V	Vells
DREHOLE (1) DATA HIda	WELL DATA		
	Surface: protective aluminum cover with bollards; 4-foot square concrete pad		COMMENTS
_EV. Strata		ELEV. (DEPTH)	
42 	Annular Fill: Portland Cement-Bentonite Grout (8 - 47lbs bags PC, 0.5 - 50lbs bags Gel, 45 gal. Water)	653.7 (45.0)	
	Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (61.0'-48.0')) and Baroid Hole Plug 3/8 Chips (2 - 50lbs bags (48.0'-45.0'))		
35.7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	 ← Filter: Filter Media 1A Silica Sand (6 - 50 lbs bags) 	637.7 (61.0) 635.7 (63.0)	
	Screen: 10 ft. 0.010" Slot Prepack		
25.7	Sump:0.30 ft.	625.7	

EPLAC		Log updated with revised survey certifi	ed 3/	23/2021	
1 & 2 RE	1.06	Top of PVC Casing Elevation (feet, NAV	D88)	: 702.09	BORING GWC-8Z PAGE 1 OF 2
S	OUT	LOG OF TEST BOR	ING	j	<u>841443</u>
SO SO	UTHE	RN COMPANY SERVICES. INC. PROJECT Plant	Bower	n Cells 1 & 2 Repl	acement Wells
EA	RTH S	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION _Cart	ersville	e, GA	
	E STAR	TED 4/17/2015 COMPLETED 4/28/2015 SURF. ELEV. 698.68	C	COORDINATES:	N:1502827.67 E:2073526.15
	TRACT	OR Cascade Drilling EQUIPMENT 7868 METHOD	Soni	c; SPT	
	LED B	J. Sigler LOGGED BY B. Smelser CHECKED BY		ANGLI	E BEARING
⊟ BOR NOT	ING DE	PTH _73.31 ft. GROUND WATER DEPTH: DURING _53 ft. COM	P. <u>50</u> .	. <u>5 ft.</u> DELA	YED 44.12 ft. after 100 hrs.
S I NOT		C Lievalion 702.03, Sonic Drining - 7 OD Casing in Overburden, 0 OD Core			
115/CE		7	ION		
	G ^{HIC}		HCL		
	SRAF LO	MATERIAL DESCRIPTION S	te RE		COMMENTS
ENCC		Ξ	Veak Aodera strong		
MOG		Elastic Silt (MH)	> 2 0)		
021				SPT N=34bpf(@)3ft.)
5		residuum dry, hard, clayey, trace medium sized subangular to		9/14/20	
		subrounded rock fragments			
CH		Silt (ML) - trace mottling strong brown (7.5YR 5/8) and light vellowish brown		SPT N=25bpf(@	28ft.)
10		(10YR 6/4) residuum dry, very stiff, trace clay and medium to coarse, angular to subangular rock fragments		4/10/15	
MO					N12# \
		- mottled red (2.5YR 5/8), reddish yellow (7.5YR 6/8) and light gray		11/12/19	(15IL.)
		brittle, angular to subangular rock fragments			
NEKA					
มี เย				SPT N=19bpf(@)18ft.)
20		- motified light red (2.51 R 6/8), readish yellow (7.51 R 6/8) and light gray (10YR 7/1) residuum moist, very stiff, non to low plastic, clayey with		5/9/10	
		fragments			
		Silty Clay (CL-ML) - mottled reddish vellow (7.5YR 6/6), light grav (7.5YR 7/1) and red		SPT N=17bpf(@ 4/6/11)23ft.)
25 1		(10R 4/8) residuum moist, very stiff, low plastic, interbedded layers of CL, medium to coarse hard to brittle angular to subangular dolomite			
		fragments, trace very coarse angular chert fragments			
				SPT N=28hnf(@	128ft)
ABASt 30		- mottled red (2.5YR 5/8), light red (2.5YR 6/6) and light reddish gray (2.5YR 7/1), residuum moist yony stiff low to modium plastic trace		9/14/14	<i>/////////////////////////////////////</i>
IPAL		coarse to very coarse, rounded to subrounded white chert fragments			
- ESE					
LOG		Elastic Silt (MH)		SPT N=35bpf(@)33ft.)
35		- mottled reddish yellow (7.5YR 6/8), red (2.5YR 5/8) and light reddish gray (2.5YR 7/1) residuum moist, hard, non to low plastic, clayey,		15/16/19	
Щ		coarse to very coarse, angular to rounded chert fragments			
-					



LOG OF TEST BORING

sc	DUT	LOG OF TEST BOR	RING	BORING GWC-8Z PAGE 2 OF 2 841443
SOU EAR	JTHE TH S	RN COMPANY SERVICES, INC. PROJECT <u>Plan</u> CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Ca</u>	t Bowe	en Cells 1 & 2 Replacement Wells
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate Strong	COMMENTS
40		Elastic Silt (MH) (Con't) - mottled yellow / pale yellowish orange (10YR 8/6) and reddish yellow (7.5YR 6/6) residuum moist, very stiff, non to low plastic, coarse to very coarse, subangular to subrounded chert fragments		SPT N=16bpf(@38ft.) 6/7/9
45		✓ Silt (ML) - yellow (10YR 7/8) residuum moist, very stiff, trace subrounded to subangular, coarse to very coarse dolomite and chert fragments		SPT N=17bpf(@43ft.) 4/7/10
50		Elastic Silt (MH) - reddish yellow (7.5YR 6/8) and light red (2.5YR 6/6) residuum moist, stiff, non to low plastic, medium to cobble sized, angular to subangular chert and dolomite fragments		SPT N=12bpf(@48ft.) 4/5/7
55				SPT N=11bpf(@53ft.) 4/6/5
60		Sandy Silt (ML) - reddish yellow (7.5YR 6/8) residuum wet, very soft, cannot roll, cohesive, trace clay		SPT N=0bpf(@58ft.) WOH
65		Elastic Silt (MH) - strong brown (7.5YR 5/8) residuum wet, very stiff, low plastic, clayey with interbedded CL, cohesive, trace coarse to very coarse, subangular to subrounded chert and dolomite fragments		SPT N=21bpf(@63ft.) 5/10/11
70		- strong brown (7.5YR 5/8) residuum wet, very soft, low plastic, clayey, cohesive, trace medium to coarse rock fragments		SPT N=0bpf(@68ft.) WOH
		Bottom of borehole at 73.3 feet.		
75				
80				



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	DR		IG L	OG			Hole No	G	NC-8RF	२
Energy	to Serve Yos	ur World GEOLO	OGICA	L SE	RVICES			She	et 1 of	4	
		Plant Bowen Dry Gypsum Storage	Facili	ty		HOLE DEPTH	107	8	SURF.ELEV.	698	8.96
LOCAT		Cells 1 & 2		COORE	DINATES N	150285	7.71	E	2073	3501.74	
ANGLE		0 BEARING 0		CONTR	ACTOR	SCS	DF		CN	1E 75	
DRILLII	NG METHO	D Rotosonic NO. S	AMPLES		Continuou	IS NO. U	.D. SAMPLE	ES	C)	
CASIN	G SIZE	8" LENGTH		CO	RE SIZE		TOTAL %	6 REC.			
WATER	R TABLE DE	EPTH 46.02 ELEV 655.9	TIM	E AFTEI	R COMP.	24 hour	DATE	TAKEN			
TYPE (GROUT	QUANTITY		M	IX	DRI	LING STAF		6/27	7/2011	
DRILLE	R	Boart RECORDER C. Sellers	APPRO\	/ED		DRI	LING COM	P. DATE	6/27	7/2011	
Depth	Elev.	Material Description, Classification and Remarks		Sample No.	Star From To	idard Penetration Test Blows	N	Comme	ents	% Rec	RQD
0	701 92										
	101.02										
1		-									
2		CLAX Conduct brownigh rade find grained cand									
3		CLAY, Sandy, brownish red, line grained sand									
4											
5	696.92										
6		-									
7											
8											
0											
9											
10	691.92	-									
11											
12		CLAY, Silty; yellowish red; traces of chert gravel									
12		1									
13		-									
14		-									
15	686.92	1									
16											
47		1									
17		1									
18		+									
19		ļ									
20	681.92										
01		1									
1		†									
22		+									
23		4									
24	677 92										

sou	THERN	DRILLI							र
Energy	to Serve You	r World GEOLOGICA	L SE	RVICES			Sheet 2 of	4	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	107	SURF.ELEV.	701	.92
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	676.92								
26		CLAY, Silty; yellowish red; traces chert gravel							
27									
28									
29									
30	671.92								
31									
32									
33									
34		CLAY, Sandy; yellow, with chert							
35	666.92								
36									
37									
38									
39									
40	661.92	SAA							
41									
42									
43									
44									
45	656.92								
46									
47									
48		SAA							
49									
50	651.92								
51									
52									
53									
54 55	646.00								
56	645.92								

sou	THERN	DRILLI	NG L	.OG			Hole No. GWC-8RR			
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES		107	Sheet 3 of	4		
SITE -	1	Plant Bowen Dry Gypsum Storage Facility	Sampla	Stop	TOTAL DEPTH	107	SURF.ELEV.	701	.92	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD	
57	644.92									
58										
59										
60	641.92	Silt; yellow; wet								
61										
62										
63										
64										
65	636.92	SILT; yellow; sandy with chert gravel								
66										
67										
68										
69		SAA with increasing gravel content								
70	631.92									
71										
72										
73										
74										
75	626.92									
76										
77										
78										
79										
80	621.92									
81										
82										
83										
84		Top of rock at 84'								
85	616.92	Dolostone; blue grey; iron stained fractures								
86										
87										
88	613.92									

sou	SOUTHERN AND DRILLING LOG							Hole No. GWC-8RR			
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 4 of	4			
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	107	SURF.ELEV.	701	.92		
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD		
89											
90	611.92										
91		SAA									
92											
93											
94											
95	606.92										
96											
97											
98											
99											
100	601.92										
101											
102											
103											
104											
105	596.92										
106											
107	594.92										
108		BOH @ 107'									
109											
110	591.92										
111											
112											
113											
114											
115	586.92										
116											
117			1								
118			1								
119			1								
120	581.92		1	I					1		

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

GEOLOGICAL SERVICES Sheet 1 Sheet 1 Sheet 1 Site Plant Bowen Dry Gypsum Storage Facility HOLE DEPTH 70' SURF.EL LOCATION Cells 1 & 2 COORDINATES N 1503018.96 E 2 ANGLE BEARING CONTRACTOR SCS DRILL NO. OULD. SAMPLES DRILLING METHOD HSA NO. SAMPLES 14 NO. U.D. SAMPLES OULD. SAMPLES CASING SIZE LENGTH CORE SIZE TOTAL % REC. DATE TAKEN DATE TAKEN OUANTITY MIX DRILLING START DATE OUANTITY	of 3 ev. <u>691.99</u> 073781.05 CME-550 0
SITE Plant Bowen Dry Gypsum Storage Facility HOLE DEPTH 70' SURF.EL LOCATION Cells 1 & 2 COORDINATES N 1503018.96 E 2 ANGLE BEARING CONTRACTOR SCS DRILL NO.	EV. <u>691.99</u> 073781.05 CME-550 0
LOCATION Cells 1 & 2 COORDINATES N 1503018.96 E 2 ANGLE BEARING CONTRACTOR SCS DRILL NO. DRILLING METHOD HSA NO. SAMPLES 14 NO. U.D. SAMPLES CASING SIZE LENGTH CORE SIZE TOTAL % REC. WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN TYPE GROUT OUANTITY MIX DRILLING START DATE	073781.05 CME-550 0
ANGLE BEARING CONTRACTOR SCS DRILL NO. DRILLING METHOD HSA NO. SAMPLES 14 NO. U.D. SAMPLES CASING SIZE LENGTH CORE SIZE TOTAL % REC. WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN TYPE GROUT OUANTITY MIX DRILLING START DATE	CME-550 0
DRILLING METHOD HSA NO. SAMPLES 14 NO. U.D. SAMPLES CASING SIZE LENGTH CORE SIZE TOTAL % REC. WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN TYPE GROUT OUANTITY MIX DRILLING START DATE	0
CASING SIZE LENGTH CORE SIZE TOTAL % REC. WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN TYPE GROUT OUANTITY MIX DRILLING START DATE	
WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN TYPE GROUT OUANTITY MIX DRILLING START DATE	
TYPE GROUT OUANTITY MIX DRILLING START DATE	
	3/16/2006
DRILLER B. Filipovich RECORDER A. Grissom APPROVED DRILLING COMP. DATE	3/16/2006
Depth Elev. Material Description, Classification and Remarks Sample Standard Penetration Test	% Rec RQD
0 691.99	
1	
2	
3	
A Hard dark reddish brown sandy CLAY dry with S-1 35-5 10-14-18 32	
large chert fragments	
9 Same as above S-2 8.5-10 2-5-9 14	
10 681.99	
12	
13	
14 Same as above S-3 13.5-15 5-10-13 23	
15 676.99	
16	
17	
18	
19 Stiff, yellowish orange silty CLAY, fairly dry, S-4 18.5-20 4-4-5 9	
20 671.99 with few small rock fragments	
21	
21	
21 22 23	

DRI			NG L	.OG		Hole No. GWC-9			
Energy to Serve Your World GEOLOG				RVICES		Sheet 2 of 3			
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	70'	SURF.ELEV.	691	.99
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	666.99	Same as above, with many large chert fragments	S-5	23.5-25	4-7-6	13			
26									
27									
28									
29		Same as above, with small amount of chert	S-6	28.5-30	2-3-4	7			
30	661.99								
31									
32									
33									
34		Same as above. with small amount of chert	S-7	33.5-35	4-3-5	8			
35	656 99								
36	000.00								
37									
39									
30		Soft vellowish orange to light brown slightly sandy	5-8	38 5-40	W/∩H-2-2	1			
40	651.00	silty CLAY, moist, with trace of chert	00	00.0 +0	W011-2-2				
40	031.99								
42									
42									
43		Same as above	S-0	13 5-15	WOH_1_1	2			
44	646.00		0-0	+0.0-+0	WON-1-1	2			
40	040.99								
40									
47									
40		Firm light brown sandy CLAY, fairly dry, with	S-10	48 5-50	1-2-3	5			
50	641 99	a few chert fragments			120	Ŭ			
51									
52									
53									
54		Soft, yellowish orange slightly sandy CLAY, slightly	S-11	53.5-55	1-2-2	4			
55	636.99	moist, with trace of chert							
55									

SOUTHERN DRILLI				.OG		Hole No.	GWC-9			
Energy	to Serve You	r Warld GEOLOGICA	AL SE	RVICES			Sheet 3 of	3		
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	70'	SURF.ELEV.	691	.99	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD	
57										
58										
59		Very soft, yellowish orange sandy CLAY, with trace of pebbles	S-12	58.5-60	WOR	0				
60	631.99									
61										
62										
63										
64		Same as above, with many rock fragments	S-13	63.5-65	1-1-1	2				
65	626.99									
67										
68										
69		Same as above	S-14	68.5-70	50/2	R				
70	621.99	Top of rock								
71		Bottom of boring								
72										
73										
74										
75										
76										
77										
78										
79										
80										
82										
83										
84										
85										
86										
87										
88										

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



sou	THERN	4	DRILLI	NG L	OG			Hole No.	GWC-10		
Energy	COMP to Serve Yos	rWorld"	GEOLOGICA	L SE	RVICES			Sheet 1 o	Sheet 1 of 3		
SITE		Plant Bowen Dry Gyps	um Storage Facil	ity		HOLE DEPTH	65	SURF.EI	.ev. <u>684</u>	.89	
LOCAT		Cells 1 & 2		COORE	DINATES N	150316	2.7	E2	074019.96		
ANGLE		0 BEARING	0	CONTR	ACTOR	SCS	D	RILL NO.			
DRILLI	NG METHO	HSA	NO. SAMPLES		13	NO. U.D. SAMPLE		.ES	0		
CASING	G SIZE	4.25" ID LENGTH		CO	RE SIZE			% REC.			
WATEF	R TABLE DE	PTH ELEV	TIM	E AFTE			E TAKEN	EN			
TYPE O	GROUT	QUANTIT	Υ	M	IX	DRIL	RT DATE	E 8/24/2006			
DRILLE	R	B. Filipovich RECORDER M. H	Hughes APPROV	/ED		DRIL	IP. DATE	8/24/2006			
Depth	Elev.	Material Description, Classification	and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD	
0	694.90										
0	684.89										
1											
2											
3											
4		Red CLAY, with medium to large qua	artz pebbles	5-1	4-5.5	5-11-18	29				
5	679.89										
6											
7											
<u> </u>											
8											
9		Same as above		S-2	9-10.5	6-10-11	21				
10	674.89										
11											
- 11											
12											
13											
14		Same as above		S-3	14-15.5	5-11-13	24				
45	660.90										
15	009.09										
16											
17											
18											
19											
20	664.89	Same as above		S-4	19-20.5	5-15-11	26				
21											
22											
23											
24											

sou	THERN	DRILLI	NG L	OG			Hole No. G	lole No. GWC-10			
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES		C.F.	Sheet 2 of 3				
SITE -	1	Plant Bowen Dry Gypsum Storage Facility	Comple	Stop	TOTAL DEPTH	60	SURF.ELEV.	684	.89		
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD		
25	659.89	Orange and light tan CLAY with chert and rock fragments	S-5	24-25.5	5-6-6	12					
26											
27											
28											
29											
30	654.89	Same as above	S-6	29-30.5	7-5-5	10					
31											
32											
33											
34											
35	649.89	Same as above	S-7	34-35.5	11-8-5	13					
36											
37	ļ										
38											
39											
40	644.89	Same as above	S-8	39-40.5	4-4-4	8					
41											
42											
43											
44											
45	639.89	Same as above	S-9	44-45.5	3-4-7	11					
46											
47											
48											
49	ļ										
50	634.89	Brown CLAY with large and small rock fragments	S-10	49-50.5	3-4-6	10					
51											
52											
53			1								
54											
55	629.89	Orange and reddish brown CLAY with rock fragments and trace sand	S-11	54-55.5	WOH-2-0	2					
56											

sou	THERN	DRILLI	NG L	.OG	Hole No. GWC-10				
Energy	to Serve You	r World GEOLOGICA	L SE	RVICES		Sheet 3 of 3			
SITE -	1	Plant Bowen Dry Gypsum Storage Facility		0.	TOTAL DEPTH	65	SURF.ELEV.	684	.89
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	624.89	Brown and orange CLAY with rock fragments, trace sand	S-12	59-60.5	1-2-11	13			
61									
62									
63									
64									
65	619 89	No recovery	S-13	64-35.5	WOH	0			
66	010.00	Bottom of boring	0.10	0100.0		Ŭ			
67									
69									
60									
09									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82 92									
03 84									
85									
86									
87	1								
88									

Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.


sou	THERN	2	DRILLI	NG L	OG			Hole No.	GWC-10F	२
Energy	COMP to Serve You	ANY www.world	GEOLOGICA		RVICES			Sheet 1 o	f 4	
SITE _		Plant Bowen Dry Gypsur	n Storage Facil	ity		HOLE DEPTH	97.8	SURF.EL	_EV685	5.33
LOCAT		Cells 1 & 2		COORE	DINATES N	150315	4.01	E2	2074020.44	
ANGLE		0 BEARING	0	CONTR	ACTOR	SCS	D	RILL NO.	CME 75	
DRILLII	NG METHO	B HSA/HQ Core with water	NO. SAMPLES		14	NO. U	.D. SAMPL	ES	0	
CASIN	G SIZE	LENGTH		CO	RE SIZE		TOTAL	% REC.		
WATER	R TABLE DE	ртн <u>34</u> ' elev. <u></u>	651.33 _{TIM}	1E AFTEI	R COMP.	12h	DATI	E TAKEN	5/15/2007	
TYPE (GROUT	QUANTITY		M	IX	DRIL	LING STAI	RT DATE	5/14/2007	
DRILLE	R	S. Denty RECORDER L. M	illet APPRO	VED	Char	DRIL	LING CON	1P. DATE	5/14/2007	
Depth	Elev.	Material Description, Classification an	d Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	685.33									
1										
2										
3										
4										
	000.00		a al a anh an ata		450	0.0.40				
5	680.33	Dark red slity CLAY, dry, hard, occasio	nal cardonate	5-	4.5-6	6-8-12				
6										
7										
8										
0										
9										
10	675.33	Same as above with carbonate pebble	5	S-2	9.5-11	8-10-13	23			
11										
12										
10										
13										
14										
15	670.33	Dark orange silty CLAY, dry, hard, cark	oonate sand	S-3	14.5-16	10-13-42	55			
16		and coddles								
17										
17		•								
18										
19										
20	665.33	Same as above		S-4	19.5-21	9-7-8	15			
04										
21										
22										
23										
24										

sou	COMP						Hole No. G	WC-10F	२
Energy I SITE	ia Serve Yai	er World [®] GEOLOGI Plant Bowen Dry Gypsum Storage Facility	CAL SE	RVICES		97.8	Sheet 2 of 4	685	5.33
			Sample	Star	dard Penetration Test				
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	660.33	Orange silty CLAY, dry, firm, carbonate sand and pebbles	S-5	24.5-26	6-9-12	21			
26									
27									
28									
29									
30	655.33	Same as above	S-6	29.5-31	12-18-4	22			
31									
32									
33									
34									
35	650.33	Same as above	S-7	34.5-36	8-8-10	18			
36									
27		•							
- 57									
38									
39	0.45.00								
40	645.33	orange silty CLAY, dry, firm, occasional dark red mottling, occasional carbonate sand	5-8	39.5-40	2-3-5	8			
41									
42									
43									
44									
45	640.33	Orange silty CLAY, damp, firm, occasional black mottling, carbonate pebbles	S-9	44.5-46	5-5-8	13			
46									
47									
48									
49									
50	635.33	Orange and dark brown silty CLAY, damp, soft,	S-10	49.5-51	2-2-3	5			
51		occasional black molting, carbonate sand and pebbles							
52		4							
53		4							
54		4							
55	630.33	Same as above	S-11	54.5-56	4-5-6	11			
56	0004 7 05								

sou	THERN	Hole No. GWC-10R							
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES		07 (Sheet 3 of 4		
SITE _	1		Sample	Stan	dard Penetration Test	97.0	SURF.ELEV.	685	.33
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	625.33	Orange silty CLAY, moist, firm, light to heavy black	S-12	59.5-61	4-6-7	13			
61		mottling, carbonate sand and pebbles							
62									
02									
63									
64									
65	620.33	Orange and light gray CLAY, saturated, firm (gray) and soft (orange), occasional dark brown mottling,	S-13	64.5-66	10-20-12	32			
66									
67									
68									
69									
70	615.33	Light orange and medium brown silty CLAY,	S-14	69.5-71	2-10-6	16			
71		saturated, soft, carbonate pebbles and sand							
72									
72	612.22	73.1 Top of rock							
73	012.55								
75	610.33								
76									
77		Dark grav DOLOSTONE. shalev		77.6-82.6			5.0/4.7		
78									
79									
80	605.33	80.8- Fracture with iron staining							
81									
82									
83	602.33	Dark gray DOLOSTONE, shaley		82.6-87.6			5.0/5.0		
84									
85	600.33	85.2- Fracture with minimal clay rind							
86									
87									
88									

sou	THERN			OG			Hole No. G	WC-10F	R
Energy	to Serve You	r World GEOLOGICA	LSE	RVICES		07.9	Sheet 4 of 4		
SITE -	1	Fiant Bowen Dry Gypsum Storage Facility	Sampla	Stop		97.0	SURF.ELEV.	685	.33
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
89		88.6- Fracture over shale lense							
90	595.33	90.4-91.4 Open space with soil and clay rind							
91									
92				87.6-92.6			5.0/4.0		
93									
94									
95	590.33								
96	589.33	Shaley DOLOMITE/DOLOSTONE		92.6-97.6			5.0/5.0		
97									
98	587.33	Bottom of boring							
99									
100	585.33								
101									
102									
103									
104									
105	580.33								
106									
107									
108									
109									
110	575.33								
111	ļ								
112									
113									
114									
115	570.33								
116									
117									
118									
120	565.33								



sou	THERN	DRILL	ING L	.OG			Hole No.	G	WC-11	
Energy	COMP to Serve You	GEOLOGIC	AL SE	RVICES			Sheet	1 of	2	
SITE _		Plant Bowen Dry Gypsum Storage Fac	ility		HOLE DEPTH	46'	SU	RF.ELEV.	677	.83
LOCAT		Cells 1 & 2	COORI	DINATES N	150339	0.4	E	2073	829.95	
ANGLE		0 BEARING 0	CONTR	RACTOR	SCS	D	RILL NO.	CM	E-550	
DRILLI	NG METHO	D HSA NO. SAMPLE	s	9	NO. U.	D. SAMPL	.ES	C)	
CASING	G SIZE	LENGTH	CO	RE SIZE		TOTAL	% REC.			
WATER	R TABLE DE	PTH ELEV T	IME AFTE	R COMP.		DAT	E TAKEN			
TYPE 0	BROUT	QUANTITY	N	1IX	DRIL	LING STA	RT DATE	6/1	/2007	
DRILLE	R	S. Milam RECORDER J. Lippert APPR	OVED		DRIL	LING CON	IP. DATE	6/1	/2007	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comment	s	% Rec	RQD
0	677.83									
1										
2										
3										
-4	070.00		C 1	4560	5 9 0	17				
5	672.83	CLAY with chert fragments, slightly moist	3-1	4.5-6.0	9-9-6	17				
6										
7										
8										
9										
10	667.83	Same as above.	S-2	9.5-11.0	4-10-15	25				
11										
12										
13										
14										
15	662.83	Verv stiff, light reddish brown, sandv CLAY	S-3	14,5-16.0	7-12-12	24				
16	002.00	with chert gravel, slightly moist								
47										
17										
18										
19										
20	657.83	Stiff, light reddish brown, silty CLAY (CL) with chert gravel, moist	S-4	19.5-21.0	2-4-7	11				
21										
22										
23										
24										

sou	THERN	DRILLI	NG L	OG		Hole No. GWC-11			
Energy	to Serve You	GEOLOGICA	AL SE	RVICES			Sheet 2 of	2	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	46'	SURF.ELEV.	677	.83
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	652.83	Same as above, light brown	S-5	24.5-26.0	3-4-5	9			
26									
27									
28									
29									
30	647.83	Same as above, firm, very moist	S-6	29.5-31.0	2-4-3	7			
31									
32									
33									
34									
35	642.83	Firm, light brown and gray, plastic CLAY, some dolomite pebbles, very moist	S-7	34.5-36.0	2-2-3	5			
36									
37									
38									
39									
40	637.83	Very soft, light brown, sandy CLAY, wet	S-8	39.5-41.0	WOR	0			
41									
42									
43									
45	632 83	Same as above, very hard, with angular dolomite	S-9	44.5-46.0	50/1-x-x	R			
46		fragments							
47		Bottom of boring @ 46'							
48									
49									
50	627.83								
51									
52									
53									
54									
55	622.83								
56									



sou	THERN	DRILLIN	IG L	OG			Hole No.	GWC-11F	२
Energy	COMP to Serve Yos	ar World GEOLOGICA	L SE	RVICES			Sheet 1 c	of 3	
SITE _		Plant Bowen Dry Gypsum Storage Facili	ity		HOLE DEPTH	83.1	SURF.ELI	ev. <u>677</u>	7.73
LOCAT		Cells 1 & 2	COORI	DINATES N	150339	5.25	E20)73828.03	
ANGLE		0 BEARING 0	CONTR	ACTOR	SCS	D	RILL NO.	CME 75	
DRILLI	NG METHO	D HSA/HQ rock core with water NO. SAMPLES		8	NO. U.	D. SAMPL	.ES	0	
CASING	G SIZE	LENGTH	CO				% REC.		
WATEF	R TABLE DE	.PTH ELEV TIM	IE AFTE	R COMP.		DAT	E TAKEN		
TYPE G	GROUT	QUANTITY	N	IIX	DRIL	LING STA	RT DATE 5	5/30/2007	
DRILLE	R	S. Denty RECORDER J. Lippert APPROV	/ED		DRIL	LING COM	IP. DATE 5	5/31/2007	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	677.73								
1									
		1							
2									
3									
4		Very stiff light brown silty CLAY with chert	S-1	4.5-6	7-12-14	26			
5	672.73	fragments, slightly moist							
6									
0		•							
7		•							
8									
9									
10	667.73	Same as above, hard, light brown & red	S-2	9.5-11.0	8-12-26	36			
11									
		•							
12									
13									
14		Same as above, very stiff, light grey & brownish red, moist	S-3	14.5-16.0	8-12-15	27			
15	662.73	moist							
16									
47		1							
17		•							
18		•							
19		Same as above, light brown	S-4	19.5-21.0	8-8-8	16			
20	657.73	1							
21									
22									
		ł I							
23		4							
24									

sou	THERN	DRILLI	Hole No. GWC-11R						
Energy	o Serve You	r World [*] GEOLOGICA	AL SE	RVICES			Sheet 2 of	3	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	83	3.1 SURF.ELEV.	677	7.73
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	Ν	Comments	% Rec	RQD
25	652.73	Same as above, stiff, very moist	S-5	24.5-26.0	4-5-6	11			
26									
27									
28									
29		Same as above.	S-6	29.5-31.0	3-4-6	10			
30	647.73								
31									
32									
33									
34		Same as above.	S-7	34.5-36.0	2-3-6	9			
35	642.73								
36									
37									
38									
39	638.73	Dolomite gravel	S-8	39.5-41.0	36-50/1-X	R			
40	637.73	Start coring @ 40.1		10.1.10.1			0.0/0.0		
41	636.73	DOLOMITE, very hard, fresh, some Fe staining		40.1-48.1			8.0/2.2	28	28
42	635.73	41.6-47.1: Mud filled cavity							
43									
44									
45	632.73								
46									
47									
48		DOLOMITE, highly weathered joints							
49		48.1-51.4: Cavity		48.1-53.1			5.0/1.3	27	12
50	627.73								
51									
52		DOLOMITE, very hard, fresh, grey							
53				53.1-58.1			5.0/5.0	100	100
54									
55	622.73								
56 Form GS	9901 7-26-2	2004							

sou	THERN	DRILLI	NG L	.OG			Hole No. G	WC-11F	R
Energy	to Serve You	GEOLOGIC/	AL SE	RVICES			Sheet 3 of	3	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	83.	SURF.ELEV.	677	.73
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57		56.5: Chemically weathered joint							
58				59 1 62 1			5.0/4.0	00	00
59				50.1-05.1			5.0/4.0	98	90
60	617.73								
61									
62									
63				63.1-68.1			5.0/5.0	100	100
64								100	100
65	612.73								
66									
67									
68				68.1-73.1		Ę	5.0/2.1	42	33
69									
70	607.73	69.4-72.4: Cavity							
71									
72									
73		DOLOMITE 73.1-74.7: Cavity		73.1-78.1		Ę	5.0/1.1	22	7
74									
75	602.73	Very highly weathered top of rock							
76		75.8: Chemically weathered joint							
77									
78				78.1-83.1		Ę	5.0/4.8	95	92
79									
80	597.73	79.5: Slightly weathered joint							
82									
83									
84		83.1: Bottom of boring							
85	592.73								
86									
87									
88			1						



sou	THERN	2	DRILLIN	IG L	OG			Hole No.	GWC-12	
Energy	COMP to Serve You	r World	GEOLOGICA	L SE	RVICES			Sheet 1 of 2		
SITE _		Plant Bowen Dry Gypsum	Storage Facili	ty		HOLE DEPTH	51'	SURF.ELE	v. <u>674</u>	.66
LOCAT		Cells 1 & 2		COORE	NATES N	1503662	2.54	E20	73693.63	
ANGLE		0 BEARING	0 0	CONTR	ACTOR	SCS	DF	RILL NO. C	ME-550	
DRILLI	NG METHO	B HSA	NO. SAMPLES		10	NO. U.	.D. SAMPLE	ES	0	
CASING	G SIZE	LENGTH		CO	RE SIZE		TOTAL 9	% REC.		
WATEF	R TABLE DE	PTH ELEV	TIME	E AFTEI			DATE	TAKEN		
TYPE G	ROUT	QUANTITY		M	IX	DRIL	LING STAF	RT DATE 6	/4/2007	
DRILLE	R	S. Milam RECORDER J. Lipp	ert APPROVI	ED		DRIL	LING COM	IP. DATE6	/4/2007	
Depth	Elev.	Material Description, Classification and F	Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	674 66									
	07 1.00								1	
1										
2										
3										
4										
-	000.00			C 1	4560	266	10			
5	669.66	Stiff, gray and light brown, slity CLAY, m	IOIST	3-1	4.5-0.0	3-0-0	12			
6										
7										
8										
0										
9										
10	664.66	Same as above, firm		S-2	9.5-11.0	3-4-4	8			
11										
12										
13										
14										
15	659.66	Same as above, some sand		S-3	14.5-16.0	3-3-5	8			
16										
17										
40		1								
18										
19										
20	654.66	Same as above, some rounded chert pe	bbles	S-4	19.5-21.0	1-2-2	4			
21										
22		1								
23										
24										

sou	THERN	DRILLI	NG L	.OG		Hole No. GWC-12			
Energy	to Serve You	GEOLOGICA	AL SE	RVICES			Sheet 2 of	2	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	51'	SURF.ELEV.	674	.66
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	Blows	N	Comments	% Rec	RQD
25	649.66	Same as above	S-5	24.5-26.0	2-3-4	7			
26									
27									
28									
29									
30	644.66	Same as above, soft, very moist	S-6	29.5-31.0	1-2-2	4			
31									
32									
33									
34									
35	639.66	Same as above	S-7	34.5-36.0	1-1-2	3			
36									
37									
38									
39									
40	634.66	Same as above, firm, some dark brown mottling and	S-8	39.5-41.0	2-2-3	5			
41		angular chert fragments							
42									
43									
44									
45	629.66	Same as above, dark brown with abundant organics	S-9	44.5-46.0	2-2-4	6			
46	020100								
47									
48									
49									
50	624.66	Very hard, light brown and gray, sandy SILT with	S-10	49.5-51.0	2-50/2-X	R			
51		abundant chert fragments, wet							
52		51.0: Bottom of boring							
53									
54									
55	619.66								
56									



SOUTHERN DRIL				OG			Hole No.	GWC-13	3
Energy	COMP to Serve You	GEOLOGIC	AL SE	RVICES			Sheet 1 of 3		
SITE		Plant Bowen Dry Gypsum Storage Faci	lity		HOLE DEPTH	61'	SURF.EI	EV. 684	4.19
LOCAT		Cells 1 & 2	COORE	DINATES N	1503898	8.17	E	2073495.16	6
ANGLE		0 BEARING 0	CONTR	ACTOR	SCS	D	RILL NO.	CME-550	
DRILLIN	NG METHO	D HSA NO. SAMPLES	ŝ	12	NO. U.	.D. SAMPL	ES	0	
CASING	G SIZE	LENGTH	CO	RE SIZE		TOTAL	% REC.		
WATER	R TABLE DE	PTH ELEV TI	ME AFTE	R COMP.		DAT	E TAKEN	E/21/2007	
TYPE G	ROUT	QUANTITY	N	IIX	DRIL	LING STAI	RT DATE	5/31/2007	
DRILLE	R	S. Millam RECORDERJ. Lippert APPRC	Sample	Stan	DRIL	LING CON	IP. DATE	5/51/2007	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	684.19								
1									
2									
3									
4									
5	679.19		S-1	4.5-6.0	8-13-16	29			
6		very stiff, redaish brown, sandy slity CLAY, slightly moist							
6									
7									
8									
9									
10	674.19	Very stiff, reddish brown, sandy clavey SILT with rounded	S-2	9.5-11.0	8-11-13	24			
44		chert gravel, slightly moist							
- 11									
12									
13									
14									
15	669.19	Firm, light reddish brown, SILTY SAND, some clay,	S-3	14.5-16.0	4-9-9	18			
16		moist	1						
10									
17									
18									
19			1						
20	664.19	Chert gravel	S-4	19.5-21.0	8-13-16	29			
21		-							
21			1						
22									
23			1						
24									

sou	THERN	DRILLIN	IG L	.OG			Hole No. C	GWC-13	
Energy	to Serve You	r World GEOLOGICA	L SE	RVICES			Sheet 2 of	3	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	61'	SURF.ELEV.	684	.19
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	659.19	Very stiff, light grayish brown, sandy CLAY, moist	S-5	24.5-26.0	13-7-16	23			
26									
27									
28									
29									
30	654.19	Same as above, stiff, light reddish brown, some chert fragr	S-6	29.5-31.0	WOH-4-6	10			
31		very moist							
32									
33									
34									
35	649.19	Same as above	S-7	34.5-36.0	2-5-5	10			
36									
37									
38									
39									
40	644.19	Firm, light brown and light gray, sandy SILT, wet	S-8	39.5-41.0	3-4-4	8			
41									
42									
43									
44									
45	639.19	Same as above, stiff, some black sand interbeds	S-9	44.5-46.0	2-4-5	9			
46									
47									
48									
49									
50	634.19	Same as above, firm, some chert gravel	S-10	49.5-51.0	3-5-3	8			
51									
52									
53									
54									
55	629.19	Same as above	S-11	54.5-56.0	2-3-2	5			
56									

sou	THERN	2	DRILLING	LOG		Hole No. G	Hole No. GWC-13			
Energy	to Serve Yas	r World	GEOLOGICAL S	ERVICES			Sheet 3 of	3		
SITE		Plant Bowen Dry Gypsum Sto	orage Facility		TOTAL DEPTH	61'	SURF.ELEV.	684	.19	
Depth	Elev.	Material Description, Classification and Ren	narks No.	St From To	andard Penetration Test Blows	N	Comments	% Rec	RQD	
57										
58										
59										
60	624.19	Same as above. verv soft	S-12	59.5-61.0	WOR	0				
61										
62		61.0: Bottom of boring								
63										
64										
65	619,19									
66										
67										
68										
69										
70	614,19									
71										
72										
73										
74										
75	609.19									
76										
77										
78										
79										
80	604.19									
81										
82										
83										
84										
85	599.19									
86										
87										
88										



SOUTHERN COMPANY		1	DRILLING	LOG			Hole No.	GWC-13	R
Energy	COMP to Serve You	ar World GE	OLOGICAL SE	RVICES			Sheet 1 o	4	
SITE _		Plant Bowen Dry Gypsum Stora	age Facility		HOLE DEPTH	102.1'	SURF.ELE	v. <u>683</u>	3.93
LOCAT		Cells 1 & 2	COOF	DINATES N	150390	8.53	E20)73501.95	5
ANGLE		0 BEARING 0	CONT	RACTOR	SCS	DI	RILL NO.	CME-75	
DRILLI	NG METHO	D HSA/HQ rock core with water	NO. SAMPLES	16	NO. U	.D. SAMPLI	ES	0	
CASING	G SIZE	LENGTH	C(DRE SIZE		TOTAL 9	% REC.		
WATEF	R TABLE DE	PTH ELEV	TIME AFT	ER COMP.		DATE	E TAKEN		
TYPE G	BROUT	QUANTITY	I	MIX	DRII	LING STAF			
DRILLE	R	S. Denty RECORDER J. Lippert	APPROVED	stan	DRII	LING COM	IP. DATE		
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	683.93								
1								Τ	
-									
2									
3									
4									
5	678 93	Very stiff dark red sandy CLAY some rounde	d pebbles S-1	4.5-6.0	8-12-14	26			
	010.00	very moist	, , , , , , , , , , , , , , , , , , ,		0.2				
6									
7									
8									
9									
				0.5.44.0	0.40.40				
10	673.93	Same as above, brownish red and light brown, moist	slightly 5-2	9.5-11.0	9-12-16	28			
11									
12									
13									
14									
15	668.93	Very firm, light brown, SILTY SAND with chert fragments, moist	S-3	14.5-16.0	9-10-11	21			
16									
17									
10									
10									
19		4							
20	663.93	Same as above, dense, abundant chert fragme	ents S-4	19.5-21.0	10-20-19	39			
21									
22									
		1							
23		4							
24				1					1

sou	THERN	DRILLI	NG L	.OG			Hole No. G	WC-13F	۲
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES		102.1	Sheet 2 of	4	0.02
SITE -		· · ····· - · · · · · · · · · · · · · ·	Sample	Stan	dard Penetration Test		SURF.ELEV.	003	.93
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	658.93	Same as above, very stiff, light brown and brownish red, very moist	S-5	24.5-26.0	19-17-10	27			
26									
27									
28									
29									
30	653.93	Stiff, light brown and grayish white, silty CLAY with rounded chert pebbles, very moist	S-6	29.5-31.0	8-6-5	11			
31									
32									
33									
34									
35	648.93	Stiff, light brown, sandy clayey SILT, wet	S-7	34.5-36.0	3-5-4	9			
36									
37									
38									
39									
40	643.93	Same as above, some rock fragments	S-8	39.5-41.0	12-5-6	11			
41									
42									
43									
44									
45	638.93	Same as above, firm	S-9	44.5-46.0	2-3-2	5			
46									
47									
48									
49									
50	633.93	Same as above, light grayish brown	S-10	49.5-51.0	3-3-5	8			
51									
52			1						
53			1						
54	<u> </u>		1						
55	628.93	Same as above, very soft, light grayish brown and	S-11	54.5-56.0	1-0-1	1			
56		reaaisn brown							

sou	THERN	DRILL	ING L	OG			Hole No. G	WC-13F	र
Energy	to Serve You	r world GEOLOGIC	AL SE	RVICES		102	Sheet 3 of	4	02
SITE -	1		Sample	Stan	dard Penetration Test	102.	SURF.ELEV.	683	5.93
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	623.93	Same as above, soft	S-12	59.5-61.0	2-2-2	4			
61									
62									
63									
64	ļ								
65	618.93	Same as above	S-13	64.5-66.0	1-1-1	2			
66									
67									
68									
69									
70	613.93	No recovery	S-14	69.5-71.0	WOR	0			
71									
72									
73									
74									
75	608.93	No recovery	S-15	74.5-76.0	WOR	0			
76									
77									
78									
79									
80	603.93	No recoverv	S-16	79.5-81.0	WOR	0			
81					_				
82									
83		82.1: Top of rock DOLOMITE, very hard, fresh, gray, excellent rock		82.1-87.1		5	5.0/4.8	97	97
84		quality							
85	598.93								
86									
87				07.45			ost water		
88		87.0-87.8: Cavity		87.1-92.1		5	5.0/4.5	90	90

Untergy to Serve Your World OreOL OGICAL SERVICES Sine 1 4 of 4 SITE Plant Bowen Dry Gypsum Storage Facility TOTAL DEPTH 102.1' SURF.ELEV. 68 Depth Elev. Material Description, Classification and Remarks Sample Simulation Test No. From To Blows No. Comments %s Rec 89	2
Depth Elev. Material Description, Classification and Remarks Sample No. Standard Penetration Test From To Ocomments %, Rec 89	.93
Depth Elev. Material Description, Classification and Remarks No. From To Blows N Comments %; Rec 89	
89	RQD
90 593.93 91	
91	
92	
93 92.1-97.1 5.0/5.0 100 94 95 588.93 96 1 97 97 1 100 98 99 100 5.0/5.0 100 100 583.93 100 100	
94 4 95 588.93 96 4 97 4 98 5 98 5 99 6 100 583.93 101 101	100
95 588.93 96 97 97 97 98 97.1-102.1 99 97.1-102.1 100 583.93 101 101	
96 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97<	
97 97 98 99 100 583.93 101 100	
97 37 5.0/5.0 100 98 99 100 583.93 101 101	
98 99 100 583.93 101	100
99 100 583.93	
100 583.93 101	
101	
102 102 1: Bottom of boring	
103	
104	
105 578.93	
106	
107	
108	
109	
110 573 93	
115 568.93	

SO EA DATE CON DRIL BOR	UTHEI RTH S E STAF TRACT LED B ING DE ES <u>N</u>	RTED 10/31/2016 COMPLE FOR Cascade Y Tommy and Rodger LOGGED EPTH 102 ft bgs GROUND ear GWC-13R, *Sample Logged	LOG updated with revis Ground Surface Elevat Top of PVC Casing Ele LOG OF ENGINEERING TED <u>11/2/2016</u> SURF. EQUIPMENT PS T-1 BY D. Morris * C WATER DEPTH: DURING _ by geologist employed by A	rest survey certs ion (feet, NAVE vation (feet, NA rest bornd rest bornd re	ING Bowen ersville, VD88	(23/202 8 1.71): 684.6 (GA COORDIN	IATES: ANGLE DELAYE	BORING GWC-13 PAGE 1 0 6122160 N:1503926.70 E:2073517.44 BEARING	RZ DF 3 1/287
DEPTH (ft)	GRAPHIC LOG	MATERIAL	DESCRIPTION	ELEV	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	Comple Protecti 2-foot s	WELL DATA etion: ive casing set in concrete pad; quare concrete pad	ELEV (DEPTH
SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 1/6/17 11:1 - C:UUSERSIMACKENZIE FIOCAIDESKTOPPLANT BOWEN SOUTHERN COMPANY GPJ - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1		- same as above, (5 YR 5/6) - same as above, (5 YR 5/6) - CLAY (CH), brown (10 YR 6/	8), high plasticity, moist					Annular Fill: Aquaguard Grout Mixture	655.7 (26.0

(Continued Next Page)

ARTH SC	N COMPANY SERVICES, INC. PROJEC CIENCE AND ENVIRONMENTAL ENGINEERING LOCATIO	Γ <u>Plant</u> N <u>C</u> arte	Bowe ersville	e, GA	
(II) GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV	Veak HCL loderate REACTION	ROUNDWATER BSERVATIONS	WELL DATA Completion: Protective casing set in concrete pad; 2-foot square concrete pad
	(Cont.) - same as above, (10 YR 6/8), chert nodules - same as above, (10 YR 6/8), increasing chert and gravel, moist			<u>₹</u>	Annular Seal: 3/8" bentonite chips
	- same as above, hard drilling	601.7			

٦

ſ

s	OUT		LOG O	F TEST E	BORING	l		BORING GWC-13RZ PAGE 3 OF 3 <u>6122160287</u>
s	OUTHER	RN COMPANY SER	VICES. INC.	PROJECT	Plant Bowen	1		
E/	ARTH S	CIENCE AND ENVI	RONMENTAL ENGINEERING	LOCATION	Cartersville	, GA		
DEPTH (#)	GRAPHIC LOG		MATERIAL DESCRIPTION		ATT Meak Moderate Strong	GROUNDWATER OBSERVATIONS	Comple Protecti 2-foot s	WELL DATA tion: ve casing set in concrete pad; quare concrete pad ELEV. (DEPTH)
<u>90</u> 95 		(Cont.)						592.7 Filter: (89.0) silica filter sand 589.7 (92.0) 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
		- same as above			579 7			
105		I	Bottom of borehole at 102.0 feet.					
, , , , , , , , , , , , , , , , , , ,								
110	· · · ·							
115	· · · ·							
120	• • •							
125								
130								
135								



sou	THERN		DRILLIN	IG L	OG			Hole No.	GWC	-14	
Energy	COMP to Serve You	ur World	GEOLOGICA	L SE	RVICES			Sheet 1	of 3		_
SITE		Plant Bowen Dry Gypsum S	torage Facili	ty		HOLE DEPTH	80.5	SURF	ELEV.	684.04	4
LOCAT		Cells 1 & 2		COORD	INATES N	1504059	9.92	E	2073205	.96	
ANGLE		0 BEARING	0	CONTR	ACTOR	Ranger	D	RILL NO.	CME 55	50	
DRILLII	NG METHO	d HSA	NO. SAMPLES		16	NO. U.	D. SAMPLI	ES	0		
CASING	G SIZE	LENGTH		_ COF	RE SIZE		TOTAL	% REC.			
WATEF	R TABLE DE	ELEV	TIME	EAFTER	R COMP.		DATI	E TAKEN	8/22/20	07	
TYPE C	ROUT	QUANTITY		M	X	DRIL	LING STAF		8/22/20	07	
DRILLE	:к		S APPROV	ED Sample	Stand	DRIL		IP. DATE			
Depth	Elev.	Material Description, Classification and Rer	narks	No.	From To	Blows	N	Comments	% F	lec R	RQD
0	684.04										
1											
2]									
2		1									
3		-									
4		-									
5	679.04	Light brown sandy SILT, dry with some pe	bbles	S-1	4-5.5	4-4-9	13				
6											
7											
8		-									
9		-									
10	674.04	White, tan, light brown SILT, dry, with rock	flakes	S-2	9-10.5	5-9-14	23				
11		and pockets of sand									
12											
12		1									
13		1									
14		4									
15	669.04	Dark brown sandy SILT, dry, with dolomite	e fragments	S-3	14-15.5	6-14-19	33				
16		ļ									
17											
19]									
		1									
19		1									
20	664.04	White to light brown SILT, moist, with few fragments	quartz	S-4	19-20.5	2-4-7	11				
21		inaginento									
22											
22]									
23		1									
24	I										

sou	THERN COMP	DRILLI	NG L	.OG			Hole No. GWC-14			
Energy	to Serve You	r World [~] GEOLOGIC	AL SE	RVICES		80 5	Sheet 2 of 3	000	. 50	
SITE			Sample	Star	 Idard Penetration Test		SURF.ELEV.	683	5.56	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD	
25	658.56	White to light brown SILT, wet	S-5	24-25.5	2-2-3	5				
26	657.56	-								
27	656.56									
28	655.56									
29	654.56									
30	653.56	Light brown sandy SILT, moist, with rock fragments	S-6	29-30.5	4-3-5	8				
31	652.56									
32	651.56									
33	650.56									
34	649.56									
35	648.56	Light brown gravelly sandy SILT, wet, with quartz	S-7	34-35.5	2-6-8	14				
36	647.56	and dolomite fragments								
37	646.56									
38	645.56									
39	644.56									
40	643.56	Same as above	S-8	39-40.5	1-5-11	16				
41	642.56									
42	641.56									
43	640.56									
44	639.56									
45	638.56	Same as above	S-9	45.5	5-7	12				
46	637.56		_							
47	636.56									
48	635 56									
49	634.56									
50	633.56	Light brown SILT, wet, with rock fragments	S-10	49-50.5	4-5-9	14				
51	632.56		1							
52	631.56		1							
53	630.56		1							
54	629.56		1							
55	628.56	Same as above	S-11	54-55.5	6-7-11	18				
56	627.56									

sou	SOUTHERN DRILLING LOG							GWC-14	WC-14			
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 3 of 3					
SITE	1	Plant Bowen Dry Gypsum Storage Facility	Comple	Ster	TOTAL DEPTH	80.5	SURF.ELEV.	683	3.56			
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD			
57	626.56											
58	625.56											
59	624.56											
60	623.56	Light brown SILT, with some weathered rock	S-12	59-60.5	4-5-7	12						
61	622.56	Tragments										
62	621.56											
63	620.56											
64	619.56											
65	618.56	Same as above	S-13	64-65.5	4-2-2	4						
66	617.56											
67	616.56											
68	615.56											
69	614.56											
70	613.56	Light brown silty CLAY, wet, very soft	S-14	69-70.5	1-2-4	6						
71	612.56											
72	611.56											
73	610.56											
74	609.56											
75	608.56	Mottled light/dark brown/gray SILT, wet, with few	S-15	74-75.5	6-7-7	14						
76	607.56	rock tragments										
77	606.56											
78	605.56											
79	604.56											
80	603.56	Same as above	S-16	79-80.5	5-7-9	16						
81	602.56	80.5: Bottom of boring										
82	601.56											
83	600.56											
84	599.56											
85	598.56											
86	597.56											
87	596.56											
88	595.56											

				Log updated with rev Ground Surface Fleva	ised survey o ation (feet, NA	ertifie AVD88	d 3/2	3/2021 4.34				
12				Top of PVC Casing E	evation (feet,	NAVE): 0188):	687.28			BORING GWC-14 PAGE 1 O	4Z F 2
S	ou	THI	ERN A	LOG OF TEST BORING							61221602	287
SO EA	UTH RTH	ERN C SCIEN	OMPANY SERVICES, IN NCE AND ENVIRONMEN	NC. ITAL ENGINEERING	PROJECT LOCATION	Plant	Bower ersville	n e, GA				
						0.41.014		0000		- 0	N 4504000 77 5 0070400 00	
CON	TRAC	CTOR	Cascade COM	EQUIPMENT	<u>PS T-150</u> MI	ETHOD	<u>VD8</u> 8	COORI	JINAT	:5:	N: 1504060.77 E:2073193.66	
DRIL	LED	BY _T	ommy and Rodger LOGG	ED BY D. Morris *	CHECKED E	SY				.E	BEARING	
BOR	NG [DEPTH	GROU	ND WATER DEPTH: DURI	NG		9 . <u>57</u>	ft bgs	_ DEL/	YED	34 ft.;1 days	
	ES _	Near C	GWC-14, *Sample Logg	ed by geologist employed	by Amec Foster	Wheele	r					
DEPTH (ft)	GRAPHIC	LOG	MATER	IAL DESCRIPTION		ELEV.	Weak Moderate Strong REACTION	GROUNDWATER DBSERVATIONS	Com Prot 2-for	npletio ective ot squ	WELL DATA on: e casing set in concrete pad; uare concrete pad	ELEV DEPTH
		- S	ILT (ML), brown (7.5 YR	R 4/4), dry				00			Annular Fill: Aquaguard Grout Mixture	<u>DEF 111</u> ,
		- C pla	LAY (CL), red, brown ar sticity, dry	nd white (7.5 YR 5/3 - 8/1),	tight, low	677.3 674.3						
		- C stif	LAY (CL) with chert lens f, low plasticity, dry	ses, gray (7.5 YR 8/6), tigh	t, medium							
		- S	ILT (ML), light gray (7.5	YR 5/0), medium stiff, mo	ist	667.3						
20 - 0.005EKSIMAC		- S	ILT (ML), beige (7.5 YR	8/6), medium stiff, moist		663.3						
25	••• ••• •••											656.8
	· · ·										Annular Seal: 3/8" bentonite chips	(27.5)
	· · · · · · · · · · · · · · · · · · ·							Ţ				
	••• ••• ••	- S	ILT (ML), brown (7.5 YF	8 5/8), medium stiff, white r	nodules, moist	647.3						

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **684.34** Top of PVC Casing Elevation (feet, NAVD188): **687.28**



LOG OF TEST BORING

BORING GWC-14Z PAGE 2 OF 2 6122160287

SO	JTHEF	RN COMPANY SERVICES, INC. PROJEC	CT Plant	Bowe	n	
EAF	RTH SO	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATI	ON Carte	ersville	e, GA	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV	Veak Aoderate Strong REACTION	BSERVATIONS	WELL DATA Completion: Protective casing set in concrete pad; 2-foot square concrete pad
45 50 55 60 65 70 75		(Cont.) - CLAY (CL), brown (7.5 YR 5/8), moderate plasticity, moist - same as above, black and white layering, wet - same as above, wet - same as above, wet - Top of Rock @ 73.0 feet Bottom of borehole at 73.0 feet.	639.3 614.3 611.3		O 	CONTINUED Annular Seal: 3/8" bentonite chips Annular Seal: 3/8" bentonite chips Annular Seal: 3/8" bentonite pellets (non-coated) Filter: (61 silica filter sand Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
<u>80</u> 85						



sou	THERN	DRILLI	NG L	.OG			Hole No.	GWC-15	;	
Energy	COMP to Serve You	GEOLOGIC	AL SE	RVICES			Sheet 1 of 3			
SITE _		Plant Bowen Dry Gypsum Storage Faci	lity		HOLE DEPTH	70	SURF.ELI	ev. <u>692</u>	2.75	
LOCAT		Cells 1 & 2	COORI	DINATES N	150394	3.59	E20	72927.52		
ANGLE 0 BEARING 0			CONTR	RACTOR	SCS	DI	RILL NO. CME 550			
DRILLI	NG METHOD	D HSA NO. SAMPLES	š	13	NO. U	.D. SAMPLI	es 0			
CASING	G SIZE	LENGTH	co	RE SIZE		TOTAL 9	% REC.			
WATER	R TABLE DE	PTH ELEV TI	ME AFTE	R COMP.		DATE	E TAKEN	KEN		
TYPE G	ROUT	QUANTITY	Y MIX		DRII	LING STAF		DATE 5/30/2007		
DRILLE	R	S. Milam RECORDER J. LIPPERT APPRO	VED	Stand	DRII	LING COM	IP. DATE	TE		
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD	
0	692.75									
1										
-										
2										
3										
4										
5	687 75		S-1	4.5-6.0	4-3-3	6				
	001.10	Firm, reddish brown, silty sandy CLAY, moist				Ŭ				
6										
7										
8										
9										
40	000 75		6.0	0 5 11 0	2.40.0	10				
10	682.75	same as above, very still, reddish brown and light brown	5-2	9.5-11.0	3-10-0	10				
11										
12										
13										
14										
14										
15	677.75	Stiff, reddish brown and light yellowish gray banded, clayey SILT, moist	S-3	14.5-16.0	4-6-8	14				
16										
17										
18										
19										
20	672.75	Same as above, firm, predominantly yellowish gray	S-4	19.5-21.0	4-4-4	8				
21										
22										
23										
24	1		1						1	

sou	THERN	DRILLI	NG L	.OG	Hole No. GWC-15				
Energy	to Serve You	ar World GEOLOGIC	AL SE	RVICES	70	Sheet 2 of	3		
SITE -		Plant Bowen Dry Gypsum Storage Facility	0	Oter	TOTAL DEPTH	70	SURF.ELEV.	692	2.75
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	Blows	N	Comments	% Rec	RQD
25	667.75	Firm, reddish brown and yellowish brown, silty CLAY,	S-5	24.5-26.0	3-3-4	7			
26									
27									
28									
29									
30	662.75	Firm, yellowish brown, clayey SILT, very moist	S-6	29.5-31.0	2-3-5	8			
31									
32									
33									
34									
35	657.75	Same as above, soft	S-7	34.5-36.0	2-2-2	4			
36									
37									
38									
39									
40	652.75	Same as above, very stiff, with chert gravel, wet	S-8	39.5-41.0	4-8-8	16			
41									
42									
43									
44									
45	647.75	Same as above, verv hard	S-9	44.5-46.0	4-5-50/2	>100			
46									
47									
48									
49									
50	642.75	No recovery	S-10	49.5-51.0	3-3-2	5			
51									
52									
53									
54		1	1						
55	637.75	Firm, brown, sandy SILT, wet	S-11	54.5-56.0	8-5-3	8			
56									

SOUTHERN AN COMPANY Energy to Serve Your World		DRILLING L	.OG	Hole No. GWC-15					
		GEOLOGICAL SE	RVICES		Sheet 3 of	3			
SITE _		Plant Bowen Dry Gypsum Sto	orage Facility		TOTAL DEPTH	70	SURF.ELEV.	692	.75
Depth	Elev.	Material Description, Classification and Rer	narks No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57									
58									
59									
60	632.75	Same as above, light brown and brown	S-12	59.5-61.0	1-3-2	5			
61									
62									
63									
64									
65	627.75	Same as above	S-13	64.5-66.0	0-0-2	2			
66									
67									
68									
69									
70	622.75								
71		70.0: Bottom of boring							
72									
73									
74									
75	617.75								
76									
77									
78									
79									
80	612.75								
81									
82									
83									
84									
85	607.75								
86									
87									
88									
Log Updated with revised survey certified March 23, 2021. Elevations are in feet NAVD88.



Log Updated with revised survey certified March 23, 2021. Coordinates are NAD83. Elevations are in feet NAVD88.

sou	THERN	A	DRILLIN	IG L	OG			Hole No.	GWC-15F	R
Energy	COMP to Serve Yor	ANY ir World [*]	GEOLOGICA	L SEI	RVICES			Sheet 1	of 4	
SITE		Plant Bowen Dry Gypsum S	torage Facili	ty		HOLE DEPTH	95.5	SURF.E	ELEV. 693	.39
LOCAT		Cells 1 & 2		COORE	DINATES N	150393	6.17	E	2072919.39	
ANGLE		0 BEARING	0	CONTR	ACTOR	SCS	D	RILL NO.	CME 75	
DRILLI	NG METHO	HSA/HQ rock core with water	NO. SAMPLES		14	NO. U	.D. SAMPL	ES		
CASING	G SIZE	LENGTH		co	RE SIZE		TOTAL	% REC.		
WATER	R TABLE DE	PTH ELEV	TIM	E AFTE	R COMP.		DATE	E TAKEN		
TYPE G	ROUT	QUANTITY		N	IIX	DRII	LLING STAF		5/23/2007	
DRILLE	R	S. Denty RECORDER K. Hobbs	APPRO	'ED		DRII	LLING COM	IP. DATE	5/24/2007	
Depth	Elev.	Material Description, Classification and Rem	narks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	693.39									
1										
3		Light brown sandy SILT, slightly moist quar	tz sands	S-1	3.5-5	2-3-4	7		40	
4										
5	688.39									
6										
7										
•		Sama as above w/ mottling		6.2	95110	4714	21		100	
0		Same as above w/ mouning		5-2	0.5-11.0	4-7-14	21		100	
9										
10	683.39									
11		•								
12										
13										
14		Mottled light brown clavey SILT w/ lavers of	f light tan silty	S-3	14.5-16.0	3-6-8	14		100	
15	679.20	clay, slightly moist. Few sand grains.							100	
10	070.39									
16										
17										
18										
19		Mottled light brown clayey SILT w/ tan & red	d brown	S-4	19.5-21.0	3-5-7	12			
20	673.39									
21										
22										
23										
24										

sou	THERN	Hole No. GWC-15R							
Energy	to Serve You	Plant Bowen Dry Gypsum Storage Facility	AL SE	RVICES		95.5	5 Sheet 2 of	4 603	30
	1		Sample	Stan	dard Penetration Test		SURF.ELEV.	033	.55
Depth	Elev.	Material Description, Classification and Remarks	No.	From To 24 5-26 0	Blows 2-3-6	N Q	Comments	% Rec	RQD
25	668.39	SILT, slightly moist. Some small 1cm weathered		24.0 20.0	200			100	
26									
27		-							
28		-							
29		SAA	S-6	29.5-31.0	15-5-5	10		100	
30	663.39	-							
31		-							
32		-							
33			0.7	045000	4.0.4				
34		Approxiate 50% rock fragments, up to 2 mm diameter.	5-7	34.5-36.0	1-2-4	6		100	
35	658.39	Very moist							
36		-							
37		-							
38									
39		Soft light brown SILT w/ some small pebbles, wet	S-8	39.5-41.0	2-1-3	4		100	
40	653.39	-							
41		-							
42									
43		Soft light brown SILT very homogenous wet	S-9	44 5-46	1-1-2	3		100	
45	648.39					Ŭ		100	
46									
47		1							
48									
49		Soft, wet light brown SILT w/ small pebbles,	S-10	49.5-51	1-2-2	4		100	
50	643.39	saurateu							
51									
52		4							
53		-							
54		Very soft, saturated, light brown SILT, few pebbles	S-11	54.5-56	WOR	0			
55	638.39	-							
56 Form GS	9901 7-26-	2004							<u> </u>

sou		DRILLI			Hole No. G	WC-15F	R		
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES		05	Sheet 3 of	4	
SITE -	ī.		Sample	Stan	. TOTAL DEPTH	35.	SURF.ELEV.	693	.39
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57									
58									
59		Very soft light brown SILT w/thin bands of tan/white	S-12	59.5-61	W.O.R	0		100	
60	633.39	Sanu, Saturateu							
61									
62									
63									
64		Very soft, saturated light brown SILT w/ some sand	S-13	64.5-66	1-1-1	2		100	
65	628.39	layers less than 2 cm thick, lew rock fragments							
66									
67									
68									
69									
70	623.39	Very stiff light brown SILT, saturated w/ a 2" layer of weathered dolomite. Some red & black banding in	S-14	69.5-71	6-12-5	17		100	
71		the slit.							
72		71.1: Top of rock, start coring							
73									
74		Chert rich DOLOMITE w/ stylolites		74.5-77.9			3.4/3.4	100	
75	618.39								
76									
77		Grey DOLOMITE w/thin shale interbeds		77.9-82.9		4	5.0/5.0	100	
78									
79									
80	613.39								
81				00.0.00 5			6.0/6.0	100	
82		Grey DOLOMITE w/ some calcite filled fractures		02.9-00.0			0.0/0.0	100	
83									
84									
85	608.39								
86									
87	 								
88									

DRILLING LOG								Hole No. GWC-15R			
Energy	to Serve You	Plant Bowen Dry Gypsum Storage Facility	AL SE	RVICES	TOTAL DEPTH	95	.5 SURF.ELEV.	4 693	.39		
			Sample	Stan	dard Penetration Test						
Depth	Elev.	Material Description, Classification and Remarks	NO.	Prom To	Blows	N		% Rec	RQD		
09	603 30			00.0-90.0			1.0/1.0	100			
90	003.39										
97											
93											
94											
95	598.39										
96		95.5: Bottom of boring									
97											
98											
99											
100	593.39										
101											
102											
103											
104											
105	588.39										
106											
107											
108											
109											
110	583.39										
111											
112											
113											
114	570.00										
115	518.39										
117											
<u>11</u> 8											
119											
120	573.39										

-		•	Log updated with rev Ground Surface Eleva Top of PVC Casing El	vised survey c ation (feet, NA levation (feet,	ertifie VD88 NAVE	d 3/23): 693)188):	3/2021 3 .28 695.92			BORING GWC-1	5Z
s	DU	THERN A	LOG	OF TEST E	BOR	ING			-	PAGE 1 (612216))F 2)287
SOI EAF	JTHE RTH S	SCIENCE AND ENVIRONME	INC. ENTAL ENGINEERING	PROJECT LOCATION	Plant	Bowen ersville	, GA				
DATE CONT	STA	RTED <u>10/28/2016</u> CO	MPLETED <u>10/31/2016</u> S EQUIPMENT	URF. ELEV. 693 PS T-150 ME	.28' NA'	<u>VD8</u> 8	C00	RDINA	TES:	N:1503952.26 E:2072918	.71
DRILL	ED E	BY Tommy and Rodger LOG	GED BY D. Morris*	CHECKED B	Y			ANG	LE	BEARING	
BORI	NG D	EPTH 72 ft bgs GRC	UND WATER DEPTH: DURI	NG	COMP	9. <u>45 f</u>	t bgs	DEL	AYED	42 ft.;4 days	
NOTE	S N	lear GWA-15, *Sample Log	ged by geologist employed I	by Amec Foster	Nheele	r					
DEPTH (ft)	GRAPHIC I OG	MATE	RIAL DESCRIPTION		ELEV.	Weak Moderate HCL Strong REACTION	GROUNDWATER DBSERVATIONS	Con Proi 2-fo	npletio tective ot squ	WELL DATA on: e casing set in concrete pad uare concrete pad	ELE (DEPT
		- SILT (ML), red orange (5 YR 5/8), dry						M	Annular Fill:	
<u>5</u> _10		- clayey SILT (ML), dark - SILT (ML), interbedded	red (5 YR 4/6), dry red, black and orange (5 YF	₹ 8/8), dry	688.3						
<u>15</u> 20 25		- same as above, (7.5 YF	२ 5/8), with chert lenses from	n 23-27', dry							
<u>30</u> <u>35</u>		- CLAY (CL) with chert no moderate plasticity, mois	odules, tan and white (10 YF t	₹ 7/6),	. 665.3					Annular Seal: 3/8" bentonite chips	660 (33
40					653 3						

⁽Continued Next Page)

S	OUT	HERN A LOG OF TEST	BOR	RING	6		BORING GWC-1 PAGE 2 C <u>6122160</u>	5Z DF 2 287
so	UTHER	COMPANY RN COMPANY SERVICES, INC. PROJECT	Plant	Bowe	n			
EA	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATIO	N Cart	ersville	e, GA			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION - sandy CLAY (CH), tan, white and black (10 YR 7/6), high plasticity	ELEV	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	Compl Protec 2-foot	WELL DATA letion: tive casing set in concrete pad; square concrete pad	ELEV (DEPTH
45		- clayey SAND (SC), tan, white and black (10 YR 7/6), moist - CLAY (CH), tan (10 YR 7/6), high plasticity, saturated	648.: 646.:	3	Ā		3/8" bentonite chips	
55		- same as above, saturated	633.3	3			Annular Seal: 3/8" bentonite pellets (non-coated)	639.3 (54.0 634.3 (59.0
65		- same as above, saturated	628.3	3			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack	631.3 (62.0
70		 - same as above, saturated - Top of rock @ 72.0 feet Bottom of borehole at 72.0 feet. 	621.3	3				
75								
80 85								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **728.74** Top of PVC Casing Elevation (feet, NAVD88): **731.21**

WELL CONSTRUCTION LOG Southern Company Generation							
PROJECT: Plant Bowen Dry Gypsum DRILLING CO.: SCS							
Storage Facility	DRILLER: D. Willis		NAME				
LOCATION: Cells 1&2	RIG TYPE: CME 550						
LOGGER: L. Millet	DRILLING METHODS: HSA/HQ Rock core with w	ater	GWA-50				
DATE CONSTRUCTED: 6/4/2008 - 8:00 am							
		DEPTH	ELEVATION				
		FEET	FT,NAVD88				
Locking Hinged Top	- Padlock						
		2 /7	731 21				
	2" Threaded Diser Con	2.47	751.21				
	2 Threaded Riser Cap						
	Pea Gravel in annular space						
4-ft x 4-ft x 4" concrete pad							
	GROUND SURFACE	0.00	728.74				
	SIZE: 4x4-inch						
	(,) I YPE: Anodized Aluminum						
	BOTTOM OF PROTECTIVE CASING						
Well Development: Pump/surge until							
clear	BACKEILI MATERIAI						
	TYPE: Portland Cement Grout						
	AMOUNT: 20 bags @ 1.3 cf/bag = 26 cf						
	PLACEMENT: Tremie						
All drill equipment steam-cleaned							
between borings	RISER CASING						
	DIA: 2-inch						
	TYPE: ASTM-NSF Schedule 40 PVC						
	JOINT TYPE: Flush Threaded						
	TOP OF SEAL	78.00	650.74				
	ANNULAR SEAL						
	TYPE: 3/8-inch coated bentonite pellets	5					
	5-gal buckets						
		01 50	647.24				
		01.50	047.24				
	TVPE: DSI Sand - 14 (20/30 grain size)						
	Drillers Services Inc						
	AMOUNT: 1.75 bags: 50 lbs/bag						
	PLACEMENT: Tremie: wash with water						
	PRE-PACK FILTER SAND: DSI - 1A						
	BOTTOM OF RISER / TOP OF SCREEN	84.03	644.71				
	SCREEN						
	DIA: 2-inch						
	TYPE: ASTM-NSF Sch 40 PVC Prepace	K I					
	OPENING WIDTH: 0.01-inch						
	OPENING TYPE: Slotted						
	SLUT SPACING: 0.25-inch						
	SLUT LENGTH: 1.5-INCN	04.00	624 74				
	BOTTOM OF SCREEN	94.03	034.71				
		94 22	634 / 1				
		37.00	004.41				
	l						
ΗΟΙ Ε ΟΙΔ.	10.5"						
L		l					

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **728.74** Top of PVC Casing Elevation (feet, NAVD88): **731.21**

sou	THERN	DRILLI	NG L	OG			Hole No.	GWA-50	
Energy	o Serve You	GEOLOGICA	L SE	RVICES			Sheet 1	of 4	
SITE _		Plant Bowen Dry Gypsum Storage Facil	ity		HOLE DEPTH	93.5	SURF.E	ELEV. 728	8.74
LOCAT		Cells 1 & 2	COORI	DINATES N	150215	4.80	E	2072442.13	
ANGLE		0 BEARING 0	CONTR	ACTOR	SCS	DI	RILL NO.	CME 550	
DRILLII	NG METHO	D HSA/HQ rock core with water NO. SAMPLES		15	NO. U.D. SAMPLE		.ES 0		
CASING	G SIZE	LENGTH	co	RE SIZE		TOTAL	% REC.		
WATER	R TABLE DE	EPTH62.5ELEV666.24 TIM	1E AFTE	R COMP.	15 hours	DATE	E TAKEN	6/4/2008	
TYPE 0	ROUT	QUANTITY	N	IIX	DRIL	LING STAF	RT DATE	5/28/2008	
DRILLE	R	D. Willis RECORDER L. Millet APPRO	VED		DRIL	LING COM	IP. DATE	6/2/2008	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	728.74								
1									
<u> </u>									
2									
3									
4									
5	723 74	Dark red CLAY dry stiff with light gray mottling	S-1	4.5-6	4-7-10	17			
	120.11								
6									
7									
8									
9									
- 10	740 74		<u> </u>	0 5 44	E 40 44	0.4			
10	/18./4	orange silt, occassional coarse sand grains	5-2	9.5-11	5-10-14	24			
11									
12									
13									
14									
14									
15	713.74	Dark red CLAY, dry, stiff, with orange and white bebbles	S-3	14.5-16	6-8-8	16			
16									
17									
18									
10									
19		4							
20	708.74	Orange and dark red silty CLAY, dry, stiff,	S-4	19.5-21	7-8-11	19			
21									
22									
		1							
23		4							
24	704.74								

sou	THERN	DRILLI	NG L	.OG			Hole No. C	GWA-50	
Energy	to Serve Yo	rr World" GEOLOGIC/	AL SE	RVICES		02	Sheet 2 of 4		
SITE -		Plant Bowen Dry Gypsum Storage Facility	0	0.1	TOTAL DEPTH	93.:	SURF.ELEV.	728	8.74
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	703.74	Light tan and white silty CLAY, dry, stiff, with	S-5	24.5-26	6-8-9	17			
26									
27									
28									
29									
30	698.74	Dark red and white silty CLAY, dry, crumbly,	S-6	29.5-31	6-12-13	25			
31		occassional tan mottling							
32									
33									
34									
35	693.74	Light tan and orange silty CLAY, moist, with	S-7	34.5-36	7-7-11	18			
36									
37									
38									
39									
40	688.74	Same as above	S-8	39.5-41	4-4-4	8			
41									
42									
43									
44									
45	683 74	Tan and light brown clavey SILT, moist, some white	S-9	44.5-46	5-10-10	20			
46		mottling, occassional coarse sand grains							
47									
48									
49									
50	678.74	Orange and brown clayey SILT, moist, firm,	S-10	49.5-51	3-4-5	9			
51		occassional dark brown mottling, degraded white cobbles							
52									
53									
54									
55	673.74	Orange SILT, moist, softer, degraded and intact	S-11	54.5-56	6-9-10	19			
56	672.74	gravel and cobbles							

sou	THERN		NG L	.OG			Hole No. O	GWA-50	
Energy	to Serve Yo	r World" GEOLOGICA Plant Bowen Dry Gynsum Storage Facility	L SE	RVICES		93	Sheet 3 of 4	700	74
SITE _	1		Sample	Stan	dard Penetration Test		SURF.ELEV.	728	6.74
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	671.74								
58									
59									
60	668.74	Same as above, with chert	S-12	59.5-61	3-4-5	9			
61									
62									
63									
64									
65	663.74	Same as above	S-13	64.5-66	5-8-12	20			
66									
67									
68									
69									
70	658.74	Orange clayey SILT, saturated, soft, with dark red,	S-14	69.5-71	9-12-12	24			
71		white, and dark brown mottling, carbonate and chert cobbles and gravel							
72									
73									
74									
75	653.74	Chert cobble in bottom of spoon	S-15	74.5-76	50/1	R			
76									
77									
78		Auger refusal - 78.2							
79									
80	648.74	Tan and orange chert and carbonate, with fractures,		78.5-88.5			1.7/10.0		
81		fractures filled with sand and clay, iron staining, rock is fossiliferous and pitted							
82									
83									
84									
85	643.74								
86									
87									
88	640.74								

sou	DRILLING LOG							Hole No. GWA-50			
Energy	o Serve Yor	ar World" GEOLOGICA	L SE	RVICES			Sheet 4 of 4				
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	93.5	SURF.ELEV.	728	.74		
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Test Blows	N	Comments	% Rec	RQD		
89	639.74	Same as above		88.5-93.5			0.8/5.0				
90	638.74										
91											
92											
93	633.74										
		93.5 Bottom of boring									
<u> </u>											
<u> </u>											
<u> </u>											
<u> </u>											
<u> </u>											
<u> </u>											
<u> </u>											
<u> </u>											
L											

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **727.87** Top of PVC Casing Elevation (feet, NAVD88): **730.37**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **727.87** Top of PVC Casing Elevation (feet, NAVD88): **730.37**

sou	THERN	DRILLIN	IG L	OG			Hole No.	GWA-50	R
Energy	o Serve You	r World GEOLOGICA	L SE	RVICES			Sheet	1 of 5	
SITE _		Plant Bowen Dry Gypsum Storage Facil	ity		HOLE DEPTH	142.9	SURF	ELEV. 727	7.87
LOCAT		Cells 1 & 2	COORE	DINATES N	150215	0.85	E	2072448.35	,
ANGLE		0 BEARING 0	CONTR	ACTOR	SCS	DF	RILL NO.	CME 550	
DRILLII	NG METHO	D HSA/HQ rock core with water NO. SAMPLES		18	NO. U.	.D. SAMPLE	ES	0	
CASING	G SIZE	7.5" OD LENGTH	CO	RE SIZE		TOTAL 9	% REC.		
WATER	R TABLE DE	РТН ELEV TIN	IE AFTEI	R COMP.		DATE	TAKEN		
TYPE 0	BROUT	QUANTITY	M	IX	DRIL	LING STAF		6/4/2008	
DRILLE	R	D. Willis RECORDER L. Millet APPROV	/ED		DRIL	LING COM	P. DATE	6/5/2008	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	727.87								
1									
2									
3									
4		Red silty CLAY, dry, hard, with gravel, occassional	S-1	4.5-6	10-14-22	36			
5	722 87	tan mottling							
6									
7									
8									
9									
10	717 87	Dark red silty CLAY, dry bard, with gravel grange	S-2	9 5-11	8-14-20	34			
-10	111.01	and tan mottling			0 20				
11									
12									
13									
14									
15	712.87	Dark red clavey SILT dry bard with gravel	S-3	14 5-16	8-13-16	29			
10	112.01	carbonate pebbles			0 10 10	20			
16									
17									
18									
19									
20	707.87	Dark red silty CLAY, drv. hard. with gravel and brown	S-4	19.5-21	7-12-16	28			
		mottling							
21									
22									
23									
24	703.87								

sou	THERN		Hole No. GWA-50R						
Energy	to Serve Yo	r World GEOLOGIC	AL SE	RVICES			Sheet 2 of	5	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	142.9	9 SURF.ELEV.	727	.87
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	702.87	Orange and white silty CLAY, moist, hard, with	S-5	24.5-26	10-8-10	18			
26									
27									
28									
29									
30	697.87	Pink and white silty CLAY, moist, firm, with degraded	S-6	29.5-31	15-16-13	29			
31									
32									
33									
34									
35	692.87	Pink and tan clayey SILT, dry, with trace sand,	S-7	34.5-36	6-21-21	42			
36									
37									
38									
39									
40	687.87	Orange and white silty CLAY, dry, firm, with pebbles	S-8	39.5-41	6-25-14	39			
41		and gravei							
42									
43									
44									
45	682.87	Tan and white silty CLAY, moist, plastic, some dark	S-9	44.5-46	5-5-3	8			
46		orange mouning							
47									
48									
49									
50	677.87	Same as above	S-10	49.5-51	4-5-11	16			
51									
52									
53									
54	672.97	Tan and orange silty CLAY, moist plastic	S-11	54 5-56	7-8-3	11			
56	671.87	occassional white mottling, cobbles	0.11	07.0-00	1-0-0				
			el						

sou	THERN	DRILLI	NG L	OG			Hole No. G	WA-50F	R
Energy	to Serve You	r World GEOLOGICA	AL SE	RVICES			Sheet 3 of	5	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	142.	9 SURF.ELEV.	727	.87
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57	670.87								
58									
59									
60	667.87	Light orange and tan silty CLAY, moist, plastic,	S-12	59.5-61	6-9-7	16			
61		occassional white mottling, gravel							
62									
63									
64									
65	662.87	Tan and orange clayey SILT, moist, plastic, with	S-13	64.5-66	3-7-9	16			
66									
67									
68									
69									
70	657.87	Orange clayey SILT, moist, firm, occassional black	S-14	69.5-71	3-5-8	13			
71		mottling							
72									
73									
74									
75	652.87	Orange clayey SILT, moist, firm, with chert and	S-15	74.5-76	4-7-16	23			
76		carbonate pebbles, saturated last 3"							
77									
78									
79									
80	647.87	White and light tan clayey SILT, moist, firm, orange	S-16	79.5-81	4-6-7	13			
81		and brown mottling							
82									
83									
84									
85	642.87	Light tan silty CLAY, moist, firm, with chert and	S-17	84.5-86	7-7-24	31			
86		carbonate gravel							
87									
88	639.87								

sou	THERN	DRILLI	NG L	.OG			Hole No. G	WA-50F	R
Energy	to Serve You	r World" GEOLOGICA	AL SE	RVICES		4.40	Sheet 4 of	5	
SITE	1	Plant Bowen Dry Gypsum Storage Facility	Sample	Stan	TOTAL DEPTH	142.	SURF.ELEV.	727	.87
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
89	638.87								
90	637.87	Tan clayey SILT, moist, firm, with chert gravel	S-18	89.5-91	4-4-10	14			
91									
92		Auger refusal - 92.0							
93									
94		No recovery		92-97			0.0/5.0		
95	632.87								
96									
97		White fossiliferous carbonate gravel and cobbles,		97-107			0.2/10.0		
98		fractures							
99									
100	627.87								
101									
102									
103									
104									
105	622.87								
106									
107		Tan carbonate as above		107-117			1.5/10.0		
108									
109									
110	617.87								
111									
112									
113									
114									
115	612.87								
116									
117		Same as above							
118				117-127			1.3/10.0		
119									
120	607.87								

sou	THERN	DRILLI	NG L	.OG			Hole No. G	NC-50R	
Energy	to Serve Your	World GEOLOGICA	AL SE	RVICES			Sheet 5 of	5	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	142.9	SURF.ELEV.	727	.87
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
121	606.87								
122									
123									
124									
125	602.87								
126									
127		Same as above		127-137			1.4/10.0		
128									
129									
130	597.87								
131									
132									
133									
134									
135	592.87								
136									
137		Same as above		137-142.9			1.5/6.7		
138									
140	587.87								
141									
142									
143	682.87								
144		142.9 - Bottom of boring							
145									
146									
147									
148									
149									
150									
151									
152									
153									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **727.77** Top of PVC Casing Elevation (feet, NAVD88): **730.59**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **727.77** Top of PVC Casing Elevation (feet, NAVD88): **730.59**

sou	THERN 4	DRILL	NG	LOG			Hole No.	GWC-16	6R
Energy	to Serve Your V	World" GEOLOGIC	AL SI	RVICES			Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн <u>95</u>	SURF.E	LEV. 72	7.77
	LOCATION	Cells 3 and 4	COOR	DINATES N	1505	5877.86	E	2072607.3	8
ANGLE		90 BEARING NA	CONTI	RACTOR	SCS C	FS	DRILL NO.	NA	
DRILLI	NG METHOD	Hollow Stem/ HQ Rock Core NO. SAMPLES	s	Continuo	us	NO. U.D. SAM	MPLES	NA	
	CASING SIZE	6.25" LENGTH 57'	cc	ORE SIZE	4.25"	ΤΟΤΑΙ	L % REC.	NA	
	WATER TAE	BLE DEPTH 72' ELEV. 656' 1	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	12/13/201	1
	TYPE GROUT	NA QUANTITY NA		nix N	IA	DRILLING ST	ART DATE	12/9/2011	
	DRILLER	S. Milam RECORDER D. Brooks APPRO	VED	D. Broc	oks	DRILLING CC	MP. DATE	12/13/201	1
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	727 77	SAND Silty: brown: dry: very fine to fine grained							
	121.11								
1			n						
2									
3									
4									
		SAND, Clayey; red; dry; fine grained with chert fragments							
5	722.77								
6									
7									
0									
9		SAA with pieces of limestone							
10	717.77								
11									
12									
-12									
13									
14		CLAY, Sandy; orange; damp; contains fine grained sand							
15	712.77								
16									
17									
18									
19		CLAY, Silty, Sandy; damp; red; fine grained with chert							
20	707 77	fragments							
		1							
21			1						
22		SAND, Silty; damp; reddish yellow; very fine to fine							
23		granou							
24		CLAY, Sandy; reddish yellow; damp; very fine to fine grained							

sou		DRILLI	NG L	.OG			Hole No. G	WC-16	R
Energy	to Serve Yoı	urWorld" GEOLOGIC	AL SE 4	RVICES		95'	Sheet 2	ot	4
SITE _			Sample	Stan	dard Penetration Test		SURF.ELEV.		1.11
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	702.77	CLAY, Sandy; reddish yellow; damp; very fine to fine							
26		grained with pieces of chert							
27									
28									
29									
30	697.77								
31									
32									
33									
34									
35	692.77								
36									
37									
38		CLAY, Silty, with Sand; orange; damp; very fine to fine grained with pieces of chert and blue grey dolomite							
39									
40	687.77								
41									
42									
43									
44									
45	682.77								
46		1							
47		1							
48		1							
49		1							
50	677.77		1						
51]	1						
52		SAA with less sand							
53]							
54									
55	672.77								
56									

sou	THERN COMP		NG L	OG			Hole No. G	WC-16	२
Energy	o Serve You	r World GEOLOGICA Plant Bowen CCB Disposal Facility Cells 3 and	4 4	RVICES		9	Sheet 3	of 727	4
SITE _			Sample	Stan	dard Penetration Test		SURF.ELEV.		.11
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments 6 inch steel casing	% Rec	RQD
57		Auger refusal at 57' bgs					to 57' bgs		
58		Dolomite; blue grey; hard; slightly weathered							
59									
60	667.77								
61									
62									
63		Clay filled void from 59' to 66.4'							
64									
65	662.77								
66									
67		Dolomite; blue grey; hard; slightly weathered							
68									
69									
70	657.77	Clay filled void from 67.1' to 74.4'							
71									
72									
73									
74									
75	652.77								
76									
77		Dolomite; blue grey; hard; slightly weathered; contains							
78		multiple small horizontal iron stained fractures							
79									
80	647.77								
81									
82									
83									
84	L								
85	642.77								
86		Dolomite; blue grey; hard; slighlty weathered							
87									
88									

sou		DRILLI	NG L	OG			Hole No. G	WC-16F	र
Energy	to Serve You	World" GEOLOGIC	AL SE	RVICES		95	Sheet 4	of	4
SITE _			Sample	Stan	TOTAL DEPTH		SURF.ELEV.		.//
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
89									
90	637.77								
91									
92		multiple horizontal fractures show iron staining and							
93		some solutioning along fracture faces							
94									
95	632.77								
96		BOH @ 95' bgs							
97									
98									
99									
100	627.77								
101									
102									
103									
104									
105	622.77								
106									
107									
108									
109									
110	617 77								
111									
112									
113									
114									
115	612.77		1						
116									
117									
118			1						
119									
120	607.77		1						

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **730.02** Top of PVC Casing Elevation (feet, NAVD188): **733.37**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **730.02** Top of PVC Casing Elevation (feet, NAVD188): **733.37**

sou	THERN A	DRILL	NG	LOG			Hole No.	GWC-17	7R
Energy	to Serve Your V	Vorld ⁻ GEOLOGIC	AL SE				Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн <u>89.5'</u>	bgs SURF.E	LEV. 730	0.02
	LOCATION	Cells 3 and 4	COOR	DINATES N	1506	6069.29	E	2072829.2	9
ANGLE		90 BEARING NA	CONTR		SCS C	FS	DRILL NO.	NA	
DRILLIN	IG METHOD	Hollow Stem/ HQ Rock Core NO. SAMPLES		Continuo	us	NO. U.D. SAM	MPLES	NA	
	CASING SIZE	6.25" LENGTH 30.7'	cc	RE SIZE	4.25"	ΤΟΤΑΙ	L % REC.	NA	
	WATER TAE	BLE DEPTH 70' ELEV. 660' T	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	12/8/2011	
	TYPE GROUT	NANA	N		IA	DRILLING ST	ART DATE	11/21/201	1
	DRILLER	S. Milam RECORDER S. Bearce APPRO	VED	D. Broc	oks	DRILLING CC	MP. DATE	12/8/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	730.02	SAND, Silty; brown; dry; very fine to fine grained with							
1		white chert fragments							
2			1						
2									
3									
4									
5	725.02	CLAY, sandy; yellowish brown; dry; fine grained sand sand with chert fragments							
6		U U							
7									
8									
q									
10	720.02								
11									
12									
13									
14									
15	715.02								
10	110102								
10									
17									
18		CLAY: vellowish brown; moist: soft: slightly plastic							
19									
20	710.02								
21									
22									
23									
24 Form GS	706.02	8							

SOUT		DRILLI	NG L	.0G			Hole No. G	WC-17	R
Energy i	to Serve You	GEOLOGICA		RVICES			Sheet 2	of	4
SITE _	1	Plant Bowen CCB Disposal Facility Cells 3 and	4 Sample	Stan	TOTAL DEPTH	89	SURF.ELEV.	73	0.02
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	Ν	Comments	% Rec	RQD
25	705.02	SAA							
26		3" bed of white chert, HCI-							
27									
28									
29		CLAY; yellowish brown; moist; soft; slightly plastic							
30	700.02						6 inch steel casing		
31	100.02	Auger refusal at 30.7' bgs					to 30.7' bgs		
22									
32		DOLONITE: blue group mierities amell poor verticel fracture							
33		with iron stained faces							
34									
35	695.02								
36									
37									
38									
39									
40	690.02								
41									
42									
43									
44									
45	685.02								
46									
47									
48		fractures with iron staining							
49									
50	680.02								
51									
52									
53									
54									
55	675.02								
56									

sou		DRILLI	NG L	.OG			Hole No. G	WC-17F	२
Energy	to Serve You	GEOLOGICA	AL SE	RVICES			Sheet 3	of	4
SITE _		Plant Bowen CCB Disposal Facility Cells 3 and	4	Oter	TOTAL DEPTH	89.5	SURF.ELEV.	730).02
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	673.02								
58		DOLOMITE; blue grey; hard; fresh							
59									
60	670.02								
61									
62									
63									
64									
65	665.02								
66									
67									
68									
69									
70	660.02	SAA							
71									
72									
73									
74									
75	655.02								
76									
77									
78		DOLOMITE; blue grey; hard; fresh; some horizontal fractures with iron staining; some solutioning along faces							
79									
80	650.02								
82									
83									
84	İ								
85	645.02								
86									
87									
88	642.02								

sou		DRILLI	NG L	.OG			Hole No. G	WC-17F	२
Energy	to Serve You	r World" GEOLOGIC	AL SE	RVICES		89 4	Sheet 4	of	4
SITE _	1		Sample	Stan	dard Penetration Test		SURF.ELEV.	730	0.02
Depth	Elev.	Material Description, Classification and Remarks DOLOMITE: blue grey: hard: fresh: some horizontal	No.	From To	Blows	N	Comments	% Rec	RQD
89		fractures with iron staining; some solutioning along							
90	640.02		1						
91		BOH @ 89.5 bgs							
92									
93									
94									
05	625.02								
95	035.02								
96									
97									
98									
99									
100	630.02								
101									
102									
103									
104									
105	625.02								
106									
107									
108									
100									
109	000.00								
110	620.02								
111									
112									
113									
114									
115	615.02								
116			1						
117									
118									
119									
120	610.02								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **718.92** Top of PVC Casing Elevation (feet, NAVD88): **721.88**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **718.92** Top of PVC Casing Elevation (feet, NAVD88): **721.88**

sou	HERN 4	DRILL	ING I	_OG			Hole No.	GWC-1	8
Energy i	o Serve Your V	World" GEOLOGIC	AL SE	RVICES			Sheet 1	of	3
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн 77	SURF.ELE	718	3.92
	LOCATION	Cells 3 and 4	COOR	DINATES N	1506	6306.70	_Е 20)72929.2	8
ANGLE		90 BEARING NA	CONTR		Boart Lor	ngyear _c	ORILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPLE	S	Continuo	ous	NO. U.D. SAM	PLES	NA	
	CASING SIZE	6" LENGTH NA	CC	RE SIZE	4"	TOTAL	% REC.	NA	
	WATER TAE	BLE DEPTH 71.3' ELEV. 647.62	IME AFT	ER COMP.	1 hour	DAT	E TAKEN	6/6/2011	
	TYPE GROUT		N			DRILLING STA	RT DATE	6/6/2011	
	DRILLER	Boart RECORDER C. Sellers APPRO	VED	D. BIO	JKS	DRILLING CON	MP. DATE	0/0/2011	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N N	Comments	% Rec	RQD
0	718.92								
1		Top Soil							
· ·			1						
2									
3		CLAY, sandy; red; dry; very fine							
4									
5	713 02	SII T: white: very fine							
	110.02		1						
6									
7		SAND; silty; reddish brown							
8									
9			•						
10	700.00	CLAX: sandy: rod: dry; fina							
10	708.92	CLAT, sandy, red, dry, nine							
11									
12									
13									
14		SAND: silty: vellow: damp	1						
14			1						
15	703.92		·						
16		SAA: vollow brown: dry							
17									
18		CHERT; gravel; black							
10		SAND: silty: brownich vellow: moist	1						
19		SAND, SIRY, DIOWINISH YEIIOW, ITIOISE	1						
20	698.92		1						
21		4	1						
22			1						
22]	1						
23		1	1						
24 Form GS	694.92	8							

sou		DRILLI	NG L	.0G		Hole No. GWC-18			
Energy	to Serve You	r World ⁻ GEOLOGIC	AL SE	RVICES		77 /	Sheet 2	of	3
SITE		Plant Bowen CCB Disposal Facility Cells 3 and	4 Sample	Stan	TOTAL DEPTH	//.(SURF.ELEV.	71	8.92
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	Ν	Comments	% Rec	RQD
25	693.92	CLAY; reddish brown; wet							
26									
27									
28									
29									
30	688.92	red and brown mixed throughout							
31									
32									
33									
34									
35	683.92	SAA; with black banding; moist							
36									
37									
38									
39									
40	678.92								
41		\$44							
42									
43									
44									
45	673.92								
46			1						
47									
48									
49		SAA: chert gravel							
50	668.92	or the other graver	1						
51			1						
52									
53									
54									
55	663.92	SAND; silty; dolostone gravel	1						
56			1						

SOUTHERN DRILLING LOG							Hole No. GWC-18			
Energy	to Serve You	Plant Rowen CCB Disposal Facility Cells 3 and	AL SE ₄	RVICES		77	Sheet 3	of	3	
SITE			Sample	Stan	dard Penetration Test		SURF.ELEV.		3.92	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments 6 inch steel casing	% Rec	RQD	
57	661.92						to 57' bgs			
58		Chert gravel; wet								
59										
60	658.92									
61										
62										
63										
64										
65	653.92									
66										
67										
68										
69										
70	648.92									
71										
72		Gravel; chert and dolostone; silty sand; yellowish brown; saturated								
73										
74										
75	643.92									
76										
77										
78		BOH @ 77.0' bgs	1							
79										
80	638.92									
81										
82										
83										
84										
85	633.92									
86										
87										
88	630.92									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **718.97** Top of PVC Casing Elevation (feet, NAVD88): **721.76**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **718.97** Top of PVC Casing Elevation (feet, NAVD88): **721.76**

sou	THERN A	DRILLI	NG I	_OG			Hole No.	GWC-18	ßR
Energy	o Serve Your V	World" GEOLOGIC	AL SE	RVICES			Sheet 1	of	5
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	гн 137	7.5 SURF.ELE		3.97
	LOCATION	Cells 3 and 4	COORI	DINATES N	1506	301.39	2	2072929.4	7
ANGLE		90 BEARING NA	CONTR	RACTOR	Boart Lon	gyear	DRILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPLES	- ;	Continuo	us	NO. U.D. SAM	/IPLES	NA	
	CASING SIZE	6" _{LENGTH} NA	со	RE SIZE	6"	TOTAL	_ % REC.	NA	
	WATER TAE	BLE DEPTH 71.4' ELEV. 647.57 T	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	6/2/2011	
	TYPE GROUT	NA QUANTITY NA	N	nix N	IA	DRILLING ST	ART DATE	6/2/2011	
	DRILLER	Boart RECORDER C. Sellers APPRO	VED	D. Broc	oks	DRILLING CO	MP. DATE	6/2/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Blows	lest N	Comments	% Rec	RQD
0	718.97								
1		Top Soil							
2									
2									
3		CLAY, sandy; red; dry; very fine							
4									
5	713.97	SILT; white; very fine							
6									
-		SAND: oilty raddich brown							
		SAND, Silly, reduisit brown							
8									
9									
10	708.97	CLAY; sandy; red; dry; fine							
11									
12									
12									
13									
14		SAND; silty; yellow; damp							
15	703.97								
16									
17		SAA; yellow-brown; dry							
18		CHERT: gravel: black	1						
10		SAND: situ: brownish vellow: moist	1						
19		Shiy, biownian yellow, moist							
20	698.97								
21									
22									
23									
24	694.97								

sou		DRILLI	NG L	.0G		Hole No. GWC-18R			
Energy	to Serve You	r World GEOLOGICA		RVICES		10-	Sheet 2	of	5
SITE		Plant Bowen CCB Disposal Facility Cells 3 and	4 Somple	Stop	TOTAL DEPTH	137.	5' SURF.ELEV.	71	8.97
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	693.97	CLAY; reddish brown; wet							
26									
27									
28									
29									
30	688.97	SAND; silty; yellow-brown; very fine; moist; had some red and brown mixed throughout							
31									
32									
33									
34									
35	683.97	SAA; with black banding; moist							
36									
37									
38									
39									
40	678.97								
41									
42		SAA							
43									
44									
45	673.97								
46									
47									
48									
49									
50	668.97	onn, uieit giavei							
51									
52									
53									
54									
55	663.97	SAND; silty; dolostone gravel							
56									

sou		DRILLI	NGL	OG			Hole No. G	WC-18F	२
Energy	to Serve You	r World [~] GEOLOGIC/ Plant Bowen CCB Disposal Facility Calls 3 and	AL SE ⊿	RVICES		127	Sheet 3	of	5
SITE	1	Frank Bowen CCB Disposal Facility Cells 5 and	+ Sample	Stan	dard Penetration Test	137.	SURF.ELEV.	/18	3.97
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	661.97								
58		SAA; wet							
59									
60	658.97								
61									
62									
63									
64		Chert Gravel; black; with dry cobbles							
65	653.97								
66		SAND; silty; yellowish brown; damp							
67		SAND; silty; yellowish white; dry							
68									
69									
70	648.97	SILT; sandy; brownish yellow; with dolostone gravel							
71									
72									
73									
74									
75	643.97								
76									
77									
78									
79									
80	638.97								
81									
82									
83									
84									
85	633.97								
86		Delectore: blue grav: clightly weathered							
87		Doiostone, blue gray, slightly weathered							
88	630.97								
sou [.]		DRILLI GEOLOGICA					Hole No. G	WC-18F of	R 5
------------------	--------	------------------------------------------------------	---------------	-----------------	--------------------------------	------	---------------	--------------	--------
SITE		Plant Bowen CCB Disposal Facility			TOTAL DEPTH	137.	.5 SURF.ELEV.	718	8.97
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
121	597.97								
122									
123									
124									
125	593.97								
126									
127									
128									
129									
130	588.97								
131		Dolostone; blue gray; slightly weathered							
132									
133		Dolostone; heavily fractured, gravel sized fragments							
134									
135	583.97								
136									
137		POU @ 127.5' bas							
138									
139									
140	578.97								
141									
142									
143									
144									
145	573.97								
146									
147									
148									
149	569.07								
150	506.97								
152	566.97								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **723.13** Top of PVC Casing Elevation (feet, NAVD188): **726.31**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **723.13** Top of PVC Casing Elevation (feet, NAVDI88): **726.31**

sou		DRILLI	NG I	LOG			Hole No.	GWC-19	9R
Energy l	o Serve Your V	Vorld" GEOLOGIC	AL SE	RVICES			Sheet 1	of	5
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	гн <u>144</u> .	.0' SURF.ELE	v. 72	3.13
	LOCATION	Cells 3 and 4	COOR	DINATES N	1506	395.96	2	073158.3	6
ANGLE		90 BEARING NA	CONTR	RACTOR	Boart Lor	igyear _c	DRILL NO.	NA	
DRILLIN	IG METHOD	Roto Sonic NO. SAMPLES		Continuo	us	NO. U.D. SAM	PLES	NA	
	CASING SIZE	6" _{LENGTH} NA	cc	RE SIZE	4"	TOTAL	% REC.	NA	
	WATER TAE	BLE DEPTH 75.25' ELEV. 647.88 T	IME AFT	ER COMP.	1 hour	DAT	E TAKEN	6/8/2011	
	TYPE GROUT	NA QUANTITY NA		nix N	IA	DRILLING STA		6/7/2011	
	DRILLER	Boart RECORDER C. Sellers APPRO	VED	D. Broc	oks	DRILLING COM	MP. DATE	6/8/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	723.13								
1		Top Soil							
2									
3		CLAY; brownish red; dry							
4									
5	710 13	Chert; white; weathered; dry							
5	710.13								
6									
8		CLAY; sandy; light brown; trace chert gravel							
9									
10	713.13								
11									
12									
13									
14		SAA; yellowish orange							
15	708.13								
16									
17									
18		CLAY; silty; light brown; damp							
19									
20	703 13								
24	100.10								
21		CAND: sills find grained, shert stored, thereit							
22		yellowish orange to light brown							
23									
24 Form GSS	699.13	8							

sou		DRILLI	NG L	.0G			Hole No. G	WC-19	R
Energy	o Serve You	r World" GEOLOGIC	AL SE	RVICES		144	Sheet 2	of	5
SITE _			4 Sample	Stan	TOTAL DEPTH	144	SURF.ELEV.	723	3.13
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	698.13								
26									
27									
28									
29		SAND; silty; light brown; fine-grained; damp							
30	693.13								
31									
32									
33									
34		CLAY; silty; yellowish orange; chert gravel; damp							
35	688.13	trace sand @ 35'							
36									
37									
38									
39									
40	683.13								
41									
42		SAA; saturated							
43									
44									
45	678.13								
46									
47									
48									
49									
50	673.13								
51		<u> </u>							
52		Chert; very fractured							
53			1						
54			1						
55	668.13	CLAT; SIITY; yellowish orange; some chert gravel; damp	1						
56									

sou		DRILL	NG L	OG			Hole No. G	WC-19F	२
Energy	to Serve You	rr World GEOLOGIC		RVICES		4.4.4	Sheet 3	of	5
SITE	ī	Plant Bowen CCB Disposal Facility Cells 3 and	4	Star	TOTAL DEPTH	144	SURF.ELEV.	723	3.13
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	666.13								
58									
59									
60	663.13								
61		SAND; silty; coarse chert gravel; saturated							
62			1						
63									
64									
65	658.13	sand; silty; light tan; very fine-grained							
66									
67									
68									
69									
70	653.13								
71		No recovery; evidence of sand							
72									
73									
74									
75	648.13								
76									
77	646.13								
78									
79		Dolostone; blue gray; fractured							
80	643.13								
81									
82									
83		Void: no recovery							
84	639.13								
85			-						
86		Dolostone and chert gravel; heavily fractured							
87			-						
88 Form GS	635.13	2008							

SOU ¹ Energy 1	THERN COMP	World ⁻ DRILLI		Hole No. G Sheet 4	WC-19F of	۲ 5			
SITE		Plant Bowen CCB Disposal Facility Cells 3 and	4		TOTAL DEPTH	14	4' SURF.ELEV.	723	8.13
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
89									
90	633.13	SAA							
91									
92		Void; no recovery							
93									
94									
95	628.13								
96									
97		Dolostone; chert gravel; fractured							
98									
99									
100	623.13								
101									
102									
103		Void: mud filled							
104									
105	618.13								
106									
107									
108									
109		Dolostone; blue gray; heavily fractured							
110	613.13								
111									
112		Void; mud tilled							
113		l							
114	600.40								
115	608.13	Dolostone; blue gray; heavily fractured							
110									
118									
119									
120	603.13								

sou		DRILLI		Hole No. GWC-19R					
Energy	to Serve You	World [®] GEOLOGICA	AL SE	RVICES		444.0	Sheet 5	of	5
SITE		Plant Bowen CCB Disposal Facility	Sample	Stan	TOTAL DEPTH	144.0	SURF.ELEV.	723	.13
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
121	602.13	Dolostone: blue grav: heavily fractured							
122									
123									
124									
125	598.13								
126			1						
127		Void; gravel filled							
128									
129									
130	593.13								
131									
132									
133									
134									
135	588.13	Dolostone; blue gray; heavily fractured							
136									
137									
138									
139									
140	583.13								
141									
142									
143									
144		BOH @ 144' bgs							
145	578.13								
146									
147									
148									
149									
150	573.13								
151									
152	571.13								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **717.63** Top of PVC Casing Elevation (feet, NAVD188): **720.59**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **717.63** Top of PVC Casing Elevation (feet, NAVD188): **720.59**

sou	HERN A			DRILLI	NG L	.OG			Hole No.	GWC-20	0R
Energy	o Serve Your V	NY Vorld"	GEC	DLOGIC	AL SE	RVICES			Sheet 1	of	3
SITE		Plant Bowen CC	B Disposal Fa	acility			HOLE DEP	тн 100	.0' SURF.ELE	v. 71	7.63
	LOCATION	Cells 3 ar	nd 4		COORD	INATES N	1506	602.14	Е 2	073486.5	53
ANGLE		90 BEARING	NA		CONTR	ACTOR	Boart Lor	ngyear	DRILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic	NC). SAMPLES		Continuo	us	NO. U.D. SAM	/IPLES	NA	
	CASING SIZE	6" LENGTH	NA		CO	RE SIZE	6"	TOTAL	. % REC.	NA	
	WATER TAE	LE DEPTH 84.3' ELE	EV. 633.33	TI	ME AFTE	R COMP.	1 hour	DA	TE TAKEN	6/8/2011	
	TYPE GROUT			NA	М	IX N	IA	DRILLING ST	ART DATE	6/8/2011	
	DRILLER	Boart RECORDER	Sellers/Dyer	APPRO	/ED	D. Broc	oks	DRILLING CO	MP. DATE	6/8/2011	
Depth	Elev.	Material Description, Classi	ification and Remarks		Sample No.	Stand From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	717.63										
1		Top Soil									
2											
2											
3		CLAY; sandy; light brown; med-	-grained;								
4			-								
5	712.63										
6											
7											
8											
9		SAA									
10	707.63										
11											
12											
12											
13											
14											
15	702.63	SAA									
16											
17											
18											
19											
20	697.63	CLAY; silty; yellowish orange									
21											
22											
23											
2.5											
24 Form GS	693.63	3									

sou		DRILLI	NG L	.0G			Hole No. G	WC-20	R
Energy	to Serve You	r World [*] GEOLOGIC	AL SE	RVICES			Sheet 2	of	3
SITE	1	Plant Bowen CCB Disposal Facility Cells 3 and	4	Ctor		100.	.0' SURF.ELEV.	71	7.63
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	692.63	SII T: conductroop clove: mod grained cond: vallowish							
26		orange							
27									
28									
29									
30	687.63	SILT; sandy; chert gravel throughout; yellow; damp							
31									
32									
33									
34									
35	682.63								
36									
37									
38									
39									
40	677.63								
41									
42									
43		SILT; clayey; 20% chert gravel; some med-grained sand							
44									
45	672.63								
46									
47									
48			1						
49		Dolostone @ 47.5'; blue gray; red staining; very fractured							
50	667.63								
51									
52									
53		Void @ 52' to 67'							
54	662.00								
55	002.03								

sou			NG L	OG		Hole No. GWC-20R				
Energy	to Serve You	r World ⁻ GEOLOGIC Plant Bowen CCB Disposal Facility Cells 3 and	AL SE	RVICES		100.	Sheet 3	of	3	
SITE		· ····· · ····· · · · · · · · · · · ·	Sample	Stan	dard Penetration Test		SURF.ELEV.		.03	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD	
57	660.63									
58										
59										
60	657.63									
61		Void								
62										
63										
64										
65	652.63									
66										
67										
68										
69										
70	647.63									
71			1							
72										
73										
74		Dolomicrite; fine-grained; gray; contains prevalent calcine veining in a unimodal direction; sparse oxidation staining;								
75	642 63	weakly laminated in some individual samples								
76	012.00									
77										
79										
70										
20	627 62									
81	037.03									
82										
83										
84										
85	632.63	BOH @ 84.3' bgs	1							
86										
87										
88	629.63									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **720.45** Top of PVC Casing Elevation (feet, NAVD188): **723.07**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **720.45** Top of PVC Casing Elevation (feet, NAVD188): **723.07**

sout		DRILL	NG I	OG			Hole No.	GWC-21	IR
Energy t	o Serve Your V	Vorld" GEOLOGIC	AL SE	RVICES			Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн 89	.5 SURF.EL	ev. 720	0.45
	LOCATION	Cells 3 and 4	COOR	DINATES N	1506	695.89	E	2073784.4	2
ANGLE		90 BEARING NA	CONTR	ACTOR	SCS (CFS	DRILL NO.	NA	
DRILLIN	IG METHOD	Hollow Stem/ HQ Rock Core NO. SAMPLES	3	Continue	ous	NO. U.D. SAM	MPLES	NA	
	CASING SIZE	6.25" LENGTH 49'	cc	RE SIZE	4.25"	ΤΟΤΑΙ	_ % REC.	NA	
	WATER TAE	BLE DEPTH 56.55' ELEV. 663.9	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	12/16/201	1
	TYPE GROUT	NA QUANTITY NA	N	11X	NA	DRILLING ST	ART DATE	12/15/201	1
	DRILLER	Milam RECORDER D. Brooks APPRO	VED	D. Bro	oks	DRILLING CC	MP. DATE	12/16/201	1
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Sta From To	andard Penetration Blows	Test N	Comments	% Rec	RQD
0	720 45								
	120.10								
1		l op Soil							
2									
3									
4									
5	715.45	CLAY; sandy; light brown							
6									
7									
8									
9									
10	710.45								
11									
12		SILT: clavey with trace sand and chert gravel: light brown							
13									
14									
15	705.45								
16									
		SILT; clayey; light brown	1						
1/									
18									
19									
20	700 45		1						
21		SAA; with chert gravel throughout							
22									
23									
24	696 45								
∠→ Form GS	9901 8-19-200	8	1	I	1			1	

sou		ANY	DRILLIN	IG L	OG			Hole No. G	NC-21	R
Energy	o Serve You	<i>r World</i> " Plant Bowen CCB Disposal	GEOLOGICAL Facility Cells 3 and 4		RVICES		89 5	Sheet 2	of	4
SITE				Sample	Stan	TOTAL DEPTH	00.0	SURF.ELEV.).45
Depth	Elev.	Material Description, Classification	and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	695.45	SAA								
26										
27										
28										
29										
30	690.45									
31										
32		SILT; clayey; yellowish orange								
33										
34										
35	685.45									
36										
37										
38										
39										
40	680.45									
41										
42										
43										
44										
45	675.45									
46		SAA; 10% sand								
47										
48										
49										
50	670.45									
51										
52										
53										
54										
55	665.45									
56		Dolostone; blue gray; no fractures								

sou		DRILL		Hole No. GWC-21R					
Energy.	io Serve Your	World" GEOLOGIC	AL SE	RVICES			Sheet 3	of	4
SITE		Plant Bowen CCB Disposal Facility Cells 3 and	Sample	Stan	TOTAL DEPTH	89.:	SURF.ELEV.	720).45
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	663.45								
58			1						
59									
60	660.45								
61									
62		Jolostone; blue gray; fractured; slight red staining							
63									
64									
65	655.45								
66									
67									
68									
69									
70	650.45								
71									
72									
73									
74									
75	645.45								
76									
77									
78									
79									
80	640.45								
81		SAA							
82									
83									
84									
85	635.45								
86									
87									
88	632.45		1						

sou		ANY	DRILLING	LOG			Hole No. G	WC-21F	2
Energy	io Serve You:	r World" Plant Bowen CCB Disposal F	GEOLOGICAL SI	ERVICES		80 4	Sheet 4	of	4
SITE	1		Sampl	e Stan	dard Penetration Test	03.	SURF.ELEV.	720	0.45
Depth	Elev.	Material Description, Classification and	Remarks No.	From To	Blows	N	Comments	% Rec	RQD
89		SAA							
90	630.45	BOH @ 89.5 bgs							
91									
92									
93									
94									
95	625.45								
96									
97									
98									
99									
100	620.45								
101									
102									
103									
104									
105	615.45								
106									
107									
108									
109									
110	610.45								
111									
112									
113									
114									
115	605.45								
116									
117									
118									
119									
120	600.45								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **712.54** Top of PVC Casing Elevation (feet, NAVD188): **715.41**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **712.54** Top of PVC Casing Elevation (feet, NAVDI88): **715.41**

sou	HERN A	DRILL	NG	OG			Hole No.	GWC-22	2R
Energy l	o Serve Your V	Norld" GEOLOGIC	AL SE	RVICES			Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн 11	7' SURF.EL	.ev. 712	2.54
	LOCATION	Cells 3 and 4	COOR	DINATES N	150	6717.93	E	2074105.6	5
ANGLE		90 BEARING NA	CONTR	ACTOR	Boart Lor	ngyear	DRILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPLES	;	Continuo	us	NO. U.D. SAI	MPLES	NA	
	CASING SIZE	6" _{LENGTH} NA	CC	RE SIZE	6"	TOTA	L % REC.	NA	
	WATER TAB	BLE DEPTH 68' ELEV. 644.5 T	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	6/14/2011	
	TYPE GROUT	NA QUANTITY NA	N	nix N	IA	DRILLING ST	ART DATE	6/13/2011	
	DRILLER	Boart RECORDER D. Brooks APPRO	VED	D. Broc	oks	DRILLING CO	OMP. DATE	6/14/2011	
Depth	Fley	Material Description Classification and Remarks	Sample No.	Stan Erom To	dard Penetration	Test	Commonts	% Dee	ROD
Deptil	LIEV.	wateriar Description, Glassification and Remarks		11011110	Biows	N	Comments	% Rec	RQD
0	712.54	SAND Silty brick red dry fine grained							
1									
2									
3									
4									1
5	707.54								
6									
0									1
7									1
8									1
9									1
40	700 54								1
10	702.54	SAND, Clayey; brick red; dry; fine grained with white							1
11		chert fragments							1
12									
13									
									1
14									1
15	697.54								1
16									1
17									
.,			1						
18									1
19									
20	692.54	sand; low plasticity							
04									1
21									
22									1
23									1
24	688 54								
∠+ Form GS	9901 8-19-2008	8	I	I					

sou		ANY	DRILLI	NG L	.OG			Hole No. G	NC-22	R
Energy	to Serve You	er World" Plant Bowen CCB Dise	GEOLOGICA	L SE	RVICES		117'	Sheet 2	of	4
SITE				- Sample	Stan	TOTAL DEPTH		SURF.ELEV.	/1:	2.54
Depth	Elev.	Material Description, Classi	fication and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	687.54	CLAY, Sandy; red and reddish	vellow; damp; fine grained							
26		sand; low plasticity								
27										
28										
29										
30	682.54									
31										
32										
33										
34										
35	677.54									
36										
37										
38										
39										
40	672.54									
41										
42		SAA except fine to medium sar	nd; moist							
43										
44										
45	667.54									
46										
47										
48										
49										
50	662.54	SAND, Silty; tan; moist; mediur	n grained sand with pieces							
51		or highly solutioned limestone								
52										
53										
54										
55	657.54	CLAY, Sandy; tan; moist; fine to	o medium grained sand;							
56										

SOUT		DRILLI	NG L	OG			Hole No. G	WC-22I	۲
Energy t	to Serve You	Right Rowon CCR Disposal Escility Calls 2 and	AL SE	RVICES		4.	Sheet 3	of	4
SITE			4 Sample	Stan	TOTAL DEPTH	1	SURF.ELEV.	712	2.54
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	Ν	Comments	% Rec	RQD
57	655.54	1 bod of white abort					to 57' bgs		
58									
59									
60	652.54								
61		Mud filled void from 58' to 69'							
62									
62									
03									
64									
65	647.54								
66									
67									
68									
69		DOLOMITE: blue grev: hard: slightly weathered							
70	642.54								
71									
72									
73		Void with no recovery from 70' to 85'							
74									
75	637.54								
76									
77									
78									
79									
80	632.54								
81	032.34								
82									
83									
84									
85	627 54								
88	027.04	DOLOMITE: blue grev: bard: slightly weathered	1						
87		Seconde, blue grey, hard, singing weathered							
88	624 54								

sou							Hole No. G	WC-22F	R
SITE	to Serve You	Plant Bowen CCB Disposal Facility Cells 3 and	14		TOTAL DEPTH	117	Silleet 4 SURF.ELEV.	712	
Dopth	Flow	Notorial Description Classification and Remarks	Sample	Stan	dard Penetration Test	N	Commonte		ROD
Depth	Elev.	Material Description, Classification and Remarks	NO.	From To	BIOWS	N	Comments	% Rec	RQD
09	622 54								
91	022.04								
92		Void with no recovery from 88' to 103.5'							
93									
94									
95	617.54								
96									
97									
98									
99									
100	612.54								
101									
102									
103									
104	607 54	DOLOSTONE; blue grey; hard; slightly weathered; contains purple chert inclusions							
106	001.04								
107									
108		DOLOMITE; blue grey; hard; slighlty weathered; horizontal fractures with iron staining along faces							
109									
110	602.54								
111									
112									
113									
114	507 54								
116	031.04								
117									
118		BOH @ 117' bgs							
119									
120	592.54								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **688.02** Top of PVC Casing Elevation (feet, NAVD188): **690.94**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **688.02** Top of PVC Casing Elevation (feet, NAVD188): **690.94**

sou	THERN 4	DRILL	ING I	LOG			Hole No.	GWC-23	R
Energy	COMPA to Serve Your V	Vorld" GEOLOGIC	AL SE				Sheet 1	of	2
SITE	_	Plant Bowen CCB Disposal Facility			HOLE DEP	тн 47.0	0' SURF.ELE	. 688	3.02
	LOCATION	Cells 3 and 4	COOR	DINATES N	1506	6701.61	Е 2	074446.5	3
ANGLE		90 BEARING NA	CONTR	RACTOR	Boart Lor	ngyear D	RILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPLES	3	Continuo	us	NO. U.D. SAM	PLES	NA	
	CASING SIZE	6" LENGTH NA	cc	RE SIZE	4"	TOTAL	% REC.	NA	
	WATER TAE	BLE DEPTH 33.35' ELEV. 654.67	IME AFT	ER COMP.	1 hour	DAT	E TAKEN	6/28/2011	
	TYPE GROUT	NA QUANTITY NA	N	nix N	IA	DRILLING STA	RT DATE	6/28/2011	
	DRILLER	Boart RECORDER C. Sellers APPRO	VED	D. Broc	oks	DRILLING COM	MP. DATE	6/28/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stand From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	688.02								
1		Top Soil							
2									
3									
4									
- -	692.02	CLAY: siltyreddish brown							
5	003.02								
6									
7		Chert; white; dry	1						
8		SILT; clayey; brown; trace chert gravel							
9									
10	678.02								
11									
12									
13									
14									
15	673.02								
16			1						
17		dolostone; some chert; dry	1						
18			1						
19									
20	669.00								
20	000.02								
21		CLAY; silty; reddish brown; chert gravel throughout							
22									
23									
24 Form GS	664.02	0	1						

sou		DRILLI	NG L	.0G			Hole No. G	WC-23	R
Energy	o Serve You	r World" GEOLOGIC		RVICES		A7 4	Sheet 2	of	2
SITE		Fiant Bowen CCB Disposal Facility Cells 3 and	Sample	Stan	TOTAL DEPTH	47.0	SURF.ELEV.	68	8.02
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	663.02								
26			1						
27									
28									
29									
30	658.02								
31									
32		Dolostone; blue gray; very little fractrures red staining at							
33		20							
34									
35	653.02								
36									
37									
38		0 44							
39		SAA							
40	648.02								
41									
42									
43	645.02								
44									
45	643.02	Dolostone; blue gray; very fractured; red staining							
46									
47		POH @ 17.0' bac	1						
48		שטח ש 47.0 bgs							
49									
50	638.02								
51									
52									
53									
54	ļ								
55	633.02								
56									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **673.76** Top of PVC Casing Elevation (feet, NAVD188): **676.57**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **673.76** Top of PVC Casing Elevation (feet, NAVD188): **676.57**

sou		DRILL	NG I	LOG			Hole No.	GWC-24	1R
Energy t	o Serve Your V	World" GEOLOGIC	AL SE	RVICES			Sheet 1	of	2
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	гн 37	.0' SURF.ELI	ev. 673	3.76
	LOCATION	Cells 3 and 4	COORI	DINATES N	1506	694.13	E	2074806.1	1
ANGLE		90 BEARING NA	CONTR	ACTOR	Boart Lor	igyear	DRILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPLES	5	Continuo	us	NO. U.D. SAI	MPLES	NA	
	CASING SIZE	6" _{length} NA	co	RE SIZE	4"	TOTA	L % REC.	NA	
	WATER TAE	BLE DEPTH 23.24' ELEV. 650.52 T	IME AFT	ER COMP.	1 hour	DA	TE TAKEN	6/21/2011	
	TYPE GROUT	NA QUANTITY NA		nix N	IA	DRILLING ST	ART DATE	6/20/2011	
	DRILLER	Boart RECORDER C. Sellers APPRO	VED	D. Broc	oks	DRILLING CO	OMP. DATE	6/21/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	673.76								
1		Top Soil							
2									
3		SAND; silty; brownish red; very fine grained							
4									
	669 76								
	000.70	SAND; silty; red; more silt; 10% clay							
6									
7									
8									
9		SAA							
10	663.76								
11									
12		Dolostone; blue gray; dry							
13									
14									
15	658 76	Chert gravel; with silty clay; trace dolostone pieces							
10	000.10								
10									
1/									
18									
19									
20	653.76	Dolostone; blue gray; very fracture; minimal staining							
21									
22									
23									
24 Form GSS	649.76	8							

SOU		DRILLI	NG L	.0G			Hole No. G	WC-24	R
Energy	to Serve You	World* GEOLOGIC	AL SE	RVICES		37.0	Sheet 2	of	2
SITE			4 Sample	Stan	TOTAL DEPTH	37.0	SURF.ELEV.	673	3.76
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	648.76								
26									
27									
28									
29									
30	643.76								
31		Dolostone and Chart gravel: red staining on the dolostone							
32	641.76	Dolosione and onen gravel, red staining on the dolosion							
33									
34									
35	638.76								
36									
37									
38									
39									
40	633.76								
41									
42									
43									
44									
45	628.76								
46									
47									
48									
49									
50	623.76								
51									
52									
53									
54									
55	618.76								
56									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **673.59** Top of PVC Casing Elevation (feet, NAVD88): **676.42**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **673.59** Top of PVC Casing Elevation (feet, NAVD88): **676.42**

sou	HERN A	DRILLI	NG I	OG			Hole No.	GWC-25	ōR
Energy i	o Serve Your V	Xorld" GEOLOGIC	AL SE	RVICES			Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн 97.	0' SURF.ELI	ev. <u>67</u>	3.59
	LOCATION	Cells 3 and 4	COORI	DINATES N	1506	6494.89	E	2075088.9	
ANGLE		90 BEARING NA	CONTR	ACTOR	Boart Lor	ngyear [DRILL NO.	NA	
DRILLIN	G METHOD	Rotosonic NO. SAMPLES		Continuo	us	NO. U.D. SAM	IPLES	NA	
	CASING SIZE	6 [°] LENGTH NA	CO	RE SIZE	4"	TOTAL	% REC.	NA	
	WATER TAE	BLE DEPTH 22.02 ELEV. 000.97 T	ME AFT	ER COMP.		DAT	TE TAKEN	6/21/2011	
	TYPE GROUT	QUANTITY NA	N		iA 	DRILLING STA	ART DATE	6/21/2011	
L	DRILLER	DUalt RECORDERC. Sellers APPRO	Sample	Stand	dard Penetration	DRILLING COI	MP. DATE	0/21/2011	
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
0	673.59								
1		Top Soil							
2									
3									
4		SILT: clavey: light brown: trace sand: fine: dry							
5	668.59								
6									
7									
8									
9									
10	663.59								
11									
12		SII T: trace sand: very micacous: vellowish orange							
12		one r, nace sand, very meacous, yenewish change							
13									
14									
15	658.59								
16		Chert gravel; well rounded							
17		SILT; sandy; medium grained sand; some chert gravel; light brown							
- 17									
18									
19		SAND;with chert gravel; brownish yellow; medium							
20	653.59	gramoa, wet							
21									
22									
23									
24	649.59	9							

sou	THERN	DRILI	ING L	.OG			Hole No. G	WC-25	R
Energy	to Serve You	GEOLOGI	CAL SE	RVICES			Sheet 2	of	4
SITE		Plant Bowen CCB Disposal Facility Cells 3 ar	nd 4		TOTAL DEPTH	97.0	O'SURF.ELEV.	67	73.59
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	648.59								
26									
27		Dolostone and chert gravel mixed							
28									
20									
20	642.50								
30	643.59								
31		fractured;							
32									
33									
34									
35	638.59								
36									
37									
38									
39									
40	633.59								
41									
42		SAA							
43									
44									
44	000 50								
45	b∠ð.59								
46									
47									
48									
49									
50	623.59								
51									
52		SAA							
53									
54									
55	618.59								
56									

sou							Hole No. G	WC-25	2
Energy i SITE	to Serve You	Plant Bowen CCB Disposal Facility Cells 3 an	d 4	RVICES	TOTAL DEPTH	97.0	Sheet 3	67	4 3.59
Death	Flow	Material Description Classification and Description	Sample	Star	idard Penetration Test	N			POP
Deptn	Elev.	Material Description, Classification and Remarks	INU.	From To	BIOWS	N	Comments	% Rec	RQD
57	616.59								
58									
59									
60	613.59								
61									
62									
63		SAA							
64									
65	608.59								
66			-						
67									
68									
69									
70	603.59								
71									
72		VOID; clay filled with dolostone gravel and trace sand							
73									
74									
75	598.59								
76			_						
77	596.59	Dolostone; blue gray	_						
78									
79									
80	593.59								
81									
82		Dolostone; blue gray; very fracture; heavy red staining							
83		Clay filled void from 83' to 84'							
84									
85	588.59								
86									
87			-						
88 Form GS	585.59	2008							

sou			LING L			Hole No. GWC-25R			
SITE	to Serve You	Plant Bowen CCB Disposal Facility Cells 3 ar	id 4	INVIOLO	TOTAL DEPTH	97.0	O' SURF.ELEV.	67:	4 3.59
Depth	Flow	Material Description Classification and Romarka	Sample	Stan	dard Penetration Test	N	Commonto	01 D	POD
Depth	Elev.	material Description, Classification and Remarks	110.	From To	BIOWS	IN	Comments	% Rec	RQD
09	583 50								
01	303.33								
92		Dolostone; blue gray; heavy red staining; with coarse							
93									
94									
95	578.59								
96									
97									
98	575.59	BOH @ 97' bgs							
99									
100	573.59								
101									
102									
103									
104									
105	568.59								
106									
107									
108									
109									
110	563.59								
111									
112									
113									
114	558 59								
_116									
117									
118									
119									
120	553.59								

JOB NAME Plant Bowen Cells 3 & 4 PROJECT NO. 6122-16-0287 WELL NUMBER GWA-36A INSTALLATION DATE 3/18/2022 LOCATION* NORTH: 1505026.95 EAST: 2073357.46 GROUND ELEV: 680.63 feet NAVD88 WOOD FIELD REPRESENTATIVE T. Parker DRILLER/ CONTRACTOR C. Franklin/Casca GRANULAR BACKFILL MATERIAL 20/40 mesh Silica Filter Sand DRILLING TECHNIQUE Rotosonic SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	de VD88
WELL NUMBER GWA-36A INSTALLATION DATE 3/18/2022 LOCATION* NORTH: 1505026.95 EAST: 2073357.46 GROUND ELEV: 680.63 feet NAVD88 WOOD FIELD REPRESENTATIVE T. Parker DRILLER/ CONTRACTOR C. Franklin/Casca GRANULAR BACKFILL MATERIAL 20/40 mesh Silica Filter Sand DRILLING TECHNIQUE Rotosonic SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	de VD88 ED ARE TIME OF LATION
LOCATION* NORTH: 1505026.95 EAST: 2073357.46 GROUND ELEV: 680.63 feet NAVD88 WOOD FIELD REPRESENTATIVE T. Parker DRILLER/ CONTRACTOR C. Franklin/Casca GRANULAR BACKFILL MATERIAL 20/40 mesh Silica Filter Sand DRILLING TECHNIQUE Rotosonic SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	de VD88 PED ARE TIME OF LATION
WOOD FIELD REPRESENTATIVE T. Parker DRILLER/ CONTRACTOR C. Franklin/Casca GRANULAR BACKFILL MATERIAL 20/40 mesh Silica Filter Sand DRILLING TECHNIQUE Rotosonic SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	de VD88 PED ARE TIME OF LATION
GRANULAR BACKFILL MATERIAL 20/40 mesh Silica Filter Sand DRILLING TECHNIQUE Rotosonic SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	VD88 PED ARE TIME OF LATION
SCREEN MATERIAL 2-inch I.D. Flush Joint Slotted PVC (Sch. 40) BOREHOLE DIAMETER ± 6 inch SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	VD88 PED ARE TIME OF LATION
SLOT SIZE 0.010-inch Machine Cut REFERENCE POINT** ELEVATION* 683.75 ft NA RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	VD88 PED ARE TIME OF LATION
RISER MATERIAL 2-inch I.D. Flush joint Solid PVC (Sch. 40) LOCK TYPE/KEY CODE Master	ED ARE TIME OF LATION
	DED ARE TIME OF _LATION
	DED ARE TIME OF LATION
* Preliminary-Final location/elevation to be determined by As-Built Survey ** Reference point is notch cut in the top of PVC casing WELL CAP WELL CAP	
LOCKABLE STEEL WELL COVER (approx. 2 ft BGS and 3 ft stickup) CONCRETE WELL PAD (4 ft X 4 ft X 4 inches)	ACE
DEPTH TO TOP OF BENTONITE SEAL =29.82 feet. (29.82 to 84.95 ft bentonite chips to water table. 84.95 to 87.30 ft bentonite pellets above sand pack.)	
BENTONITE SEAL (Top at 29.82 ft, Bottom at 87.30 ft) DEPTH TO TOP OF GRANULAR MATERIAL BENTONITE SEAL (Top at 29.82 DEPTH TOP OF SCREEN SECTION = 91.83 feet STABILIZED W LEVEL AFTER DEVELOPMEN = 28.05 FEET	/ATER IT
= 87.30 feet SCREEN GRANULAR BACKFILL CENTERING DEVICES INSTALLED (APPROXIMATE DEPTHS) = N/A BELOW TOP C UENGTH OF SCREEN/ SLOTTED SECTION = 10 feet Section(91.83- 101.83). 9.06 feet slotted (92.28-101.34 feet bgs) DEPTH BOTTOM OF SCREEN SECTION = 101 92 feet	F > N
SUMP/CAP	
BOTTOM OF V	√ELL
WOOOOL Notes: Sand -6.5 bags of 20/40 mesh sand for prepack & screen interval Bentonite - 3 buckets 3/8" uncoated pellets for bentonite seal above the sand filter pack; 7 bags of 3/8" chips added to bring level up to water table Grout - 2 bags of Aqua-guard® bentonite/grout mix with ~40 gals water Review: RNQ Date: 3/27/2022	r d



GWA-36A BORING LOG

PROJECT NUMBER 6122160287 PROJECT NAME Plant Bowen CLIENT Georgia Power ADDRESS 317 Covered Bridge Rd., Euharlee GA

LOCATION Cells 3 & 4

DRILLING COMPANY Cascade Drilling DRILLER Cory Franklin RIG TYPE/METHOD Terrasonic CC150/SONIC CASING DIA. 2-in I.D. PVC BORING DEPTH 102.9 ft COORDINATES N 1505026.95, E 2073357.46 COORD SYS Ga State Plane West (NAD 83) COMPLETION Stick-up w/ protective casing GROUND SURFACE ELEV. 680.63 ft NAVD 88 WELL TOC ELEVATION 683.75 ft NAVD 88

COMMENTS Start drilling on 3/16/2022 and complete drilling on 3/16/2022. Well construction completed on 3/18/2022 with installation of well cover and concrete pad. Well surveyed on 3/22/2022.

LOGGED BY T. Parker CHECKED BY R. Quinn

Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	nscs	v	Elevation (ft)	
- - 2	0-10	#1 (96%)		Fine grain silty CLAY, moist, mottled light brown/yellow/orange. Low to med. plasticity with white weathered limestone fragments (<3%), 1 to 5 mm, subangular to subrounded.	CL			- 680 - - - 678
- 4								- - 676 -
								674
- - - 10	10.20	#2		Fine grained silty CLAY mottled light brown at ton transitioning	CI			- 672 - -
12	10-20	#2 (76%)		to mottled orange/red silty clay at 12.1 ft to 14.3 ft and then back to mottled light yellow/orange silty clay, stiffening in lower 1 ft. Low plasticity. ~5% limestone/chert fragments and rocks, 2 to 60 mm.				- 670 - - - 668
_ 14 							Bentonite	- 666
16 							grout mix	_ 664
18 -								 662
20 22	20-30	#3 (100%)		Fine silty CLAY, mottled light brown to yellow/orange with some light tan and red/orange and more clayey (28 ft - 30 ft). ~5% weathered limestone (white) fragments and rocks, 2-20 mm, subrounded	CL			_ 660
 24								- 658 - -
 26								- 656 - - - 654
_ 28 								- - - - 652
_ 30								_
- - 32	30-35	#4 (100%)		Fine silty mottled CLAY, higher moisture content with high plasticity and 25-35% weathered limestone and chert, 2-80 mm. Cobble at 35 ft.			Bentonite seal (chips 29.82-84.95 ft,	650
_ _ 34							84.95-87.30 ft, both prior to hydration).	- 648
			1XXXII			K////X (/////	⊢ 646

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 14 Apr 2022



Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Wel	Diagram	Elevation (ft)
- 36 - - - - 38	35-40	#4 (100%)		Fine silty mottled CLAY, higher moisture content with high plasticity and 25-35% weathered limestone and chert, 2-80 mm. Cobble at 35 ft.	CL			- - - 644 - -
_ _ _ 40								- 642 - -
- 42	40-50	#5 (100%)		Gravelly, silty CLAY, mottled light brown and yellow, medium stiff, slight plasticity, ~50% fine gravel/gravel/cobble mix of weathered limestone and chert up to 140 mm (at 45.5 ft). Moisture increased and core is wet from 49 ft to 50 ft.	CL			- 640 - -
 44								- 638 - - -
- 46								- 030 - - - 634
- 48								- 632
- 50	50-60	#6		Gravelly fine silty CLAY, wet, yellow/white/tan, soft with ~50% fine gravel/ gravel/cobble. No plasticity. Angular limestone/chert	CL			- - - 630
		(20%)		fragments throughout, fine to coarse angular chert gravel and angular to subrounded cobble up to 140 mm. Poor recovery (2 ft out of a 10 ft run).			Bentonite seal (chips	- - 628
54 							29.82-84.95 ft, prior to hydration,	- 626
56 							84.95-87.30 ft, prior to hydration). Top	- 624
58 - 60							of bentonite seal at 27.00 ft after hydration.	- 622 -
- 62	60-70	#7 (80%)		Gravelly fine silty CLAY, upper 4 ft mottled yellow/orange/white, 4 to 8 ft brown/orange/white. Upper 2 ft of recovered core very wet, 2 to 8 ft recovered core is moist. ~50% fine gravel/gravel mix of weathered limestone. dolomite and chert.	CL			- 620
- 64								618
- - - 66								- 616
- 68								- 614 - - - 612
_ 70	70-80	#8		Gravelly fine silty CLAY mottled vellow/light to dark brown. Verv	CI			-
- 72		(98%)		soft, high plasticity. 50% gravel and cobbles up to 110 mm. Angular dark grey/black chert 70-80 ft. Manganese lens at 79.5 ft of recovered core. Upper 1 ft very wet then moist then wet at about 77 - 78 ft				600
_ 74				about / / - / 0 IL				- 606
76								604

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 14 Apr 2022



Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well D	iagram	Elevation (ft)
- 78							Bentonite seal (chips	- - - 602
80 	80-90	#9	1 4° X	No recovery.			29.82-84.95 ft, prior to hydration,	600
- 82 		(0%)					pellets 84.95-87.30 ft, prior to	_ 598 -
84 							hydration). Iop of bentonite seal at 27.00 ft after hydration.	- 596 -
86 								_ 594
88 								_ 592
90 	90-100	#10	1. S	Gravelly SILT yellow/light brown, wet with >50% mix of fine gravel and gravel up to 60 mm, composed of angular chert,	ML-GM			_ 590 _
		(10%)		minor quartz, and dolomite. Bedrock at 100.5 it				
94 							Sand filter pack and	
- 96 							pre-pack screen	- 584
98 								
- 100 	100-102.9	#11		100.0 - 100.5 ft Gravelly SILT. 100.5 - 102.9 ft Dolomite, light gray, no fines.	Rock			- 580
102 		(34%)						_ 578
104				Boring terminated at 102.9 feet in bedrock				
 106								- - 574
_ 108 _								
 110								
- 112 								- 568
- - - 114								566
 116								
- 118								562
1	1	1	1	1	1	1		- 502

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 14 Apr 2022
	WELL INS	STALLATION	N RECORI	D	
JOB NAME Plant Bowe	n Cells 3 & 4		PROJECT NO	6122-16	6-0287
WELL NUMBER GWA-36	RA		INSTALLATIC	ON DATE 7/2	/2021
LOCATION* NORTH: 15050	60.13 EAST: 207336	5.45 GF	ROUND ELEV:	682.26 feet N	NAVD88
WOOD FIELD REPRESENTATI	VE A. Shoredits		DRILLER/ CO	NTRACTOR	Cascade
GRANULAR BACKFILL MATER	RIAL #1 Silica Filter San	nd	DRILLING TE		lotosonic
SCREEN MATERIAL 2-inch I	.D. Flush Joint Slotted F	VC (Sch. 40)	BOREHOLE		±6 inch
SLOT SIZE 0.010-ii	nch Machine Cut		REFERENCE	POINT** ELEVA	TION* 685.20 ft NAVD88
RISER MATERIAL 2-inch	I.D. Flush joint Solid PV	C (Sch. 40)	LOCK TYPE/ł		aster
 * Preliminary-Final location/eleva ** Reference point is notch cut in 	tion to be determined by As-Bui the top of PVC casing	It Survey	NOTE: N RELATIVE	NOT TO SCALE, TO EXISTING G	ALL DEPTHS RECORDED ARE ROUND SURFACE AT TIME OF
	WELL CAP				INSTALLATION
LOCKABLE STEEL WELL		_			
(approx. 2 ft BGS and 3 ft	stickup)		NGTH OF W	/ELL	
CONCRETE WELL PAD		= 2	ICKUP .24 feet		
(4 ft X 4 ft X 4 inches)					GROUNDSURFACE
DEPTH TO TOP OF			-		
BENTONITE SEAL	GROUT				TOTAL DEPTH
=25 feet. (25 to 77 ft bentonite chips to water			GTH OF RIS	SER/	= 109.4 FEET
table. 77 to 96 ft bentonite		SOL	D SECTION	١	
		= 99	ieet		
	Tom at OF #				
Bottom at 96 ft)			DEPTH TO	OP OF	LEVEL AFTER
DEPTH TO TOP OF			SCREEN S	SECTION	DEVELOPMENT =33.78 FEFT
= 96 feet			<u>= 99 leet</u>		BELOW TOP OF
	-				WELL STICKUP
		LEN	GTH OF SC	REEN/	= 7/8/2021
		SLO	TTED SECT 0 feet	TION	
GRANULAR BAC					
CENTERING DEVICES II					
(APPROXIMATE DEPTH	s)		SCREEN	SECTION	
			= 109 feet		
			GTH OF SL	JMP & CAP	
	SUMP/CAP	$\int = 0.3$	53 feet		V
	<u> </u>				BOTTOM OF WELL
	Notes:				
wood	Sand – 2.3 bags of #1 sand for prep Bentonite – 5 buckets 3/8" coated an	ack & screen interval nd uncoated pellets for	or bedrock plug;	Wel	I Installation Record
	r pags of 3/8" chips added to above Grout – 2 bags of bentonite mix with	groundwater elevation ~50 gals water	n		
	Review: <u>RNQ</u>	Date: <u>8/12/20</u>	21		GWA-36KA



GWA-36RA BORING LOG

PROJECT NUMBER 6122160287 PROJECT NAME Plant Bowen CLIENT Georgia Power ADDRESS 317 Covered Bridge Rd., Euharlee GA

LOCATION Cells 3 & 4

DRILLING COMPANY Cascade Drilling DRILLER C. Franklin RIG TYPE/ METHOD TSI CC150/ SONIC CASING DIA. 2-in I.D. PVC BORING DEPTH 109.5 ft COORDINATES N 1505060.13, E 2073365.45 COORD SYS Ga State Plane West (NAD 83) COMPLETION Stick-up w/ protective casing SURFACE ELEVATION 682.26 ft NAVD 88 WELL TOC 685.20 ft NAVD 88

COMMENTS Start drilling on 6/29/2021 and complete drilling on 6/30/2021. Well construction completed on 7/2/2021 with installation of well cover and concrete pad.

LOGGED BY A. Shoredits CHECKED BY J. Quinn

Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	nscs	Well Diagram	Elevation (ft)
- 4 - 6 - 8 - 10	0-10	#1 (0%)		Air knife utility clearance No sample	-		- 678 - 678 - 676 - 674
- 10 - 12 - 14	10-20	#2 (56%)		No sample		Bentonite	grout 672
- 16				Gravelly silty SAND with clay, red/grey/black, loose, dry, coarse angular chert Gravelly silty SAND, tan/grey, very loose, dry	SW-SC SM		- 666
- 18 	20-30	#3		CLAY with silts, yellow/umber/orange, medium stiff, slight plasticity, dry, some fine gravel CLAY, yellow/white/tan, soft, high plasticity, moist, chert fragments throughout, fine to coarse angular gravel	CL CH		- 664 - 662
		(100%)		21 ft cobble sized rounded chert			- 660 - 658
							656
- 28 - 30	30-40	#4		No recovery	-	Bentonite (chips)	seal 654
32		(0%)		Drill casings did not appear to drop during drilling. Very soft clays and gravel are estimated to be present at 30-40 feet and were not retained in the sampling casing.			-

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 18 Aug 2021



Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	USCS	Well [Diagram	Elevation (ft)
34								- 648
- 36								646
- 38								644
- 40	40-50	#5		CLAY with gravels, fine to coarse grained, yellow/black/red, very soft, high plasticity, wet, angular dark grey/black chert	СН			642
42		(100%)		throughout				640
44 								638
- 46				CLAY, yellow/tan, soft, high plasticity, moist, trace quartz gravel				636
- 48				Sandy CLAY, purple/brown/red/brown, very stiff, low plasticity, moist, coarse to fine quartz gravel throughout, sub-angular to sub-rounded, some fine sand	CL			- 634
50				Silty CLAY, yellow/black, stiff, medium plasticity, moist, trace fine quartz gravel throughout, sub-angular	СН			632
	50-60	#6		Gravelly SAND, fine to coarse grained, grey/brown, loose, wet	SM-SP/			
- 52		(100%)		decomposed sandstone texture with oxidation Gravelly CLAY, dark brown/yellow, very soft, low plasticity, fine to coarse angular quartz gravel	CL-GC		Bentonite seal (chips)	630
			<i></i> , <u>,</u> , , , , , , , , , , , , , , , , ,					628
- 56				CLAY with gravels, brown/tan/orange, soft to medium stiff, medium to high plasticity, moist, coarse sub-rounded quartz and sandstone gravel	CH-CL			626
- 58								624
- 60	60-70	#7		Silty CLAY, yellow, medium stiff, medium plasticity, moist,	CL			622
62		(100%)		sub-rounded quartz cobble and angular dark grey chert cobble Sandy CLAY and gravel, brown/tan/yellow, soft, low to medium plasticity, moist to wet, fine to coarse sub-rounded quartz gravel and rounded cobbles	CL-SW			620
- 64								618
- 66								616
- 68 -								614
- 70	70-80	#8						- 612
_		^{π0}						-
- 72		(80%)						610

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 18 Aug 2021



Depth (ft)	Samples	Sample Run (Recovery)	Graphic Log	Material Description	nscs	Well D	iagram	Elevation (ft)
- 74							Bentonite seal (chips)	- 608
- 76								- - 606 -
- 78				Dolomite, dark grey, moist (acid test confirmation)	-			604
- 80	80-85	#9						602
82		(100%)		Decomposed dolomite with sub-rounded quartz gravel inclusions and cobbles, wet				- 600 -
- 84				00.2-00 it intolation sendy day				- 598
	85-90	#10 (20%)					Bentonite seal	-
- 90	90-98	#11		Dolomite, dark grey, wet, no visible decomposition 95-95.3 ft brown surface staining				- 592
- 92		(38%)		96.8 ft sub-rounded quartz gravel inclusion				- 590
- 94								- 588
- 96						 ••,		- 586
	98-108	#12		Clavey GRAVEL grey/grange loose moist to wet angular	60-50			-
 100	30-100	(100%)		gravel with orange sticky clay matrix/cement	CL-SC			
- 102				moist, fine grained sands		· · , · · ·	Sand filter pack	
				Dolomite, fractured with interstitial clays, grey/brown/tan, moist 103.7-104 ft silty sand, brown	-		and pre-pack	578
				105-105.6 dry rock lens		•••,		E70
- 106								- 5/6
- 108 - -								- 574 - -
— 110 				Boring terminated at 109.5 feet in bedrock				- 572
112								570

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 18 Aug 2021

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **700.44** Top of PVC Casing Elevation (feet, NAVD188): **703.72**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **700.44** Top of PVC Casing Elevation (feet, NAVD188): **703.72**

sou	HERN 4	DRILL	NG I	LOG			Hole No.	GWA-3	7
Energy 1	o Serve Your V	NY Norld GEOLOGIC	AL SE	RVICES			Sheet 1	of	4
SITE		Plant Bowen CCB Disposal Facility			HOLE DEP	тн 104	.5' SURF.ELE	ev. 700).44
	LOCATION	Cells 3 and 4	COOR	DINATES N	1505	5345.45	E	2073069.3	2
ANGLE		90 BEARING NA	CONTR	RACTOR S	CS Field	Services [DRILL NO.	NA	
DRILLIN	G METHOD	Hollow Stem Auger NO. SAMPLES	š	Continuo	us	NO. U.D. SAM	IPLES	NA	
	CASING SIZE	NA _{length} NA	cc	RE SIZE	4"	TOTAL	% REC.	NA	
	WATER TAE	BLE DEPTH 45' ELEV. 655.44	IME AFT	ER COMP.	1 hour	DAT		9/11/2013	8
	TYPE GROUT	NA QUANTITY NA	N		IA	DRILLING STA		9/9/2013	
	DRILLER	Denty RECORDER D. Brooks APPRC	VED	D. Broc	oks	DRILLING CO	MP. DATE	9/11/2013	5
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	700.44	SAND, Silty; reddish brown; dry; very fine to fine							
1		grained sand							
		SAA except red, line grained							
3									
4									
5	695.44								
6		SAND, Clayey; brick red; damp; very fine to fine grained							
8									
9									
10	690.44								
11		SAA except red and vellow							
10									
12									
13									
14									
15	685.42								
16									
17									
18									
19		SAND Silty vellow and white damp; fine to medium							
20	680.44	grained with white chert fragments							
21									
22	678 11								
	070.44								
23			1						
24	676.44	2							

sou		DRILLI	NG L	.0G			Hole No. G	WA-37	7
Energy	o Serve You	GEOLOGIC	AL SE	RVICES		404	Sheet 2	of	4
SITE	1	Plant Bowen CCB Disposal Facility Cells 3 and	4 Sample	Stan	dard Penetration Test	104.:	SURF.ELEV.	70	0.44
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	675.44	CLAV Sandy: vellow and white: damn: very fine to fine							
26		grained sand with small grey chert fragments							
27									
28									
29									
30	670.44								
31									
32									
33									
34									
35	665.44								
36									
37									
38									
39									
40	660.44								
41									
42		SAA with grey chert increasing in content and size; moist							
43									
44									
45	655.44								
46									
47			1						
48									
49		SAND, Clayey; yellow and white; moist; fine to medium arained	1						
50	650.44		-						
51									
52		CLAY, Sandy with Silt; pale yellow; moist; very fine to fine grained sand with white chert fragments							
53									
54									
55	645.44								
56			1						

sou		ANY	DRILLING	LOG			Hole No.	GWA-37	
Energy	to Serve You	ur World" Plant Bowen CCB Disposal Eacilit		ERVICES		104 4	Sheet 3	of	4
SITE _			Sam	ole St	TOTAL DEPTH andard Penetration Test		SURF.ELEV.	700).44
Depth	Elev.	Material Description, Classification and Rema	rks No	From To	Blows	N	Comments	% Rec	RQD
57		4							
58		CLAY, Sandy with Silt; pale yellow; moist; ve	ery fine to						
59		tine grained sand with white chert tragments							
60	640.44								
61									
62									
63									
64									
65	635 44								
00	033.44	•							
00									
67		•							
68		-							
69									
70	630.44								
71		-							
72									
73		SAA except mottled pale vellow, vellow, and	brown						
74									
75	625.44								
76									
77									
78									
79									
80	620.44								
81									
82									
83									
84									
85	615.44								
86									
87		CLAY, Sandy; brownish yellow; wet; very so	ft; fine						
88	612.44	grained sand							
Form GS	9901 8-19-	-2008							_

sou				.OG			Hole No. C	GWA-37	4
SITE	to Serve You	Plant Bowen CCB Disposal Facility Cells 3 and	4	INTIOLO	TOTAL DEPTH	104	I.5 SURF.ELEV.	700	- -).44
Dopth	Floy	Material Description, Classification and Romarka	Sample No.	Stan	dard Penetration Test	N	Commonts	% Daa	POD
90	LIEV.	CLAX Sandy: brownish vallow: wat: vonv coft: fina		TIGHTIG	DIOWS	N	Comments	% Rec	RQD
09	610.44	grained sand							
90	010.44	SAND. Clovey: vellow and brown: wat: fine grained							
91		with fragments of grey chert							
93		CLAY, Sandy; yellow and brown; wet; fine to medium							
94		grained sand with chert and dolomite cobbles							
95	605.44								
96									
97									
98									
99		SAND, Clayey; yellow and brown; wet; fine grained							
100	600.44	with tragments of grey chert							
101									
102									
103									
104		DOLOMITE; blue grey; nard; slightly weathered; fractured with iron staining							
105	595.44	BOH @ 104.5 bgs							
106									
107									
108									
109									
110	590.44								
111									
112									
113									
114									
115	585.44								
116									
117									
118									
119									
120	580.44								

Form GS9901 8-19-2008

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **713.32** Top of PVC Casing Elevation (feet, NAVD188): **716.24**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **713.32** Top of PVC Casing Elevation (feet, NAVD188): **716.24**

sou	HERN 4	DRIL	LING	LOG			Hole No.	GWA-3	8
Energy	compa to Serve Your V	World GEOLOG	ICAL SI	ERVICES			Sheet 1	of	3
SITE		Plant Bowen CCB Disposal Facility	/		HOLE DEP	тн7(6' SURF.E	ELEV. 713	3.32
	LOCATION	Cells 3 and 4	COOR	DINATES N	1505	5501.33	E	2072831.7	7
ANGLE		90 BEARING NA	CONT	RACTOR	Boart Lor	ngyear	DRILL NO.	NA	
DRILLIN	IG METHOD	Rotosonic NO. SAMPI	ES	Continuo	us	NO. U.D. SAI	MPLES	NA	
	CASING SIZE	6" _{LENGTH} NA	co	DRE SIZE	4"	ΤΟΤΑ	L % REC.	NA	
	WATER TAE	BLE DEPTH 45.15' ELEV. 668.17	TIME AFT	ER COMP.	1 hour	DA	TE TAKEN	6/13/2011	
	TYPE GROUT	NA QUANTITY NA		MIX N	IA	DRILLING ST	ART DATE	6/13/2011	
	DRILLER	Boart RECORDER D. Brooks APP	ROVED	D. Broo	oks	DRILLING CO	OMP. DATE	6/13/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	dard Penetration Blows	Test N	Comments	% Rec	RQD
0	713 32								
1		SAND, Silty; red and yellowish red; dry; very fine to fine							
		granioù							
2		-							
3		-							
4									
5	708.32	-							
6									
7									
8									
9									
- 10	700.00	SAA except damp							
10	703.32	-							
11		-							
12		•							
13									
14			_						
15	698.32	CLAY, Silty; white to pale yellow; damp; no plasticity							
16									
17									
18									
19		CLAY, Sandy, Sitly; mottled pale yellow and brown; damp; no plasticity							
20	693.32								
21									
22									
22		1							
23		1							
24 Form GS	689.32	 							

sou	THERN COMP	DRILL	ING L	.OG			Hole No. G	GWA-38	3
Energy	to Serve You	ur World" GEOLOGIC		RVICES		76	Sheet 2	of	3
SITE			14 Sample	Stan	dard Penetration Test	/0	SURF.ELEV.	71	3.32
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	688.32	CLAY, Sandy, Sitly; mottled pale yellow and brown;							
26		at 25.5 to 26.5 feet							
27		-							
28									
29									
30	683.32	_							
31		CLAX Silty Sandy reddich yellow strong brown and							
32		and black; moist; fire to medium grained sand with							
33		pieces of weakly cemented sandstone							
34		_							
35	678.32	_							
36		-							
37									
38									
39									
40	673.32								
41									
42									
43		-							
44									
45	668.32								
46									
47									
48		SAA							
49		_							
50	663.32	4							
51		4							
52		4							
53		4							
54		4							
55	658.32	4							
56									

sou	THERN COMP						Hole No. (GWA-38	
Energy I	o Serve Yoı	Plant Bowen CCB Disposal Facility Cells 3 and	4	RVICES	TOTAL DEPTH	76	Sheet 3 SURF.ELEV.	713	3 3.32
			Sample	Stan	dard Penetration Test				
Depth	Elev.	Material Description, Classification and Remarks	INO.	From To	Blows	N	Comments	% Rec	RQD
57	656.32								
58		CLAY, Silty, Sandy; reddish yellow, strong brown, and							
59		and black; moist; fine to medium grained sand with pieces of weakly cemented sandstone							
60	653.32	•							
61									
62									
63									
64									
65	648.32								
66									
67									
68									
69									
70	643.32	SAA with lenses of water bearing purple chert/ gravel							
71									
72									
73									
74									
74	620.22								
75	030.32								
76									
- / /		BOH @76 bgs							
78									
79									
80	633.32								
81									
82									
83									
84		•							
85	628.32	•							
86		•							
87 99	625.20	1							

Form G\$9901 8-19-2008

		Log updated with revised survey certified 3/ Ground Surface Elevation (feet, NAVD88): 7(Top of PVC Casing Elevation (feet, NAVD188	23/202 05.81): 708. !	21 58	BORING GWA-51R
SO EAF	DUTHE RTH S	HERNARD LOG OF TEST BO KOMPANY PROJECT Land RN COMPANY SERVICES, INC. PROJECT Land CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	RING	acement M	Monitoring Wells
DATE CONT DRILI BORI NOTE	E STAF FRACT LED B NG DE	RTED 2/18/2016 COMPLETED 3/1/2016 SURF. ELEV. 705.81 TOR Cascade EQUIPMENT Tracked METHOI Y T. Ardito LOGGED BY W. Shaughnessy CHECKED BY B. EPTH 92 ft. GROUND WATER DEPTHDURING 45 ft. COM	C <u>Rotos</u> Smelser IP. <u>50.4</u>	OORDINA sonic f f ft.	ATES: <u>N 1505310.36 E 2073781.34</u> ANGLE BEARING DELAYED _41.2 ft. after 72 hrs.
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate HCL Strong	BSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Silt (ML) - mottled red (2.5YR 4/8) and yellow / pale yellowish orange (10YR 8/6) dry, with sand and clay - some gravel seams			Surface Seal:
<u>10</u>	-	 mottled red / moderate reddish brown (10R 4/6) and brownish yellow (10YR 6/8) dry, soft, low plasticity medium stiff 			Annular Fill: Portland Cement-Bentonite
<u>15</u> 20		- brownish yellow (10YR 6/8) - mottled yellow (10YR 7/8) and black (10YR 2/1) dry, medium stiff, few seams of fine-gravel and white sand			Grout (4 - 94lbs bags PC, 1 - 50lbs bags Gel, 45 gal. Wate
<u>25</u> 30		- very damp - mottled yellow (10YR 7/6) and black (10YR 2/1) medium stiff, with white coarse-sand and weathered gravel			
35		- with coarse gravel			Annular Seal: Pel-Plug 3/8 Bentonite Coate Pellets (0.5 - 5gal buckets (78.5'-75.0')) and Baroid Hole Plug 3/8 Chips (15 - 50lbs ba (75.0'-22.0'))
<u>40</u>		Elastic Silt (MH) - dark yellowish brown (10YR 4/4), yellow (10YR 7/6) and black (10YR 2/1) wet, medium stiff			



S	OUT	LOG OF TEST BO	RINC	3			BORING GWA-51R Z PAGE 2 OF 2 <u>GPC633179</u>
SO	UTHER	N COMPANY SERVICES INC PROJECT Land	dfill Rep	lacement	Mon	itorin	g Wells
EAI	RTH SC	IENCE AND ENVIRONMENTAL ENGINEERING LOCATION Pla	nt Bowe	n			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION UNDER UND	Weak Moderate Strong	3ROUNDWATER DBSERVATIONS	Co pro 4-1	omple otecti foot s	WELL DATA etion: ive aluminum cover with bollards; square concrete pad
		Elastic Silt (MH)(Con't)	220	00			
50		Clayey Gravel (GC) - reddish yellow (7.5YR 6/6) wet - some cobbles, pulverized rock Dolostone	_				←
55		 grayish brown (2.5Y 5/2) and gray (10YR 5/1) hard medium dark gray (N4) and dark greenish gray (5GY 4/1) fine grain, hard, not to slightly weathered on fractures weathered, slightly fractured, 					
<u>60</u> 65		carbonate, thin fractures healed with calcite					Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (0.5 - 5gal buckets (78.5'-75.0')) and Baroid Hole Plug 3/8 Chips (15 - 50lbs bag (75.0'-22.0'))
<u>70</u> 75		- dark gray (N3) fine grain, hard, not to slightly weathered, medium to thick bedded, slight to moderately fractured, vertical and cross-cutting thin fractures, calcite healed fractures					
80		- dark gray (N3) and black (N1) fine grain, hard, not to slightly weathered, medium to thick bedded, slight to moderately fractured, low carbonate reaction, fractures healed with calcite, fractures up to 2 inch, cross-cutting, brown-yellow water staining on fractures					Filter: ←Filter Media 20/40 Silica Sand (- 50 lbs bags)
85							Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
90		- LITICK TO MASSIVE DECICEO			甩		
95		Bottom of borehole at 92.0 feet.					Backfill:Filter Media 20/40 Silic Sand (0.25 - 50 lbs bags (92.0'-91.0')) ¢ave-in to 92 ft.

ANDFILL REPLA		Log updated with revised survey certified 3/2 Ground Surface Elevation (feet, NAVD88): 70 Top of PVC Casing Elevation (feet, NAVDI88):	23/2021 5.81 : 708.58	BORING	GWA-51RZ
SO SON EAR	DU ' UTH RTH	ERN COMPANY SERVICES, INC. SCIENCE AND ENVIRONMENTAL ENGINEERING BCIENCE AND ENVIRONMENTAL ENGINEERING	RING ill Replacement t Bowen	t Monitoring Wells	GPC633179
ILINO ILING 1010100	E STA FRAC LED NG E	ARTED 2/18/2016 COMPLETED 3/1/2016 SURF. ELEV. 705.81 CTOR Cascade EQUIPMENT Tracked METHOD BY T. Ardito LOGGED BY W. Shaughnessy CHECKED BY B. S DEPTH 92 ft. GROUND WATER DEPTHDURING 45 ft. COMI	COORDIN Rotosonic Smelser P. 50.4 ft.	NATES: <u>N 1505310.36 E 2</u> _ ANGLE BEA BEA BEA BEA BEA BEA BEA BEA	ARING 72 hrs.
TS(GA-BOWEN/LANDFILL DEPTH (ft)	GRAPHIC	MATERIAL DESCRIPTION	Weak Woderate REACTION Strong	COMMENTS	Natural Gamma
XICIVIL TECH SUPPORTURILLING/PROJEC		Silt (ML) - mottled red (2.5YR 4/8) and yellow / pale yellowish orange (10YR 8/6) dry, with sand and clay - some gravel seams - mottled red / moderate reddish brown (10R 4/6) and brownish yellow (10YR 6/8) dry, soft, low plasticity - medium stiff	> ≥ 0) (Reco and 7f (Reco (17ft.)	very=100% between 0 t.) very=95% between 7 and	M. M. W.
	-	- brownish yellow (10YR 6/8) - mottled yellow (10YR 7/8) and black (10YR 2/1) dry, medium stiff, few seams of fine-gravel and white sand	(Reco and 27	very=100% between 17 /ft.)	MWWWWWWWWWWWWWWWWWWWWWWW
400 25 30/16 16:52 - 300 30	-	- very damp - mottled yellow (10YR 7/6) and black (10YR 2/1) medium stiff, with white coarse-sand and weathered gravel	(Reco and 37	very=90% between 27	Marin Mapping Maring
100 COLOR GAMMA - ESEE DATABASE		 with coarse gravel wet Elastic Silt (MH) dark yellowish brown (10YR 4/4), yellow (10YR 7/6) and black (10YR 2/1) wet, medium stiff ¥ 	(Reco and 47	very=60% between 37	MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
Х9010Э9 45					M. M.



		Log upd Ground Top of P	ated with revised survey certified 3/23/2021 Surface Elevation (feet, NAVD88): 706.56 VC Casing Elevation (feet, NAVD188): 709.77	WELL: GWA-52 PAGE 1 OF 2
SOL SOL EAR	UTHERN COMPANY THERN COMPANY TH SCIENCE AND	Y SERVICES, INC ENVIRONMEN	LOG OF WELL CONSTRUCTION PROJECT Plant Bowen Cells 3 & 4 Wells CAL ENGINEERING LOCATION Cartersville, GA	<u>ECS37738</u>
DATE CONT	STARTED <u>4/7/2015</u> RACTOR Cascade D	COMPLET	ED _4/21/2015 SURF. ELEV706.56 COORDINATES:N 150	05459.85 E 2073876.0
	ED BY J. Sigler		Y <u>B. Smelser</u> CHECKED BY <u>L. Millet</u> ANGLE	BEARING
	S TOC Elevation 709	9.77, Sonic Drillir	g - 7"OD Casing in Overburden, 6"OD Core Well installed. Refer to well da	ita sheet.
		1		
		z	WELL DATA	
DEPTH (ft)	GROUNDWATER OBSERVATIONS	Cor Cor Pro	npletion: ective aluminum cover with bollards;	NOTES
		ш 4-fo	ot square concrete pad	
		706.56		
			;	
		703.56		
5				
10				
5 K 15				
20				
			Annular Fill: Portland Cement-Bentonite Grout (16 - 47lbs bags PC, 1 - 50lbs bags Gel, 100 gal. Water)	
25				
30			*	
- - 				
35				
40				
		(Continu	ed Next Page)	



CELLS 3 & 4	5.5.	Log updated with revised su Ground Surface Elevation (fe Top of PVC Casing Elevation	urvey certified 3/2 eet, NAVD88): 70 n (feet, NAVD188)	23/2021 6 .56 : 709.77	BOR	ING GWA-52
SC SC	CO	LOG OF	TEST BOR	ING		ECS37738
SOU EAF	UTHERN RTH SCIE	COMPANY SERVICES, INC. NCE AND ENVIRONMENTAL ENGINEERING	PROJECT Plant	Bowen Cells ersville, GA	3 & 4 Wells	
	STARTED RACTOR	0 <u>4/7/2015</u> COMPLETED <u>4/21/2015</u> SUF Cascade Drilling EQUIPMENT 7	RF. ELEV. 706.56 868 METHOD	COORE _Sonic	DINATES: N 1505459.85 E	2073876.0
	ED BY _J	. Sigler LOGGED BY B. Smelser		Aillet	ANGLE BE	ARING
	NG DEPTH S toce	I 80.96 ft. GROUND WATER DEPTH: DURING Elevation 709.77. Sonic Drilling - 7"OD Casing in Ove	6 <u>67 ft.</u> COM I rburden. 6"OD Core	P. <u>55.75 ft.</u> Well installed	DELAYED <u>56.79 ft. aft</u> d. Refer to well data sheet.	er 100 hrs.
						1
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	aak HCL derate REACTION ong	COMMENTS	Natural Gamma
		Silt (ML) - trace mottling red / moderate reddish brown (10F (7.5YR 5/4) fill moist, very stiff, interbedded clayer coarse to cobble/subrounded to rounded rock frag	R 4/6) and brown y zones, trace gments	<u>ਠੱਠੋਂ</u> Soil pene	density gauged by thumb etration	Wirth 5:
		Elastic Silt (MH) - mottled red (2.5YR 4/6) and brown (7.5YR 5/3) stiff to very stiff, low plastic, alternating interbedde trace coarse to very coarse/rounded to subrounde	residuum moist, ed zones of CL, ed rock fragments	-		MWW WWW WWWW
		Silt (ML) - dusky red / dark reddish brown (10R 3/4) residuu trace medium to coarse rock fragments - mottled dusky red (10R 3/3), red (10R 4/8) and light brown (5YR 6/4) residuum moist, very stiff, to coarse/angular to subangular rock fragments	um moist, very stiff, light reddish brown / race medium to			Man Man and Ang Maran Ang Ma
30 30		Elastic Silt (MH) - mottled dark red (10R 3/6), red (10R 5/6) and lig 6/4) residuum moist, very stiff to hard, low plastic trace zones of interbedded CL	ght brown (7.5YR , clayey silt with			MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
35 35 90 90 90 90 90 90 90 90 90 90 90 90 90		Lean Clay (CL) - mottled dark red (10R 3/6) and reddish yellow (residuum moist, very stiff, low to medium plastic, s gray with orangish brown stained/angular to subro friable to hard dolomite fragments	7.5YR 6/6) some white to light bunded/brittle to			Mr. M. Marna Mary



SOUTHEEN COMPANY SERVICES, INC. PROJECT Plant Bowen Cells 3 & 4 Wells LEARTH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA The second secon	s	DUTH		BORING GWA-52 PAGE 2 OF 2 ECS37738
Hard E Or Bool MATERIAL DESCRIPTION Notes that the second	SO EAI	UTHERN RTH SCI	I COMPANY SERVICES, INC. PROJECT <u>Plant Bo</u> ENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Carters</u>	owen Cells 3 & 4 Wells sville, GA
Lean Clay (CL) (Cont) - mottled reddish yellow (7.5YR 6/6) and red / moderate reddish brown (10R 4/6) residuum moist, stiff to very stiff, medium plastic, trace coarse to very coarse/rounded to subangular rock fragments 50 Sitt (ML) - brownish yellow / dark yellowish orange (10YR 6/6), very pale brown / very pale orange (10YR 8/2) and light red (2.5YR 6/6) residuum moist, stiff to very stiff, interbedded clay lenses, abundant light gray to white to light brown/coarse to very coarse/subrounded to angular dolomite and chert fragments - mottled reddish brown (5YR 4/3) and reddish brown (2.5YR 4/3) residuum wet, very stiff, trace very coarse/angular to subangular chert and dolomite fragments - trace mottled brownish yellow (10YR 6/8) and red (10R 5/8) residuum wet, medium stiff to stiff, trace interbedded clay, zone of fine to medium grained 5YR 6/8 reddish yellow SM @ approx. 70.5- 71 Lean Clay (CL) - red (10R 4/8) residuum wet, soft, low to medium plastic, some interbedded CH, trace zones of light gray angular dolomite fragments	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	COMMENTS Natural Gamma 110 110 110 110
 - mottled reddish brown (5YR 4/3) and reddish brown (2.5YR 4/3) residuum wet, very stiff, trace very coarse/angular to subangular chert and dolomite fragments ✓ - trace mottled brownish yellow (10YR 6/8) and red (10R 5/8) residuum wet, medium stiff to stiff, trace interbedded clay, zone of fine to medium grained 5YR 6/8 reddish yellow SM @ approx. 70.5-71' Lean Clay (CL) - red (10R 4/8) residuum wet, soft, low to medium plastic, some interbedded CH, trace zones of light gray angular dolomite fragments 	45 50 55 60		Lean Clay (CL) (Con't) - mottled reddish yellow (7.5YR 6/6) and red / moderate reddish brown (10R 4/6) residuum moist, stiff to very stiff, medium plastic, trace coarse to very coarse/rounded to subangular rock fragments Silt (ML) - brownish yellow / dark yellowish orange (10YR 6/6), very pale brown / very pale orange (10YR 8/2) and light red (2.5YR 6/6) residuum moist, stiff to very stiff, interbedded clay lenses, abundant light gray to white to light brown/coarse to very coarse/subrounded to angular dolomite and chert fragments Y	When why Man
interbedded CH, trace zones of light gray angular dolomite fragments	<u>65</u> 70		 mottled reddish brown (5YR 4/3) and reddish brown (2.5YR 4/3) residuum wet, very stiff, trace very coarse/angular to subangular chert and dolomite fragments ✓ - trace mottled brownish yellow (10YR 6/8) and red (10R 5/8) residuum wet, medium stiff to stiff, trace interbedded clay, zone of fine to medium grained 5YR 6/8 reddish yellow SM @ approx. 70.5-71' Lean Clay (CL) - red (10R 4/8) residuum wet, soft, low to medium plastic, some 	Marrian
Bottom of borehole at 81.0 feet.	75 80		- red (10K 4/8) residuum wet, sott, low to medium plastic, some interbedded CH, trace zones of light gray angular dolomite fragments Dolomite with Chert fragments Bottom of borehole at 81.0 feet.	

	•	Log upc Ground Top of F	ated with revised survey certified 3/23/2021 Surface Elevation (feet, NAVD88): 707.61 VC Casing Elevation (feet, NAVDI88): 710.99	WELL: GWA-53 PAGE 1 OF 4
SOU SOU EAR	DUTHERN A COMPAN UTHERN COMPANY RTH SCIENCE AND	SERVICES, INC ENVIRONMEN	LOG OF WELL CONSTRUCTION PROJECT Plant Bowen Cells 3 & 4 Wells Cal ENGINEERING LOCATION Cartersville, GA	<u>ECS37738</u>
	STARTED <u>3/26/2018</u>	5 COMPLE T	ED <u>4/10/2015</u> SURF. ELEV. <u>707.61</u> COORDINATES: <u>N 15</u> EQUIPMENT 7868 METHOD Sonic: SPT	505695.52 E 2074038.90
	ED BY J. Sigler		Y B. Smelser CHECKED BY L. Millet ANGLE	BEARING
BORI	NG DEPTH <u>117.85 ft.</u>		ATER DEPTH: DURING 53.5 ft. COMP. 56 ft. DELAYED	59.15 ft. after 100 hrs.
	S <u>TOC Elevation 71</u>	0.99, Sonic Drillii	g - 7"OD Casing in Overburden, 6"OD Casing in Rock, 4"OD Core Well ir	nstalled. Refer to well data sheet.
		_	WELL DATA	
TH (TION		
DEP (ft	OBSERVATIONS	K Cor U Pro	pletion: ective aluminum cover with bollards;	NOTES
		급 4-fc	ot square concrete pad	
		707.61		
		· · · · · · · · · · · · · · · · · · ·	Surface Seal: Concrete	
		704.61		
5				
10				
15				
			Annular Fill: Portland Cement-Bentonite Grout (39 - 47lbs bags	
2000 0			PC, 3 - SUIDS Dags Gel, 255 gal. Water)	
20				
<u>.</u>				
25				
- 				
30				
		(Continu	ed Next Page)	



(Continued Next Page)

SOUTHEEN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Plant Bowen Cells 3.8.4 Wells UCATION GROUNDWATER GENOMOWATER B VELL DATA Competion: Protective aluminum cover with bollards; 	so			LOG	OF WE	LL CONSTRUCTION	WELL: GWA-53 PAGE 3 OF 4 ECS37738
E GROUNDWATER OBSERVATIONS Image: Second Se	SOU EAR	THERN COMPANY TH SCIENCE AND	' SERVICES, IN Environmei	NC. NTAL ENGI	NEERING	PROJECT Plant Bowen Cells 3 & 4 Wells LOCATION Cartersville, GA	
E Completion: DBSERVATIONS E Completion: Protective aluminum cover with bollards; 4/ord square concrete pad NOTES 70	-		NO	WE	LL DATA		
70 75 75 80 80 80 81 82 83 85 90 90 90 90 90 90 91 92 93 94 95 95 96 97 98 99 90 90 91 92 93 94 95 96 97 98 99 90 91 92 93 94 95 96 97 98 99 90 91 92 93 94 95 95 96	DEPTH (ft)	GROUNDWATER OBSERVATIONS	ELEVATI BI ELEVATI FI A-	ompletion: rotective alur foot square (minum cover v concrete pad	vith bollards;	NOTES
0	70						
75 75 80 80 81 85 85 85 90 90 90 90 91 92 93 94 95 96 97 100							
80	75						
80 80 85 85 85 90 90 90 91 92 93 94 95 95 96 97 98 99 90 91 92 93 94 95 95 96 97 98 99 90 91 92 93 94 95 95 96 97 98 99 90 91 92 93 94 95 96 97 98 99 99 90 90 90 90							
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (105.5'-94.0')) and Baroid Hole Plug 3/8 Chips (13 - 50lbs bags (94.0-55.0')) 90 90 95 95	80			-			
85							
Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (105.5'-94.0')) and Baroid Hole Plug 3/8 Chips (13 - 50lbs bags (94.0'-55.0')) 90 90 90 90 90 90 90 90 90 90 90 90 90	85						
				ļ	Annular Seal: buckets (105.5 50lbs bags (94	Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal 5'-94.0')) and Baroid Hole Plug 3/8 Chips (13 - I.0'-55.0'))	
	90						
<u>95</u>							
	95						
	100						
	405		602 61				

SO		LOG OF WELL CONSTRUCTION	WELL: GWA-53 PAGE 4 OF 4 <u>ECS37738</u>
SOU EAR	TH SCIENCE AND	ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA	
DEPTH (ft)	GROUNDWATER OBSERVATIONS	WELL DATA OF Completion: Protective aluminum cover with bollards; 4-foot square concrete pad	NOTES
 		600.11 600.11 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.06 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00 500.00	
135			
140			

		Log updated with revised survey certified 3/2 Ground Surface Elevation (feet, NAVD88): 70 Top of PVC Casing Elevation (feet, NAVD188)	23/20 7.61 : 710	21 .99 BOR	NG GWA-53 PAGE 1 OF 4
SOU EAR	UTHERN RTH SCI	COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENGINEERING DOCATION Cart	Bower ersville	n Cells 3 & 4 Wells	<u>ECS37738</u>
DATE CONT DRILL BORIN	STARTE RACTOR ED BY _ NG DEPT	D 3/26/2015 COMPLETED 4/10/2015 SURF. ELEV. 707.61 Cascade Drilling EQUIPMENT 7868 METHOD J. Sigler LOGGED BY B. Smelser CHECKED BY L. N H 117.85 ft. GROUND WATER DEPTH: DURING 53.5 ft. COMI Elevation 710.99, Sonic Drilling - 7"OD Casing in Overburden, 6"OD Casing 6"OD Casing 6"OD Casing	<u>Soni</u> <u>Soni</u> <u>/illet</u> P. <u>56</u> ng in R	COORDINATES: N 1505695.52 E c; SPT	ARING er 100 hrs.
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Veak HCL Aoderate REACTION	COMMENTS	Natural Gamma
5		Silt (ML) - mottled red (10R 4/8) and yellowish red (5YR 5/8) fill dry, hard, some light gray to white/angular to subangular dolomite fragments		SPT N=42bpf(@3ft.) 12/18/24	MWWWW
10		- mottled red (10R 4/8) and yellowish red (5YR 5/8) fill dry, hard, trace white/medium to coarse/angular dolomite fragments		SPT N=32bpf(@8ft.) 7/15/17	4 Minur
15		- mottled yellowish red (5YR 5/8) and red (10R 4/8) residuum dry, very stiff, abundant white with orangish staining/coarse/angular to subangular dolomite fragments		SPT N=21bpf(@13ft.) 8/9/12	MM man m
20		Elastic Silt (MH) - mottled brownish yellow (10YR 6/8) and red (2.5YR 4/8) residuum dry, very stiff, low plastic, abundant coarse/angular to subangular/very brittle to friable dolomite fragments, trace light gray interbedded clay lenses		SPT N=19bpf(@18ft.) 6/9/10	Monnon
25		- mottled brownish yellow (10YR 6/8) and red / moderate reddish brown (10R 4/6) residuum moist, very stiff, low plastic, trace light gray angular dolomite and chert fragments		SPT N=20bpf(@23ft.) 6/6/14	Mar Mary Mary
30		Silt (ML) - trace mottling reddish yellow (7.5YR 7/8), reddish yellow (7.5YR 7/8) and brownish yellow (10YR 6/8) residuum moist, stiff, trace clay and rock fragments		SPT N=11bpf(@28ft.) 3/5/6	Mr. Maria



GEOLOGY LOG COLOR GAMMA - ESEE DATABASE. GDT - 5/20/15 13:24 - S:WORKGROUPSVAPC GENERAL SERVICE COMPLEXCIVIL TECH SUPPORTURILLINGIPROJECTS/BOWENICCB WELLS 2015/CELLS 3.4 WELLS/BOWENIC LOGS/PLANT BOWEN CELLS 3.8 4

LOG OF TEST BORING

BORING GWA-53 PAGE 2 OF 4 <u>ECS37738</u>

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERI

EAR	CI H SCI	ENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Cart</u>	ersvil	le, GA	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak HCL Moderate REACTION	COMMENTS	Natural Gamma
		Silt (ML) (Con't)			
35		Elastic Silt (MH) - trace mottling strong brown (7.5YR 5/8) and reddish yellow (7.5YR 7/8) residuum moist, very stiff, low plastic, abundant light gray/angular dolomite and dark bluish gray to brown chert fragments		SPT N=27bpf(@33ft.) 20/18/9	Mrshman
40		- mottled strong brown (7.5YR 5/8) and red / moderate reddish brown (10R 4/6) residuum moist, stiff, low plastic, trace dark gray to light gray/coarse/subangular chert and dolomite fragments		SPT N=13bpf(@38ft.) 10/4/9	MMMM -
45		Silt (ML) - mottled brown (7.5YR 4/4) and reddish yellow (7.5YR 6/6) residuum moist, stiff, abundant medium to coarse/subrounded dolomite fragments, trace dark gray/coarse/subangular to subrounded chert fragments		SPT N=14bpf(@43ft.) 8/6/8	MMMM
50		- reddish yellow (7.5YR 6/8) residuum moist, stiff, dark brown angular chert fragments, trace clay		SPT N=13bpf(@48ft.) 4/7/6	
55		 ✓ Elastic Silt (MH) mottled strong brown (7.5YR 5/8) and reddish yellow (7.5YR 7/8) residuum wet, very stiff, low plastic, subangular to subrounded chert and dolomite fragments 	_	SPT N=19bpf(@53ft.) 7/8/11	MMM MM
60		$\underline{\Psi}$ - yellowish red (5YR 5/8) residuum wet, soft, low plastic, cohesive, trace rock fragments		SPT N=2bpf(@58ft.) 1/1/1	
65		Lean Clay (CL) - yellowish red (5YR 5/8) residuum wet, very soft, low to medium plastic, trace rock fragments		SPT N=0bpf(@63ft.) WOH	mmmm



BORING	GWA-53
F	PAGE 3 OF 4
	ECS37738

BOWEN CELLS 3 &	DUTH		TEST BOR	ING	BORI	NG GWA-53 PAGE 3 OF 4 <u>ECS37738</u>
SOIS EAI	UTHERN RTH SCI	I COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENGINEERING	PROJECT Plant	Bower ersville	n Cells 3 & 4 Wells e, GA	
DEPTH (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Weak Moderate Strong	COMMENTS	Natural Gamma
VICCB WELLS 2015/CE		Lean Clay (CL) (Con't) - yellowish red / light brown (5YR 5/6) wet, very sof medium plastic, cohesive, abundant dark brown ch Dolostone - light gray (N7) and light bluish gray (10B 7/1) ve	t, low plastic to ert fragments ry fine to fine grain,		SPT N=0bpf(@68ft.) WOH	~ Mr. Mm
NG/PROJECTS/BOWE		medium hard to hard, slightly to moderately weather moderate- to high-angle fractures visible, moderate trace total and no healing visible, staining visible w approx. 71-72', core pieces stained from approx. 7 calcite fracture fill visible, trace dark brown interbed	ered, massive, e to partial healing, ithin fractures from 2-77.5', trace Ided chert		Degree of fracturing and fracture orientation unknown due to sonic drilling method	
EE DATABASE GDT - 5/20/15 13:24 - S.WORKGROUPSIAPC GENERAL SERVICE COMPLEXICIVIL TECH SUPPORTURILIN 6 6 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9		VOID - possible solution cavity (77.5-100') - approx. 8' of mud and rock fragments recovered, ledge @ approx. 89-90'	thin chert/dolomite			Samman Maran Ma
GEOLOGY LOG COLOR GAMMA - ESE 100 102 102		Dolostone - bluish gray (10B 5/1) very fine to fine grain, hard, weathered, massive, moderate- to high-angle fract low-angle fractures, moderate to full healing, no vis healed fractures, trace staining visible from approx few open fractures visible, calcite fracture fill visible thickness	not to slightly ures visible, trace ible staining within . 106-108', no to e approx. 1-2mm in			mmmmmWW



		Log upo Ground Top of I	lated with revised Surface Elevation VC Casing Elevati	survey certified 3/23/2021 (feet, NAVD88): 708.38 on (feet, NAVDI88): 711.58		WELL: GWA-53R
SC			LOG OF W	ELL CONSTRUCTIO	DN	ECS37738
EAR	THERN COMPANY	ENVICES, IN	 TAL ENGINEERING	LOCATION Cartersville, GA		
DATE	STARTED _3/30/2015	5 COMPLE	ED _4/10/2015 S	URF. ELEV. <u>708.38</u> COOF	RDINATES: N 150	5689.06 E 2074032.00
CONT	RACTOR Cascade E	Drilling	EQUIPMENT	7868 METHOD Sonic		
DRILL	ED BY J. Sigler		B. Smelser	CHECKED BY L. Millet	ANGLE	BEARING
BORIN	NG DEPTH <u>165.44 ft.</u>		WATER DEPTH: DURI	NG <u>55 ft.</u> COMP. <u>63.4 ft.</u>		9.81 ft. after 100 hrs.
NOTE	S TOC Elevation 71	<u>1.58, Sonic Drilli</u>	ng - 7"OD Casing in O	verburden, 6"OD Casing in Rock,	4"OD Core Well ins	talled. Refer to well data sheet.
		N	WELL DATA			
PTH ft)	GROUNDWATER	DITA Co	mpletion:			NOTES
DE	OBSERVATIONS		tective aluminum cove	er with bollards; id		
		708.38				
		·		al: Concrete		
		705.38				
5						
10						
15						
			Annular Fil	l [.] Portland Cement-Bentonite Grou	t (28 - 47lhs hads	
			PC, 2 - 50lb	os bags Gel, 120 gal. Water)		
20						
25						
30						
		(Contin	ued Next Page)			



SC		Ŷ	LC	G OF WELL CONSTRUCTION	WELL: GWA-53R PAGE 3 OF 5 <u>ECS37738</u>
SOU EAR	JTHERN COMPANY TH SCIENCE AND I	SERVICES, ENVIRONM	INC. ENTAL EI	PROJECT Plant Bowen Cells 3 & 4 Wells IGINEERING LOCATION Cartersville, GA	
H		NOI		WELL DATA	
DEP1 (ft)	OBSERVATIONS	ELEVAT	Completio Protective 4-foot squa	ı: aluminum cover with bollards; re concrete pad	NOTES
		(C)			
70					
75					
5					
80					
85				Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal buckets (153.0'-140.0')) and Baroid Hole Plug 3/8 Chips (13 - 50lbs bags (140 0'-52 0'))	
5					
90					
95					
100					

			LC	G OF WE	LL CONSTRUCTION	WELL: GWA-53R PAGE 4 OF 5 ECS37738
SOL FAR	JTHERN COMPANY	SERVICES,	INC. Entai fi	NGINFFRING	PROJECT Plant Bowen Cells 3 & 4 Wells	
		z		WELL DATA		
DEPTH (ft)	GROUNDWATER OBSERVATIONS	ELEVATIO	Completio Protective 4-foot squa	n: aluminum cover are concrete pad	with bollards;	NOTES
		<u>(C</u>	ONTINUED)	-		
105						
110						
115						
120				Annular Seal buckets (153.	: Pel-Plug 3/8 Bentonite Coated Pellets (3 - 5gal 0'-140.0')) and Baroid Hole Plug 3/8 Chips (13 -	
				50lbs bags (1	40.0'-52.0'))	
125						
1.0.0						
130						
135						



	Log updated with revised survey certified Ground Surface Elevation (feet, NAVD88 Top of PVC Casing Elevation (feet, NAVD	l 3/23/2 : 708.3 l88): 71	2021 8 1.58	BORI	NG GWA-53R
SOUTH	LOG OF TEST B	ORIN	G	• • • • • •	PAGE 1 OF 5 <u>ECS37738</u>
SOUTHERN EARTH SCI	N COMPANY SERVICES, INC. PROJECT	Cartersv	ille, GA	4 Wells	
ATE STARTE	D 3/30/2015 COMPLETED 4/10/2015 SURF. ELEV. 708 R Cascade Drilling EQUIPMENT 7868 MET	38 HOD _Sc	COORDIN	ATES: N 1505689.06	E 2074032.00
RILLED BY	J. Sigler LOGGED BY B. Smelser CHECKED BY 'H 165.44 ft. GROUND WATER DEPTH: DURING 55 ft. 0	L. Millet	63.4 ft.	ANGLE E	SEARING
OTES TOC	Elevation 711.58, Sonic Drilling - 7"OD Casing in Overburden, 6"OD	Casing ir	Rock, 4"OD	Core Well installed. Re	efer to well data she
(ft) (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION Veak	trong REACTION	COMMENTS	Natural Gamm
	Elastic Silt (MH) - dusky red (10R 3/3) fill dry, very stiff, trace organics and mediur coarse/subangular to subrounded rock fragments	n to	Soil der penetra	nsity gauged by thumb tion	
5	Silt (ML) - red / moderate reddish brown (10R 4/6) and red (10R 5/8) resid dry, very stiff, zone of brittle to friable light gray rock fragments @ approx. 6-7', trace clay	Jum			M
	- mottled yellowish red (5YR 5/8) and brownish yellow / dark yellowish orange (10YR 6/6) residuum dry, very stiff, medium to coarse/angular to subangular dolomite fragments, trace clay				hund
10	Elastic Silt (MH) - mottled strong brown (7.5YR 5/8) and red (10R 5/8) residuum of very stiff to hard, low plastic, interbedded sandy CL, zone of decreased clay to silt and rock fragments @ approx. 13-14', abundant very coarse/subangular/light gray dolomite fragments	lry,			MMMMM
<u>15</u>	mattled raddish vallour (7 SVR 6/6) and rad (madarate raddish				
 20	brown (10R 4/6) residuum dry, very stiff, low plastic, abundant ligh gray to white/very coarse to cobble/angular to subangular dolomit fragments, light gray to brown chert fragments	it Ə			ALX MAN
·····					VILY MAN
 25					Murin
30	Silt (ML) - mottled strong brown (7.5YR 5/6), pink (7.5YR 7/4) and red (2. 5/8) residuum moist, stiff, interbedded zones of ML, abundant lig gray to white/medium to coarse dolomite and chert fragments, rul zone of very coarse to cobble size @ approx. 35-36'	5YR ht ble			Mymm



BORING	GWA-53R
	PAGE 2 OF 5
	ECS37738

so	DUTH	LOG OF TEST BOR	ING	BOR	ING GWA-53R PAGE 2 OF 5 ECS37738	
SOU EAR	UTHERI TH SCI	N COMPANY SERVICES, INC. PROJECT <u>Plant</u> ENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Cart</u>	Bowen Cell ersville, GA	ls 3 & 4 Wells		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate Strong	COMMENTS	Natural Gamma	
35 40 45 50 55		 Silt (ML) (Cont) - trace mottling strong brown (7.5YR 5/6) and red (2.5YR 4/8) residuum moist, stiff, decrease in rock fragments from above, light gray/coarse to very coarse/angular to subangular dolomite fragments, trace chert fragments - trace mottling strong brown (7.5YR 5/6) and red (10R 5/8) residuum moist to wet, stiff, abundant coarse/angular to subangular dolomite and chert fragments, rock lens/ledge of dolomite with trace chert @ approx. 54-55' with coarse to large cobble size pieces recovered, trace interbedded clay lenses ✓ Lean Clay (CL) ✓ - reddish brown (2.5YR 4/3) residuum wet, soft, low to medium plastic, cohesive, trace coarse/angular to subangular dolomite and 			MANAMANAMANAMANA MANAMANANA MANAMANANA MANAMANA	
<u>60</u> <u>65</u>		∡			Mummeruran	
						0.0000
---------------	--------------------	--------------------------------------------------------------	------------------------	-----------------------------	--------------------------------------------------------	-----------------------------------------------------------
so	DUTH		TEST BOF	RING	BORIN	G GWA-53R PAGE 3 OF 5 <u>ECS37738</u>
SOU EAF	UTHERN RTH SCIE	COMPANY SERVICES, INC. CNCE AND ENVIRONMENTAL ENGINEERING	PROJECT Plant	<u>t Bower</u> tersville	n Cells 3 & 4 Wells	
]
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	rate HCL B	COMMENTS	Natural Gamma
			ш	Weak Mode Stron		55 110 165
		Lean Clay (CL) (Con't)				
		- No Recovery (67-77')				$\left \begin{array}{c} \\ \end{array} \right $
						$\left \right\rangle$
70						
						\mathbb{N}
						\sim
						\leq
75						$\left \right\rangle$
						1
						$\left\{ \begin{array}{c} \\ \\ \\ \end{array} \right\}$
		Silt (ML)	ud filled void limited			ξ.
		recovery, abundant coarse to very coarse dolomit	te and chert			< L
80		fragments, cohesive				5
						~
						3
85						$\left \right\rangle$
						<i>∽</i>
5						$\left \right\rangle$
						3
						\sim
90					Limited Descurrent	≶
		Dolostone			Limitea Recovery	
		VOID - possible solution cavity (91-95')				$\sum_{i=1}^{n}$
						$\left \begin{array}{c} \\ \\ \\ \\ \end{array} \right $
95						}
		Dolostone with interbedded Chert	ne to fine grain		Degree of freaturing and freature	Z
		medium hard, moderately weathered, massive, tr	ace apparent high-		orientation unknown due to	Ę
		light brown to orangish-brown mud staining, dark	gray to dark brown		sonic drilling method, no intact core pieces recovered	2
		cnert, chert decreasing with depth				5
100						$\left \right\rangle$
		VOID - possible solution cavity (100-104')				



	UTH	LOG OF TEST BO	RIN	G	BOR	ING GWA-53 PAGE 5 OF ECS377	3R F 5 '38
SOL	CC UTHERN	COMPANY SERVICES, INC. PROJECT <u>PI</u>	ant Bow	ven	Cells 3 & 4 Wells		
EAR	TH SCIE	ENCE AND ENVIRONMENTAL ENGINEERING LOCATION	artersvi	ille,	GA		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	eak oderate DT ACTION	rong REACTION	COMMENTS	Natural Gam	ıma S9
		VOID - possible solution cavity (130-143') (Con't)	<u>××</u>	St		1	-
140						\mathbb{A}	
						W	-
						\mathbb{N}	
		Delectore				$\left \right\rangle$	
		- light gray (N7) and light bluish gray (10B 7/1) very fine to fine gra	in,		No intact recovery		
145	 	low-angle to horizontal fractures with no to partial healing, trace				~~~	
		healing, trace brown staining within some partially healed fractures				Ę	
		VOID - possible solution cavity (147-153')				Ę	
		- no recovery					
150						Ş	
						\leq	
			-			\leq	:
		Dolostone with trace interbedded Chert nodules				Ş	
155		 light gray (N7) and bluish gray (10B 5/1) very fine to medium gra massive, mostly small pieces and fragments recovered, trace 	in,		No intact recovery	<u>S</u>	:
		samples show fracture orientation, low- to high-angle fractures, no moderate healing, trace fully healed fractures, calcite fracture fill				<pre>}</pre>	
		visible, dark brown to red staining visible within some fractures, sm. 1-2mm thick fill, zone of thick 6-8mm thick moderately to fully heale	all ed			\sim	
		fractures with large calcile crystals visible @ approx. 164				3	
160							
••••••							
							-
165							-
		Bottom of borehole at 165.4 feet.	:				
170							
							-

DUTTHER COMPANY SERVICES, INC. PROJECT_Plant Bowen Cells 3.8.4 Wells DATE STARTED_3252015	SOUTH		Log updated with revised survey of Ground Surface Elevation (feet, NA Top of PVC Casing Elevation (feet, LOG OF WELL O	ertified 3/23/2021 AVD88): 701.23 NAVDI88): 704.23]	WELL: GWA-54 PAGE 1 OF 2 <u>ECS37738</u>
CONTRACTOR Cascade Drilling EQUIPMENT 7868 METHOD Sonic DRILLED BY J. Sigler LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE BEARING DORING DEPTH 73.17 ft GROUND WATER DEPTH: DURING 58 ft COMP. 55 ft DELAYED 51.05 ft. after 100 hts. NOTES TOC Elevation 704.23. Sonic Drilling - 7'OD Casing in Overburden. 6'OD Casing in Rock. 4'OD Core Well installed. Refer to well date E GROUNDWATER VELL DATA U Completion: Protective aluminum cover with bollards; 4. Tot Square concrete pad NOTES 701.23 (y) 10 (y) Surface Seal: Concrete	SOUTHERN EARTH SCIE	COMPANY SER ENCE AND ENVI D _3/25/2015	VICES, INC. PRO RONMENTAL ENGINEERING LOO COMPLETED <u>4/14/2015</u> SURF. ELE	DJECT Plant Bowen Cells 3 CATION Cartersville, GA	& 4 Wells	5853.39 E 2074286.28
BORING DEPTH 73.17 ft. GROUND WATER DEPTH: DURING § 56 ft. DELAYED 51.05 ft. after 100 hrs. NOTES TOC Elevation 704.23. Sonic Drilling - 7*0D Casing in Overburden. 6*0D Casing in Rock. 4*0D Core Well installed. Refer to well data #age GROUNDWATER g WELL DATA NOTES TOC Elevation 704.23. Sonic Drilling - 7*0D Casing in Overburden. 6*0D Casing in Rock. 4*0D Core Well installed. Refer to well data #age GROUNDWATER g WELL DATA Profective alumnium cover with bollards; Profective alumnium cover with bollards; NOTES 5		Cascade Drilling	EQUIPMENT 7868	METHOD KED BY Millet		BEARING
NOTES TOC Elevation 704.23, Sonic Drilling - 7"OD Casing in Overburden, 6"OD Casing in Rock, 4"OD Core Well installed. Refer to well data		H _73.17 ft.	GROUND WATER DEPTH: DURING 58 ft	COMP. <u>55 ft.</u>	DELAYED5	51.05 ft. after 100 hrs.
Production: Completion: Protective aluminum cover with bollards; 4-foot square concrete pad NOTES 701.23 10 5 10 10 10 12 10 13 10 20 20 21 21 22 23	NOTES TOCI	Elevation 704.23,	Sonic Drilling - 7"OD Casing in Overburder	n, 6"OD Casing in Rock, 4"O	D Core Well ins	talled. Refer to well data sheet.
Image: BrownowATER OBSERVATIONS Image: Completion: Protective aluminum cover with bollards; 4-foot square concrete pad NOTES Image: Distribution of the square concrete pad Image: Total square concrete pad NOTES Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concrete pad Image: Total square concrete pad Image: Total square concrete pad Image: Distribution of the square concre		_	WELL DATA			
701.23 10 5 10 10 10 15 15 20 25	H (€) GROUN OBSEF	NDWATER	Completion: Protective aluminum cover with bol 4-foot square concrete pad	lards;		NOTES
698.23 9 5 9 10 9 10 9 10 9 11 9 15 9 15 9 20 9 20 9 20 9 20 9 20 9 20 9 20 9 20 9 21 9 22 9 23 9		701	.23			
5 10 11 10 11 12 20 20 20 21 22 23 25			Surface Seal: Concr	ete		
5 10 10 11 10 10 10 11 11 12 20 20 20 20 20 20 20 20 20 21 22		698				
10 10 15 20 20 25 Annular Fill: Portland Cement-Bentonite Grout (20 - 47lbs bags PC, 2.25 - 50lbs bags Gel, 120 gal. Water)	5					
10 10 11 12 15 15 20 20 20 20 20 20 20 20 20 20 20 20 21 22						
10 15 20 20 21 22 23						
15 20 20 20 20 21 22 23	10					
15 20 20 20 20 21 22 25						
15 20 20 20 20 20 20 21						
20 20 20 20 20 20 20 20 20 20	15					
20 20 20 20 20 20 21 22 23						
20 Annular Fill: Portland Cement-Bentonite Grout (20 - 47lbs bags PC, 2.25 - 50lbs bags Gel, 120 gal. Water) 25 25						
20 Annular Fill: Portland Cement-Bentonite Grout (20 - 47lbs bags PC, 2.25 - 50lbs bags Gel, 120 gal. Water) 25 25						
25	20		Annular Fill: Portland PC, 2.25 - 50lbs bags	l Cement-Bentonite Grout (20 s Gel, 120 gal. Water)) - 47lbs bags	
	25					
	30					
	35					



		Log updated with revised survey certified 3/ Ground Surface Elevation (feet, NAVD88): 70 Top of PVC Casing Elevation (feet, NAVD188)	23/20) 1.23 : 704)21 . 23	BOR		GV	VA	-54
SC	OUTH	LOG OF TEST BOR	RING	G		F	'AGE EC	E 1 C S37	DF 2 7 <u>738</u>
SOU EAR	JTHERN TH SCII	A COMPANY SERVICES, INC. PROJECT <u>Plan</u> ENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Car</u>	t Bowe tersvill	en Cells 3 8 le, GA	& 4 Wells				
DATE	STARTE	D 3/25/2015 COMPLETED 4/14/2015 SURE FLEV 701.23		COORDIN	ATES: N 1505853 39	F 2074	286	28	
CONT	RACTOR	Cascade Drilling EQUIPMENT 7868 METHOD	Sor	nic	<u> </u>				
BORIN	.ed by _ Ng dept	J. Sigler LOGGED BY B. Smelser CHECKED BY L. 'H 73.17 ft. GROUND WATER DEPTH: DURING 58 ft. COM	Millet I P. <u>5</u>5	5 ft.	_ ANGLE B _ DELAYED <u>_51.05 ft.</u> af	EARINO	3		
NOTE	S <u>TOC</u>	Elevation 704.23, Sonic Drilling - 7"OD Casing in Overburden, 6"OD Cas	ing in l	Rock, 4"O[D Core Well installed. Re	fer to w	<u>ell d</u>	ata :	sheet.
	U	Z	CL STON						
DEPTH (ft)	RAPHI LOG	MATERIAL DESCRIPTION	REAC		COMMENTS	Na	itural	Ga	mma
	Ū		Weak Moderate	Buone		L	6 0	110	165
		Silt (ML) - red / moderate reddish brown (10R 4/6) fill moist, hard, trace organics and interbedded clay lenses		Soil de penetra	nsity gauged by thumb ation				
		- dark red (10R 3/6) and dusky red / dark reddish brown (10R 3/4) residuum moist, very stiff, white to light gray/medium to							
5		coarse/angular rock fragments, trace clay							
10		moist, very stiff, white to light gray/coarse to cobble/angular to subangular dolomite fragments, amount and size of rock fragments							
) 		increases with depth, trace interbedded clay lenses							
15									
)									
		Elastic Silt (MH) - mottled reddish yellow (5YR 6/8) and red (10R 4/8) residuum dry,							
20		very stiff, low plastic, abundant light gray to white/angular to subrounded rock fragments, clay content increasing with depth							
25									
) 									
		- trace mottling strong brown (7.5YR 5/6) and red (10R 5/8)							
30		residuum moist, stiff to very stiff, low plastic, interbedded CL, decrease in amount of dolomite fragments, increase in size of dolomite fragments, trace dark gray angular chert fragments					•		
							•		
35									
							:	:	:





sc	DUTH	LOG OF TEST BORING	BORING GWA-54 PAGE 2 OF 2 <u>ECS37738</u>
SOU Ear	JTHERN TH SCII	I COMPANY SERVICES, INC. PROJECT Plant Bowen Cells 3 & 4 W ENCE AND ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA	/ells
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DMMENTS Natural Gamma
40		Elastic Silt (MH) (Con't) - strong brown (7.5YR 5/6) residuum moist, very stiff, low plastic, interbedded CL, light gray/cobble/angular to subangular dolomite and chert fragments	
_45 _50		Sandy Lean Clay (CL) - trace mottling red (2.5YR 5/8), red (10R 4/8) and light brown (7.5YR 6/4) residuum moist to wet, stiff, medium to high plastic, interbedded pockets of very fine grained non plastic silt (7.5YR 6/4) and trace interbedded CH, coarse to cobble/angular to rounded abundant dolomite and trace chert fragments <u>Y</u>	
55 60		✓ - yellowish red (5YR 4/6) residuum wet, stiff, medium plastic, abundant medium to coarse/angular dolomite and chert fragments, soft zone with slight decrease in clay @ approx. 61-62', trace interbedded CH	
 70		- yellowish red (5YR 4/6) residuum wet, soft to very soft, medium plastic, coarse to cobble size chert fragments, thin zone of light gray to medium gray silty sand (>1' thick) @ approx. 72.5'	
75		Bottom of borehole at 73.2 feet.	
80			

-L03 & 4 WEI		Log upd Ground Top of P	ated with revised survey certified 3/23/2021 Surface Elevation (feet, NAVD88): 693.43 /C Casing Elevation (feet, NAVD188): 696.72	WELL: GWA-55
SOU SOU EAF	UTHERN COMPANY COMPANY TH SCIENCE AND	X SERVICES, IN ENVIRONMEN	LOG OF WELL CONSTRUCTION PROJECT Plant Bowen Cells 3 & 4 Wells CAL ENGINEERING LOCATION	<u>ECS37738</u>
	STARTED _3/18/2019 RACTOR _Cascade E LED BY _J. Sigler	5 COMPLET	ED _4/15/2015 SURF. ELEV693.43 COORDINATES: _N < EQUIPMENT _7868 METHOD _Sonic Y _B. Smelser CHECKED BY _L. Millet ANGLE	1506034.69 E 2074507.04
	NG DEPTH _62.42 ft.	GROUND V 6.72, Sonic Drillin	ATER DEPTH: DURING 40.5 ft. COMP. 42.8 ft. DELAYE g - 6"OD Casing, 4"OD Core Well installed. Refer to well data sheet.	D 43.59 ft. after 100 hrs.
DEPTH (ft)	GROUNDWATER OBSERVATIONS	NOLLA Cor BLATION BLATENAL	WELL DATA npletion: ective aluminum cover with bollards; ot square concrete pad	NOTES
		693.43 5 · · · · · · · · · · · · · · · · · ·	Surface Seal: Concrete	
5		691.43:		
200292000 			Annular Fill: Portland Cement-Bentonite Grout (26 - 47lbs ba PC, 2.5 - 50lbs bags Gel, 150 gal. Water)	gs
20				
25		Contin	ed Next Page)	



BOULDOWNATER COUNDWATER Barris GENERATION WELL DATA Barris GENERATION Generative aluminam cover with bolands, theorem and the same data with output to the same data with output to the same data with output to the same data with bolands, the same data with output to the same data with output				WELL: GWA-55 PAGE 3 OF 3 ECS37738
AKITI SLENCE AND ENVIRONMENTAL ENVIRONMEN	SOL	UTHERN COMPANY	SERVICES, INC. PROJECT Plant Bowen Cells 3 & 4 Wells	
Head Completion: Protective aluminum cover with bollards; 4-lot square concrete pad NOTES 00 Standpipe: 2" OD PV0 (SC)+ 40) Screen: 10 ft; 0.010" Slot Prepack 0 00 522.31 Screen: 10 ft; 0.010" Slot Prepack 01 522.31 Screen: 10 ft; 0.010" Slot Prepack 02 522.31 Screen: 10 ft; 0.010" Slot Prepack 03 522.31 Screen: 10 ft; 0.010" Slot Prepack 04 522.31 Screen: 10 ft; 0.010" Slot Prepack 05 522.31 Screen: 10 ft; 0.010" Slot Prepack 05 522.31 Screen: 10 ft; 0.010" Slot Prepack 06 522.31 Screen: 10 ft; 0.010" Slot Prepack 07 531.41 Screen: 10 ft; 0.010" Slot Prepack 08 522.31 Screen: 10 ft; 0.010" Slot Prepack 09 522.31 Screen: 10 ft; 0.010" Slot Prepack	EAR	TH SCIENCE AND	ENVIRONMENTAL ENGINEERING LOCATION Cartersville, GA	
B Comparison: NOTES Protective aluminum cover with bollards: NOTES NOTES Standpipe: 2" OD PVC (SCH 40) Scener: 10 ft; 0.010" Stol Prepack Scener: 10 ft; 0.010" Stol Prepack 60 Standpipe: 2" OD PVC (SCH 40) 70 Standpipe: 2" OD PVC (SCH 40) 71 Standpipe: 2" OD PVC (SCH 40) 72 Standpipe: 2" OD PVC (SCH 40) 73 Standpipe: 2" OD PVC (SCH 40) 74 Standpipe: 2" OD PVC (SCH 40) 75 Standpipe: 2" OD PVC (SCH 40) 76 Standpipe: 2" OD PVC (SCH 40) 77 Standpipe: 2" OD PVC (SCH 40) 78 Standpipe: 2" OD PVC (SCH 40) 79 Standpipe: 2" OD PVC (SCH 40) 76 Standpipe: 2" OD PVC (SCH 40) 77 Standpipe: 2" OD PVC (SCH 40) 78 Standpipe: 2" OD PVC (SCH 40) 79 Standpipe: 2" OD PVC (SCH 40) 79 Standpipe: 2" OD PVC (SCH 40) 79 Standpipe: 2" OD PVC (SCH 40) 70 Standpipe: 2" OD PVC (SCH 40) 71 Standpipe: 2" OD PVC (SCH 40) 72 Standpipe: 2" OD PVC (SCH 40)	т		WELL DATA	
80 Strandpipe: 2" OD PVC (SCH 40) 80 Screen: 10 ft; 0.010" Soil Prepack 63 Sump: 0.30 ft; 65 Sump: 0.30 ft; 70 Sump: 0.30 ft; 70 Sump: 0.30 ft; 80 Sump: 0.30 ft; 81 Sump: 0.30 ft; 83 Sump: 0.30 ft; 84 Sump: 0.30 ft; 85 Sump: 0.30 ft; 86 Sump: 0.30 ft; 87 Sump: 0.30 ft; 88 Sump: 0.30 ft; 89 Sump: 0.30 ft; 80 Sump: 0.30 ft; 81 Sump: 0.30 ft; 82 Sump: 0.30 ft; 83 Sump: 0.30 ft; 84 Sump: 0.30 ft; 85 Sump: 0.30 ft; 86 Sump: 0.30 ft;	DEPT (ft)	GROUNDWATER OBSERVATIONS	Completion: Protective aluminum cover with bollards; 4-foot square concrete pad	NOTES
80 Streep: 0.30 ft. 60 Streep: 0.30 ft. 63 Streep: 0.30 ft. 64 Streep: 0.30 ft. 70 Streep: 0.30 ft. 70 Streep: 0.30 ft. 80 Streep: 0.30 ft. 80 Streep: 0.30 ft.				
80 932.33 Screen: 10 ft; 0.010* Slot Prepack 80 932.31 Screen: 10 ft; 0.010* Slot Prepack 65 Screen: 10 ft; 0.010* Slot Prepack 70 Screen: 10 ft; 0.010* Slot Prepack 80 Screen: 10 ft; 0.010* Slot Prepack				
80 Screen: 10 ft; 0.010* Slot Prepack 60 G32.23 G32.23 Sump: 0.30 ft G5 G31.01 65 G31.01 70 G31.01 71 G31.01 72 G31.01 73 G31.01 74 G31.01 75 G31.01 76 G31.01 77 G31.01 78 G31.01 79 G31.01 70 G31.01 71 G31.01 72 G31.01 73 G31.01 74 G31.01 75 G31.01 76 G31.01 77 G31.01 78 G31.01 79 G31.01 70 G31.01 71 G31.01 72 G31.01 73 G31.01 74 G31.01 75 G31.01 76 G31.01 77 G31.01 77 G31.01				
80 32.3 Source in to 82.42 ft.			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack	
65 70 75 80	60			
80 80				
051.01 Cave-in to 62.42 ft. 65			632.31	
			Cave-in to 62.42 ft.	
	65			
75 80	70			
75 80 80				
75 80 80				
75 80 80				
80	75			
80				
80				
80				
ο _Ε	80			
ос.				
ос.				
0E				
	<u>85</u>			

24	5. D	Log updated with revised s Ground Surface Elevation (Top of PVC Casing Elevatio	survey certified 3/2 feet, NAVD88): 69 on (feet, NAVD188)	23/2021 3.43 : 696.72	ВС	DRING GWA-55
SOL	UTHERN	ERNAR DMPANY SERVICES, INC.	F TEST BOR	RING	3 & 4 Wells	<u>ECS37738</u>
EAR	TH SCI	ENCE AND ENVIRONMENTAL ENGINEERING	LOCATION Car	ersville, GA		
DATE	STARTE	D <u>3/18/2015</u> COMPLETED <u>4/15/2015</u> SU	JRF. ELEV. <u>693.43</u>	COORD	INATES: N 1506034.6	69 E 2074507.04
DRILL	RACTOR	Logged BY	<u>7868</u> METHOD CHECKED BY _L.	Sonic Villet	ANGLE	BEARING
BORIN		H <u>62.42 ft.</u> GROUND WATER DEPTH: DURIN	IG <u>40.5 ft.</u> COM	P. <u>42.8 ft.</u>	DELAYED 43.59 ft	. after 100 hrs.
NOTE	s <u>toc</u>	Elevation 696.72, Sonic Drilling - 6"OD Casing, 4"Ol	D Core Well installed.	Refer to well d	ata sheet.	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	aak HCL bderate REACTION ong	COMMENTS	Natural Gamma
		Silt (ML) - mottled red / moderate reddish brown (10R 4/6 gray (10R 3/1) fill dry, hard, trace organics, clay, coarse/angular to subangular rock fragments	i) and dark reddish and medium to	Str. Mc		
5		 dusky red / dark reddish brown (10R 3/4) and residuum dry, very stiff, increase in rock fragmen to light gray with brown staining/angular to subar fragments, trace interbedded CL 	weak red (10R 4/4) nts with depth, white ngular dolomite			~~~~~W
		- increase in size of rock fragments, very coarse	to cobble size			WWW/
10		- mottled red (10R 4/8) and reddish yellow (5Yf very stiff, abundant white to pinkish white/coarse coarse/angular to subangular dolomite fragment	R 6/8) residuum dry, a to very s			M ~~~ M
15						M. M. M.
-						- WWW
_20		Elastic Silt (MH) - trace mottling strong brown (7.5YR 5/8) and r residuum dry, very stiff, low plastic, red mottling depth, zones of mostly weathered rock fragment 23.5', abundant white to light gray/angular to su fragments	ed (2.5YR 4/8) decreasing with ts @ approx. 21' and bangular dolomite			WWWWWWWWWWWWWWWWW
25						M M



BORING	GWA-55
1	PAGE 2 OF 3
	ECS37738

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Plant Bowen Cells 3 & 4 Wells

EAF	RTH SCI	ENCE AND ENVIRONMENTAL ENGINEERING LOCATION Ca	tersville	e, GA	
	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate Strong	COMMENTS	Natural Gamma
		Elastic Silt (MH) (Con't) - mottled dark reddish brown (2.5YR 3/4) and yellowish red (5YR 5/8) residuum moist, very stiff, low plastic, interbedded CL lenses, decrease in dolomite fragments, increase in light to dark brown/angular chert fragments			WWWWWWWWWWWWWWW
		Lean Clay (CL) - yellowish red (5YR 4/6) residuum moist, very stiff, low to medium plastic, interbedded silt lenses, dark to light brown/angular chert fragments, trace dolomite fragments, zone of interbedded 10YR 8/8 yellow silt @ approx. 36-36.5'	-		MMM MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
45 50 50		 Dolostone with trace chert light bluish gray (10B 7/1) and bluish gray (10B 5/1) very fine to medium grain, medium hard, moderately weathered, massive, visible fully healed fractures with calcite fracture fill, high-angle (vertical) fractures with trace low-angle fractures, some samples show bisecting healed fractures, fractures range from 1-2mm to few 4-6mm, some partially healed fractures observed VOID - possible solution cavity (48'-52') 		Degree of fracturing and fracture orientation unknown due to sonic drilling method, no intact core pieces recovered	Maryman
55		Dolostone - light gray (N7) and light bluish gray (10B 7/1) very fine to fine grain medium hard, moderately to highly weathered, moderate- to high- angle fractures, partial to full healing visible, calcite fracture fill visible healed fractures range from 1-2mm to 3-4mm thick, trace very coarse calcite crystals visible @ 53' within heavily fractured zone, driller	,		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

SVPLANT BOWEN CELLS 3 & 4

S	DUTH		TEST BOI	RING	В	ORING	GW/ AGE 3 ECS:	A-55 OF 3 37738
. 8	C	DMPANY						
SO EAI	UTHERN RTH SCIE	COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENGINEERING	LOCATION Ca	<u>nt Bowen Cel</u> irtersville, GA				
				NO				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	erate REACT	COMMENTS	Na	tural G	amma
		noted a thin open section @ 58-58 5'		Wea Mode Stror		2	3 1	165
		Dolostone (Con ^t)					• • •	
							• • •	-
60								
		Bottom of borehole at 62.4 fee	t.					
65	_							
70	-							
								-
/5	-							
80								
00	-						-	
								-
0.5								

		Log upd Ground S Top of P	ated w Surfac VC Ca	vith revised survey certified 3/23/2021 e Elevation (feet, NAVD88): 693.28 sing Elevation (feet, NAVD188): 696.53	WELL: GWA-55R
	UTHERN COMPANY	SERVICES INC	LO	G OF WELL CONSTRUCTION PROJECT Plant Bowen Cells 3 & 4	Wells
	STARTED 2/11/2015		TAL EN	IGINEERING LOCATION Cartersville, GA	
	RACTOR Cascade D		ED <u>4/</u>	EQUIPMENT 7868 METHOD Sonic; SPT	ES: <u>N 1506034.09 E 2014501.04</u>
	ED BY J. Sigler		BY <u>B.S</u>	Smelser CHECKED BY L. Millet A	NGLE BEARING
	S TOC Elevation 696	6.53, Sonic Drillin	ng - 6"C	D Casing, 4"OD Core Well installed. Refer to well data sl	heet.
				-	
		NO	,	NELL DATA	
EPTI	GROUNDWATER OBSERVATIONS	LE Cor	npletior	: Juminum cover with hollorde:	NOTES
			ot squa	re concrete pad	
		693.28	5.		
		691.28	5///	- Surrace Seal: Concrete	
5					
10					
ALCE					
i i i i i i i i i i i i i i i i i i i					
20				Annular Fill: Portland Cement-Bentonite Grout (40 - 4	7lbs bags
				PC, 4.5 - 50lbs bags Gel, 205 gal. Water)	
0					
CLO					
25				-	
ASE.G					
DALAB					
30					
2 35					
۲ ۲					
÷۱					I





2.1	5. 5.	Log updated with revised survey certified 3/2 Ground Surface Elevation (feet, NAVD88): 69 Top of PVC Casing Elevation (feet, NAVDI88):	3/202 3.28 696.	21 53 BORIN	IG GWA-55R
SOU EAR	UTHERN TH SCIE	COMPANY SERVICES, INC. NCE AND ENVIRONMENTAL ENGINEERING	Bower ersville	n Cells 3 & 4 Wells , GA	ECS37738
DATE CONT DRILL BORIN NOTE	STARTEI RACTOR ED BY IG DEPTH S _TOC F	0 3/11/2015 COMPLETED 4/15/2015 SURF. ELEV. 693.28 Cascade Drilling EQUIPMENT 7868 METHOD J. Sigler LOGGED BY B. Smelser CHECKED BY L. M I 102.83 ft. GROUND WATER DEPTH: DURING 38.5 ft. COMI Elevation 696.53, Sonic Drilling - 6"OD Casing, 4"OD Core Well installed. Installed.	<u>Sonio</u> <u>Sonio</u> <u>Aillet</u> P. <u>41.</u> Refer to	COORDINATES: N 1506034.69 E c; SPT	E 2074507.04
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Neak HCL Moderate REACTION Strong	COMMENTS	Natural Gamma
5		Silt (ML) - red / moderate reddish brown (10R 4/6) residuum moist, very stiff, trace clay and subrounded coarse sand		SPT N=26bpf(@3ft.) 6/10/16	- Nurraw Marine
10		- mottled red (10R 5/8) and reddish yellow (5YR 6/8) residuum dry, hard, trace clay and subrounded coarse sand		SPT N=34bpf(@8ft.) 8/14/20	Mundar
15		- mottled strong brown (7.5YR 5/8), light gray (10YR 7/1) and red (10R 5/6) residuum dry, hard, increase in clay content within mottled zones, trace white to light gray/angular rock fragments		SPT N=33bpf(@13ft.) 10/14/19	MANN MANN
_20		- mottled red (2.5YR 4/6) and reddish yellow (7.5YR 6/8) residuum dry, hard, light gray angular chert fragments		SPT N=41bpf(@18ft.) 12/24/17	M M M
_25		Elastic Silt (MH) - mottled red (2.5YR 4/6) and reddish yellow (7.5YR 6/8) residuum moist, very stiff, low plastic, light gray with yellowish staining/angular rock fragments		SPT N=24bpf(@23ft.) 7/10/14	
30		- mottled red (2.5YR 4/6) and reddish yellow (7.5YR 6/8) residuum moist, very stiff, low plastic, light gray/coarse/angular to subangular chert and dolomite fragments		SPT N=24bpf(@28ft.) 7/9/15	Why man
35		Lean Clay (CL) - mottled reddish yellow (5YR 6/8) and red (10R 5/8) residuum moist, very stiff, low to medium plastic, gray angular to subrounded chert fragments		SPT N=22bpf(@33ft.) 4/13/9	W/WWW

se	DUTH		ST BOR	RING	BORIN	G GWA-55R PAGE 2 OF 3 ECS37738
SO	UTHERI	N COMPANY SERVICES, INC.	OJECT Plant	Bower	Cells 3 & 4 Wells	
EAI	RTH SCI	ENCE AND ENVIRONMENTAL ENGINEERING LO	CATION Carl	tersville	, GA	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Veak 1 oderate trong	COMMENTS	Natural Gamma
40		Lean Clay (CL) (Con't)	o medium		SPT N=16bpf(@38ft.) 5/7/9	
45		▼ Fat Clay (CH) yellowish red (5YR 5/8) residuum wet, very stiff, media plastic, trace light gray rock fragments 	um to high	_	SPT N=17bpf(@43ft.) 7/9/8	When when when when when when when when w
50		Dolostone - light bluish gray (10B 7/1) and bluish gray (10B 5/1) v fine grain, medium hard, slightly to moderately weathere visible high-angle fractures with calcite fracture fill, full h chert VOID - possible solution cavity (53'-58')	ery fine to cd, some ealing, trace		Degree of fracturing and fracture orientation unknown due to sonic drilling method, no intact core pieces recovered	
<u>55</u> 60		Chert with Dolostone - bluish black (10B 2.5/1), dark brown (10YR 3/3) and li gray (10B 7/1) very fine to fine grain, medium hard, moc highly weathered VOID - possible solution cavity (61'-63')	ght bluish lerately to			
65		Chert with Dolostone - trace fully healed fractures, calcite fracture fill, very lim some orangish mud staining visible	ited recovery,			Vww
		VOID - possible solution cavity (66'-78')				
70						
75	-					
80		Dolostone with Chert - light bluish gray (10B 7/1) and bluish gray (10B 5/1) v fine grain, medium hard, not to moderately weathered, v healed fractures, calcite fracture fill, moderate- to high-	ery fine to isible fully angle			

6/			TEAT D		BORIN	G GV	VA-55R GE 3 OF 3 ECS37738
SOL	JTHERN	COMPANY SERVICES, INC.		Plant Bowe	n Cells 3 & 4 Wells		
EAR	TH SCII	ENCE AND ENVIRONMENTAL ENGINEERING		Cartersville	e, GA		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		ELEVATION Veak HCL Adderate REACTION	COMMENTS	Natur	ral Gamma
		fractures visible near bottom, bluish black to dark chert, trace orangish staining within some healed Dolostone with Chert (Con't)	reddish brown fractures	20			
85		VOID - possible solution cavity (85'-86')				<u>}</u>	
		Dolostone with Chert				}	
90		- light bluish gray (10B 7/1) and bluish gray (10B fine grain, medium hard, slightly weathered, trace healed calcite filled fractures, low- to high-angle fr larger core pieces recovered, trace chert, no visibl	5/1) very fine to to some visible f actures visible or le staining	fully n	Driller did not note any voids any voids within section 88'-103', but suggested open fractures due to	man MMM	
95					zones	hand	_
_100		- only fragments recovered					
		Bottom of borehole at 102.8 fee	et.				
105							
110							
115							
400							
120							
125							

So at Metropolytical BOWEN CELES 3 & 4 Metro So at Metropolytical BOWEN CELES 3 & 4 Metro EA So at Met	OUTHERN COMPANY RTH SCIENCE AND P E STARTED <u>4/14/2019</u> TRACTOR <u>Cascade E</u> LED BY J. Sigler ING DEPTH <u>82.96 ft.</u> ES TOC Elevation 69	Log update Ground Sur Top of PVC SERVICES, INC. ENVIRONMENTAI COMPLETED Drilling LOGGED BY GROUND WAT 2.17, Sonic Drilling -	ed with revised surface Elevation (f Casing Elevation Casing Elevation COG OF WE LENGINEERING <u>4/16/2015</u> SU <u>EQUIPMENT</u> B. Smelser FER DEPTH: DURING	urvey certific eet, NAVD88 n (feet, NAVI ELL CON PROJECT LOCATION RF. ELEV68 7868 ME _ CHECKED B G _43 ft. erburden, 6"OI	d 3/23/2021 i): 689.14 Dl88): 692.17 STRUCTION Plant Bowen Cells 3 Cartersville, GA 9.14 COORDIN THOD Sonic Y L. Millet COMP. 38.8 ft. D Casing in Rock, 4"0	& 4 Wells NATES: N 15 ANGLE DELAYED _3 D Core Well ins	WELL: GWA-56 PAGE 1 OF 3 ECS37738
	GROUNDWATER OBSERVATIONS	Z OL V Comple U Protect U 4-foot s	WELL DATA etion: tive aluminum cover square concrete pad	with bollards;			NOTES
30 30		689.14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Annular Fill: PC, 1 - 50lbs	I: Concrete Portland Ceme bags Gel, 65 g	nt-Bentonite Grout (12 al. Water)	2 - 47lbs bags	

(Continued Next Page)



(Continued Next Page)



			Log updated with revised survey Ground Surface Elevation (feet, I Top of PVC Casing Elevation (feet	v certified 3/2 NAVD88): 68 Pt NAVD188):	3/2021 9.14 692.17	BOR	NG GWA-56
so	UTHI		LOG OF TI	EST BOR	ING		PAGE 1 OF 3 <u>ECS37738</u>
SOU EAR	THERN TH SCIE	COMPANY SER NCE AND ENVI	VICES, INC. PI RONMENTAL ENGINEERING LC	ROJECT <u>Plant</u>	Bowen Ce ersville, G/	ells 3 & 4 Wells A	
DATE S	STARTED RACTOR	2 _4/14/2015 _Cascade Drilling	COMPLETED <u>4/16/2015</u> SURF. E	LEV. <u>689.14</u> METHOD	COC	RDINATES: N 1506128.38	E 2074633.08
		. Sigler 1 82 96 ft	LOGGED BY <u>B. Smelser</u> CHE	ECKED BY L. M	Aillet P 38.8 ft	ANGLE BE	ARING
NOTES	S TOCE	Elevation 692.17,	Sonic Drilling - 7"OD Casing in Overburd	len, 6"OD Casii	ng in Rock	, 4"OD Core Well installed. Ref	er to well data sheet
DEPTH (ft)	GRAPHIC LOG		MATERIAL DESCRIPTION	ELEVATION	leak HCL loderate REACTION trong	COMMENTS	Natural Gamma
		Silty Clay (CL - dusky red / c low plastic	ML) ark reddish brown (10R 3/4) fill dry, very	stiff to hard,	<u>≥ ∞</u> S	coil density gauged by thumb enetration	
5		Silt (ML) - dusky red / c interbedded cl subrounded/b	ark reddish brown (10R 3/4) fill dry, very ay lenses and medium to coarse/subang rittle to friable dolomite fragments	stiff, trace jular to			m MMM
		- trace mottlin dry, very stiff, coarse/angula fragments	g red (10R 5/6) and light brown (7.5YR white with reddish staining/medium to ve r to subangular dolomite fragments, trace	6/4) residuum ry e chert			MNN/MWW
15							MMMM
		Elastic Silt (M - mottled red 7/1) residuum interbedded M trace light gra	H) (10R 4/8), yellowish red (5YR 5/8) and lig moist, very stiff to stiff, low plastic, white L, light gray clayey zones have increase γ to white angular dolomite and chert frag	ght gray (10YR e to light gray d plasticity, gments			MMM
25							M-SAMAMANA MA
30	2 9 2 9 2 9 2 9 2 9	Gravelly Lean - trace mottlin residuum mois gray to dark b fragments, tra	Clay (CL) g yellowish red (5YR 5/8) and red (2.5Y st, very stiff to stiff, low to medium plastic rown/medium cobble/angular to subangu ce dolomite fragments	R 4/8) c, abundant lar chert			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

8 8 4							
Sowen Cells	OUTH		LOG OF TES	ST BOR	ING		BORING GWA-56 PAGE 2 OF 3 <u>ECS37738</u>
ANIE	C	OMPANY	PPO	IECT Diant	Rowor		
SO EA	UTHERN RTH SCI	I COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENG	INEERING LOC	ATION _Carte	ersville	, GA	
					Z		
DEPTH (ft) (ft)	GRAPHIC LOG	MATERIAL DES	SCRIPTION	ELEVATION	Veak 1 oderate trong REACTIO	COMMENTS	Natural Gamma
e)(CEL		Gravelly Lean Clay (CL) (Con't)			<u>≤ ≥ 0</u>		
40 40 45		✓ Sandy Lean Clay (CL) red (2.5YR 5/8) and reddish yello medium stiff to soft, low to medium cobble size angular chert fragments Chert (ledge) VOID - possible solution cavity (48) 	ow (7.5YR 6/6) residuu plastic, trace very coa	Im wet, irse to		Limited Recovery	MM MM Man Anna Man Man Man Man Man Man Man Man Man
Control of the set of the se		- mud filled void, no recovery					



		Log updated with revised survey constraints for the survey of Ground Surface Elevation (feet, NA	ertifiec VD88)	i 3/23/2 : 731.80	021]
		Top of PVC Casing Elevation (feet,	NAVD	88): 735	.15	BORING GWA-39 Z
S	OUT	LOG OF TEST BC	RIN	G		<u>GPC633179</u>
so	ITUE	PROJECT Lar	dfill Re	placement	Monitorii	ng Wells
EAI	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION PI	ant Bow	en		~
DATE	E STAR	TED <u>2/26/2016</u> COMPLETED <u>3/1/2016</u> SURF. ELEV. <u>731.80</u>		38 COO I		S: N:1502655.66 E:2071120.65
DRIL	LED B	T. Ardito LOGGED BY W. Shaughnessy CHECKED BY E	. Smels	er	ANGLE	BEARING
BOR	ING DE	PTH _115 ft GROUND WATER DEPTHDURING _58 ft CO	MP. <u>55</u>	5.9 ft.	DELAY	ED 55.5 ft. after 96 hrs.
NOTE	ES					
			Z	<i>C</i> (0		
Т	♀	<u>Z</u>	1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	ATEF		WELL DATA
(ft)	CAPH	MATERIAL DESCRIPTION	REA	NDW.	Comp	letion: tive aluminum cover with bollards:
	5	ELE	ak derate	SSEF	4-foot	square concrete pad
		Sandy Lean Clay (CL)	M M M		05.05	Surface Seal
		- and red (2.5YR 4/6) dry, stiff				Concrete
	H	Sandy Silt (ML)				
5		- motiled brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale				
		Well-graded Gravelly Sand (SW)	_			
		- and pinkish gray / grayish orange pink (5YR 7/2) pulverized				
		Sandy Sill (ML)	_			
10		brown / very pale orange (10YR 8/2) dry, stiff, some gravel				
		Dolostone (COBBLES AND BOULDERS) - dolostone boulders				Appender Fill
		Sandy Silt (ML) - brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brown /				Portland Cement-Bentonite
15		very pale orange (10YR 8/2) dry, stiff, some gravel Dolostone (COBBLES AND BOULDERS)				50lbs bags Gel, 45 gal. Water)
		- dolostone boulders				
		- mottled brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brownish yellow (10YR 8/2), dry stiff some gravel				
20		Sandy Lean Clay (CL)				
20		orange (10YR 6/6) dry, medium stiff, medium plasticity				
25		- with dolostone cobbles and gravel (pulverized rock)				5
		note vellow (EV 8/2) and vellow (2 EV 7/6) dry modium stiff modium				
30		plasticity				
						Annular Seal:
						Pellets (0.5 - 5gal buckets
						Plug 3/8 Chips (19 - 50lbs bags
35		- with dolostone cobbles and gravel (pulverized rock)				(90.0-20.0))
		- pale vellow (2.5Y 8/2) and white (N9) dry medium plasticity				
40						



so	DUTI	LOG OF TEST BO	RING	3		BORING GWA-39 Z PAGE 2 OF <u>GPC63317</u>
SOU EAF	UTHEF RTH SC	RN COMPANY SERVICES, INC. PROJECT Land CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Pla	dfill Rep nt Bowe	<u>lacement</u> en	Monitorii	ng Wells
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	leak HCL loderate REACTION trong	ROUNDWATER	Comp protec 4-foot	WELL DATA letion: tive aluminum cover with bollards; square concrete pad
45		Sandy Lean Clay (CL)(Con't) - interbedded with 6 inch clayey-sand lense Sandy Fat Clay (CH)	<u></u>	0		
<u>50</u>		- and brownish yellow (10YR 6/8) very damp, soft				
55 60		 Well-graded Gravelly Sand (SW) white (10YR 8/1) and brownish yellow (10YR 6/8) wet saturated, gravel lense 				
65		Sandy Elastic Silt (MH) - and light brownish gray / pale yellowish brown (10YR 6/2) soft, medium to high plasticity - with gravel Elastic Silt (MH)				 Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (0.5 - 5gal buckets (101 5'-98 0')) and Baroid Hole
70		 very pale brown / very pale orange (10YR 8/2) and light yellowish brown (10YR 6/4) very damp, soft, medium plasticity Fat Clay (CH) 	_			Èlug 3/8 Chips (19 - 50lbs bag (98.0'-25.0'))
75		- pale brown (10YR 6/3) and yellowish brown (10YR 5/6) very damp, medium stiff, medium plasticity - with gravel				
80		Sandy Elastic Silt (MH) - pale brown (10YR 6/3) and yellowish brown (10YR 5/6) damp, medium stiff, medium plasticity, with gravel				
85						



. REPLAC						
ANDFILL	1,0					BORING GWA-39 Z PAGE 3 OF 3
30WEN	SC	DUT	HERN LOG OF TEST BOI	RINC	3	<u>GPC633179</u>
LOGS/B	SOU	JTHE	RN COMPANY SERVICES, INC. PROJECT Land	lfill Rep	lacement	Monitoring Wells
DRING	EAF	RTH SO	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	nt Bowe	en	
EMENT WELLS 2016/B	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
EPLAC	~~~		Sandy Elastic Silt (MH)(<i>Con't)</i> - and yellowish brown (10YR 5/6) wet, medium to high plasticity, with		00	
FILLR	90		gravel - saturated, very soft			
PROJECTS/GA-BOWEN/LAND	95		- and light gray (10YR 7/1)			Annular Seal: Pel-Plug 3/8 Bentonite Coated Pellets (0.5 - 5gal buckets (101.5'-98.0')) and Baroid Hole Plug 3/8 Chips (19 - 50lbs bags (98.0'-25.0'))
LLING	100		- very dark brown / dusky yellowish brown (10YR 2/2), yellowish brown (10YR 5/6) and light gray (10YR 7/1) wet, soft			
RTDRI	100		- with gravel			
PLEX/CIVIL TECH SUPPOF	105					Filter: ←Filter Media 20/40 Silica Sand (4 - 50 lbs bags)
ERAL SERVICE COMF	<u>110</u>		- dark gray (10YR 4/1) and brownish yellow / dark yellowish orange (10YR 6/6) saturated			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
GENE			- with gravel			
PS/AP(115		- top of competent rock at 115 ft.			Cave-in to 115 ft.
SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/5/16 16:54 - S:WORKGROUP	120 125 130 135		Bottom of borehole at 115.0 feet.			

- REPLA		Log updated with revised survey certified Ground Surface Elevation (feet, NAVD88):	3/23/2021 731.80		
	DUTH	Top of PVC Casing Elevation (feet, NAVD8	8): 735.15 RING	BORING	GWA-39 Z PAGE 1 OF 3 <u>GPC633179</u>
	UTHERN RTH SCI	ICOMPANY SERVICES, INC. PROJECT Land ENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	ill Replacement Mor	nitoring Wells	
DATE NOO	E STARTI	ED_2/26/2016 COMPLETED_3/1/2016 SURF. ELEV. 731.80' N R_Cascade EQUIPMENT Tracked METHOD	AVD88 COORDIN	ATES: N:1502655.66	E:2071120.65
DRIL BORI NOTE	LED BY _ ING DEP [*] ES	T. Ardito LOGGED BY _W. Shaughnessy CHECKED BY _B. statement I'H _115 ft. GROUND WATER DEPTHDURING _58 ft. COM	Smelser AN P. 55.9 ft. DE	NGLE BE/ ELAYED _55.5 ft. after	96 hrs.
DEPTH DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	veak loderate trong	COMMENTS	Natural Gamma
		Sandy Lean Clay (CL) - and red (2.5YR 4/6) dry, stiff	(Recovery= and 7ft.)	=100% between 0	M. M. M.
		Sandy Silt (ML) - mottled brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brown / very pale orange (10YR 8/2) dry, stiff, some gravel Well-graded Gravelly Sand (SW) - and pinkish gray / grayish orange pink (5YR 7/2) pulverized rock/gravel Sandy Silt (ML) - mottled brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brown / very pale orange (10YR 8/2) dry, stiff, some gravel	(Recovery= 17ft.)	=95% between 7 and	W. Mary Ward Mary Mary
		Dolostone (COBBLES AND BOULDERS) - dolostone boulders Sandy Silt (ML) - brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brown / very pale orange (10YR 8/2) dry, stiff, some gravel Dolostone (COBBLES AND BOULDERS) - dolostone boulders Sandy Silt (ML)			hyper and the second se
20 300000000000000000000000000000000000		 - mottled brownish yellow (10YR 6/8), red (2.5YR 4/6) and very pale brown / very pale orange (10YR 8/2) dry, stiff, some gravel Sandy Lean Clay (CL) - mottled pale yellow (2.5Y 8/2) and brownish yellow / dark yellowish orange (10YR 6/6) dry, medium stiff, medium plasticity 	(Recovery= and 27ft.)	=95% between 17	my my my
- 79:91 91/9/ - 10		- with dolostone cobbles and gravel (pulverized rock)		05%	MMM
00 00 000 000 000 000 000 000 000 000		- pale yellow (5Y 8/2) and yellow (2.5Y 7/6) dry, medium stiff, medium plasticity	and 37ft.)	-95% between 27	Maryon Maryon
9 35 30 00 00 00 00 00 00 00 00 00 00 00 00 0		- with dolostone cobbles and gravel (pulverized rock)	(Recovery=	=100% between 37 /	M
40		- pale yellow (2.5Y 8/2) and white (N9) dry, medium plasticity	and 47ft.)]	Mym



BORING	GWA-39 Z PAGE 2 OF 3	3
	GPC633179)

	CO	LOG OF TEST BOP	RINC	BORING	PAGE 2 C <u>GPC633</u>	}∠)F 3 ; <u>179</u>
SOUT Eart	THERN TH SCIE	COMPANY SERVICES, INC. PROJECT Land	fill Rep it Bowe	lacement Monitoring Wells		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	eak HCL oderate REACTION trong	COMMENTS	Natural Gan	nma 29
	//,	Sandy Lean Clay (CL)(Con't)	<u>≥ ≥ o</u>	(Con't)	J A	-
45		 - interbedded with 6 inch clayey-sand lense Sandy Fat Clay (CH) - and brownish yellow (10YR 6/8) very damp, soft 		(Recovery=100% between 47 and 57ft.)	Mr. Mr. WMM have well	
55 55 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		 with gravel Well-graded Gravelly Sand (SW) white (10YR 8/1) and brownish yellow (10YR 6/8) wet saturated, gravel lense 		(Recovery=100% between 57 and 67ft.)	Maymon when my white	
65		 Sandy Elastic Silt (MH) and light brownish gray / pale yellowish brown (10YR 6/2) soft, medium to high plasticity with gravel Elastic Silt (MH) very pale brown / very pale orange (10YR 8/2) and light yellowish brown (10YR 6/4) very damp, soft, medium plasticity 		(Recovery=100% between 67 and 77ft.)	WWWWWWWWWWWW	
70		Fat Clay (CH) - pale brown (10YR 6/3) and yellowish brown (10YR 5/6) very damp, medium stiff, medium plasticity - with gravel			Monter Mar Mar	
80		Sandy Elastic Silt (MH) - pale brown (10YR 6/3) and yellowish brown (10YR 5/6) damp, medium stiff, medium plasticity, with gravel		(Recovery=100% between 77 and 87ft.)	man Manman Maran	



BORING	GWA-39 Z PAGE 3 OF 3
	<u>GPC633179</u>

VEN LANDF	DUTH		RIN	BORING	GWA-39 Z PAGE 3 OF 3 <u>GPC633179</u>
DGS/BO	C	OMPANY BRO JECT and	Ifill Ror	Accement Monitoring Wells	
SOU SOU EAR	UTHERI	N COMPANY SERVICES, INC. LOCATION Plan	nt Bow	en	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	eak HCL oderate REACTION	COMMENTS	Natural Gamma
ANDFILL REPLAC		Sandy Elastic Silt (MH)(Con't) - and yellowish brown (10YR 5/6) wet, medium to high plasticity, with gravel - saturated, very soft	<u> </u>	and 97ft.) (Con't)	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
JPPORTUBRILLINGIPROJECTS/GA-BOWENNL		- and light gray (10YR 7/1) - very dark brown / dusky yellowish brown (10YR 2/2), yellowish brown (10YR 5/6) and light gray (10YR 7/1) wet, soft - with gravel		(Recovery=80% between 97 and 107ft.)	Mry Mar Mar Mary Mary
105 105 105 105 105 105 105 105 105 105		- dark gray (10YR 4/1) and brownish yellow / dark yellowish orange (10YR 6/6) saturated		(Recovery=62% between 107 and 115ft.)	SAM NY ANY
GENER		- with gravel			
7 HMS 115		- top of competent rock at 115 ft.			
1/10 16:52 - 2:.МОНКРЕИСИ 120		Bottom of borehole at 115.0 feet.			
125 125					
- 130 130					
007 2007 2007 2007 2007 2007 2007 2007					

		4	Log updated with revised su Ground Surface Elevation (fe Top of PVC Casing Elevation	rvey cert et, NAVI (feet, NA	ified 3 088): ' AVD88	3/23/20 729.57 8): 732. (21 62	BORING GWA-39	RZ
S	out		LOG OF TES	r Bor	ING	i		PAGE 1 C <u>6122160</u>)F 4 <u>287</u>
SO EA	UTHEI RTH S	RN COMPANY SERVICES, INC. CIENCE AND ENVIRONMENTAI	PROJE - ENGINEERING LOCAT	CT <u>Plant</u>	Bower ersville	ı , GA			
DATE	E STAF	RTED <u>11/3/2016</u> COMPLE	TED <u>11/4/2016</u> SURF. ELEV.	729.57 ft N	<u>AVD</u> 88	COORD	INATE <u>S:</u>	N:1502618.73 E:2071164.20	
DRIL		Y _Tommy and Rodger _LOGGED		D BY	D 96	ft bas		BEARING	
NOTE	IS <u>*</u> S	ample Logged by geologist emp	bloyed by Amec Foster Wheeler			it byb		<u>-10.22 ft.,20 ddy0</u>	
DEPTH (ft)	GRAPHIC LOG	MATERIAL	DESCRIPTION		ak HCL lerate REACTION	OUNDWATER SERVATIONS	Comple Protecti 2-foot s	WELL DATA tion: ve casing set in concrete pad; quare concrete pad	
		- SILT (ML), red and beige (5 \	/R 8/2 - 5/8), stiff, dry	ELEV	Wea Mode Stror	OBS		Annular Fill: Aquaguard Grout Mixture	ELE\ (DEPTH
5 10 10 15		- same as above, stiff, dry							
- 1/6/17 11:11 - C:\USERS\MACI		- same as above, stiff, dry - CLAY (CL), white and gray (5 moist	y YR 8/1 - 8/2), low plasticity, slightly	704.6	5				
MITH WELL - ESEE DATABASE.GU									
ADDE GEOLOGY		- SILT (ML), light orange (5 YF - CLAY (CL), light brown, mois	t 7/8), stiff, moist t	693.6 692.6	5				

⁽Continued Next Page)

H (‡) 45	GRAPHIC LOG	MATERIAL DESCRIPTION (Cont.)	ELEV	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	Comple Protec: 2-foot s	WELL DATA etion: tive casing set in concrete pad; square concrete pad
45		(Cont.)		220	00		\ (U
50 55 60 65 70 75 80		 - same as above, light brown to white (5 YR 8/1 - 6/6), low plasticity, chert nodules and lenses, moist - same as above, (5 YR 8/1), moist - same as above, orangish brown (5 YR 6/6), very moist - sandy CLAY (CL), orangish brown (5 YR 6/6), black layering 	654.6				Annular Fill: Aquaguard Grout Mixture 66 Annular Seal: 3/8" bentonite chips
85							

٦

Г

⁽Continued Next Page)

s	DUT	HERN A LOG OF TEST	BORII	NG			BORING	GWA-3 PAGE : 61221	9RZ 3 OF 4 60287
SO	UTHER RTH SC	RN COMPANY SERVICES, INC. PROJEC	T Plant Bo	<u>owen</u> sville.	GA				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		Adderate HCL Strong REACTION	BROUNDWATER DBSERVATIONS	Comp Prote 2-foot	WELL DATA oletion: ctive casing set in square concrete	concrete pa	ad; ELEY
90		(<i>Cont.</i>) - sandy CLAY (CL), orangish brown (7.5 YR 5/6), gravel, stiff, very moist - CLAY with gravel (CL), whte (7.5 YR 8/1), stiff, saturated	640.6		Ŷ		Annular Seal 3/8" bentonit	: e chips	
100		- competent DOLOMITE, gray, wet	630.6						
105		- same as above							
110		- same as above							
120		- same as above, white siliceous veins					Annular Seal 3/8" bentonit (non-coated)	: e pellets	610.6 (119.0
125							Filter: silica filter sa Standpipe: 2 OD PVC (nd SCH 40)	605.0 (124.0 602. (127.0
130		- same as above, white siliceous veins					Screen: 10 ft; pre-pad	ж	

s	TUC		OF TEST E	OR	RING		BORIN	IG GWA-39F PAGE 4 O <u>6122160</u>	RZ 0F 4 287
SO	UTHEF RTH S	RN COMPANY SERVICES, INC. CIENCE AND ENVIRONMENTAL ENGINEERING	PROJECT	<u>Plant</u> Cart	Bowen	GA			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		ELEV	Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DA Completion: Protective casing se 2-foot square concre	TA t in concrete pad; ste pad	ELEV (DEPTH)
		Bottom of borehole at 137.0 feet.		392.0					
140 141 145 145 145 150 155 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 170 171 171 175									
I80	-								


			Log updated with revis Ground Surface Elevation	ed surv on (fee	ey cert t, NAVI	ified 3/ 088): 72	23/2021 28.93		
so	DUT	HERN	I OG Casing Elev	ation (1	reet, NA): 731.77 NG		BORING GWA-4 PAGE 1 OF
SOL	JTHER	COMPANY N COMPANY SERVICES SIENCE AND ENVIRONN	S, INC.	PR		Monitori Plant B	ing Wells		
DATE	STAR	TED C	OMPLETED S	URF. EL	EV . 72	8.93	COORDIN	ATES	: N:1503195.09 E:2071299.94
ONT	RACTO	DR Boart Longyear	EQUIPMENT		ME		Rotosonic	_	
DRILL	ED BY	LO	GGED BY G. Dyer	CHE	CKED B	ſ		ANG	ILE BEARING
		PTH <u>153 ft.</u> GR	COUND WATER DEPTH: DURI	NG		COMP.		DEL	AYED
	S_ <u>vv</u> e	ell Installed. Refer to we	il data sneet.				1		1
DEPTH (ft)	GRAPHIC LOG	MATERIA	L DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		- Gravelly Sand; mo brown; sand estimat and silts and clays a quartz, chert and ca weakly cemented to	ttled white, gray, tan and ted to be 55%, gravel at 45% tt 10%; gravel is subrounded lcite; probably flood deposits; cemented						
<u>5</u> 10		- SAA; less mottling fragments more sub	of color, more red-brown; dry; angular						
15		- Sandy Silt; red-bro of quartz, chert and	wn, few subangular fragments dolomite; dry	716					
20				709					
		- Zone of white, clay	rey silt	708					
		 Sandy Silt; red-bro of quartz, chert and Clayey silt; mostly mud cut through silt 	wn, few subangular fragments dolomite; dry white but veins of brown-red layers; Slightly damp; shows	707					
25		pressure/dissolution	features	700					
		- mottled tan, white a prevalent fines; grav quartz; slightly damp	and brown Gravelly Sand with rels are very large and angular o						
<u></u>		- Clayey Silt; white to interbedded layers of (dolomitic and subal to high plasticity year	o brown-tan and orange with of fine sand; few gravels ngular); slightly damp, medium ov strong/berd	698 1					
35	202	- Gravelly Clay; tan less than 10%, low p	and orange, contains sands	693					



SOUTHERN COMPANY SERVICES, INC.

LOG OF TEST BORING

BORING GWA-40 PAGE 2 OF 4

	EAF	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	Bowen		
LOGS FOR BORAL.GPJ	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
3			(con't)	688					
NITORING WE	· · · · · · · · · · · · · · · · · · ·		- Clayey Silt; white, gray, tan and orange; clay is low plasticity; gravel is angular chert; sand less than 5%						
-4/DATA/BORING LOGS/MO	<u>45</u> _50		- Silty clay with gravel, tan and orange, clay is low plasticity, damp						
011/ES2042_BAG HOUSE UNITS 1	55		- Clayey silt to Silty Clay; tan and white, moist, low plasticity, few gravel sized fragments, moist						
OJECTS/PROJECTS/BOWEN/2	<u>60</u> 65		- Gravelly silt to Gravelly clayey silt; tan, white and gray; pressure solution features, banding and flow paths; wet, low plasticity	667					
ESEE MAJOR PF	· · · · · · · · · · · · · · · · · · ·		Clavov Silt and Silty Clay with faw delamitia	660					
1/27/12 15:36 - T:\	70		gravels; tan, gray and white; very damp; low plasticity						
ABASE.GDT -	75		Crovelly Sand, mattled ton, eronge, grov and	653					
ESEE DAT/			- Clayey Sand, motive tan, orange, gray and white; dry - Clayey Silt to Silty Clay with slight gravel	651					
H ENGINEERING LOGS -	80		content, tan and white; banding present; sand content increases with depth						
GEOTEC			- Clayey Silt to Silty Clay; tan to white with some						



SOUTHERN COMPANY SERVICES, INC.

LOG OF TEST BORING

BORING GWA-40 PAGE 3 OF 4

EAI	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LC	CATION	Plant E	Bowen		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
90 95 		manganese staining (black); damp; medium to low plasticity; infrequent gravel beds (cont)	623					

		5.								BORING GWA-40 PAGE 4 OF 4
	SC	DUT		LOG	G OF TE	ST B	ORIN	NG		
	SOL	JTHER	N COMPANY SERVICE	S, INC.	PR	OJECT _	Monitori	ng Wells		
	EAF	RTH SC		MENTAL ENGINEERING	LO	CATION	Plant B	owen		
DEPTH	(ft)	GRAPHIC LOG	MATERIA	L DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
	35		(con't)							
	40									
	45									
1	50									
					576					
			Bottom of b	oorehole at 153.0 feet.						Top of Rock: Bottom of Boring.
	60									
 	65									
- · · ·		-								
	70									
2 										
5 1	75	-								
	80									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **738.91** Top of PVC Casing Elevation (feet, NAVD188): **742.35**



PLANT BOWEN Optical Teleview Magnetic North and 3D Image GWA-41

Depth	NM Imag	je GWA-41	creen Int./Water Leve	3D Image GWA-41	
1ft:15ft	0° 90° 1	80° 270° 0°	0 1	123°	1
6					
7					
0			=		
9					
11					
12				Pipe Joi	nt (12.5')
13					
14					
15	1. 2.				



















85	M M	
90	A AMA A	
95		
100		

ſ				Log updated with revis Ground Surface Elevati Top of PVC Casing Elev	ed sui on (fe vation	rvey cer et, NAV (feet, N	tified 3 D88): 7 AVDI8	3/23/2021 738.91 8): 742.35		BORING GWA-41
	so	DUT		LOG O	F TE	ST B	ORII	NG]	PAGE 1 OF 2
	SOI	ITHER	N COMPANY SERVICES II	NC	PR	OJECT	Monitori	ing Wells		
	EAF	RTH SC	CIENCE AND ENVIRONMEN	ITAL ENGINEERING	LO	CATION	Plant E	Bowen		
(AL.GPJ	DATE	STAR	TED _6/6/2011 COM	PLETED <u>6/6/2011</u> SU	RF. EL	.EV. 73	3.91' NA	VD88 COOR	DINA	TES: N:1503519.02 E:2071046.18
2 2 2 2 2 2 2		FD B	UR Boart Longyear	EDBY G Dver	CHE		, ,	Kotosonic	ANG	I E BEARING
2 C L	BORI	NG DE	PTH 85 ft. GROU	IND WATER DEPTH: DURIN	_ OnL		COMP.		DEL	AYED
ĬĽČ	NOTE	s_w	ell installed. Refer to well d	ata sheet.					-	
	DEPTH (ft)	GRAPHIC LOG	MATERIAL D	ESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
PNING		///	- Sandy Clay; gray to br	own; damp; low plasticity						
			- Silty sand with some o	lay; gray; dry; material is	736					
	5		competent and clumped	d						
			Clavov Silty Sandy: m	ottlad grav brown and tap:	733					
			dry; root structures and	organic material	731					
	10		- Gravelly Sand; tan and present; moisture decre increasing with depth	d brown; moist to wet; clay asing with depth; fines						
			544		726					
			- 0///							
	20									
¥N L										
		, Ô								
- 00.0										
	25				740					
17/1 -			- Clayey Sand; tan to bi	rown with large subangular	713					
פר			clasts of chert; dry; clay hard; low plasticity; frag	r increasing with depth; ments become smaller						
1040L	20		with depth							
	30									
500										
	35									
					703					
IDN I			- Fine to medium sand;	tan; wet	704					
			- Clayey Sand; brown to and dolomitic clasts; da	o tan with prevalent chert mp	701					



BORING GWA-41

PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

EA	RTH SC	EIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant Bowen				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS	
		(con't) - SAA	<u>696.4</u> 693						
50 HOLD STORE ON I STORE ON I STORE OF I STO		- Sandy Clay; tan (some brown) with few chert and dolomitic fragments; clay is hard and of low plasticity; slightly moist	683						
60 65		- Clayey Sand to Sandy Clay; clay increasing with depth; brown to tan; sand is medium grained to coarse, small subangular to few subrounded chert and dolomitic clasts, very damp	673						
70 70 75		- Clayey Silty Sand; tan; very moist; coarse grained; few chert and dolomitic fragments (subangular); moisture content increasing with depth	663						
	• • • • • • • • • • • • • • • • • • •	- Gravelly Sand; tan; medium and coarse grained; wet; gravels are subangular; high yield zone from 76'-85'	654					Bottom of Holo	
		Bottom of borehole at 85.0 feet.							

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **737.95** Top of PVC Casing Elevation (feet, NAVD188): **743.08**

WELL CONST	TRUCTION LOG		Southern Company Generatio	n
PROJECT:	CCB Disposal	DRILL	LING Boart Longyear	WELL
		DRILL	LER: Boart	NAME
LOCATION:	Bowen	RIG T		
LUGGER:	K. Lewis	DRILL	LING METHODS: ROTOSONIC	GWA-41R
DATE CONSTRU	JCTED. 0/1/2011		ПЕРТН	EL EVATION
NOT APPLICABI	LE:		FEET	FT, MSL
Locking Hinged T	Гор			
			TOP OF RISER 5.13	743.08
1/4-inch Vent		2" Thr	readed Riser Cap	
1/4-inch Weep He	ole			
2-ft x 2-ft concrete	e pad			707.05
			GROUND SURFACE 0.00	/3/.95
			PROTECTIVE CASING	
			SIZE: 4x4-inch	
			TYPE: Anodized Aluminium	
			BOTTOM OF PROTECTIVE CASING	
			BACKEILI MATERIAL	
			TYPE: Portland Cement	
			AMOUNT:	
			RISER CASING	
			DIA: 2-inch	
			TOP OF SEAL 95.06	642.89
			ANNULAR SEAL	
			TYPE: Hole Plug 3/8"	
			PLACEMENT: Free fall	
			TOP OF FILTER PACK 100.56	637.39
			FILTER PACK	
			TYPE: DSI Sand - 2A (20/30)	
			AMOUNT: 7 bags	
			FLACEIVIENT Treffile, wash with water	
			BOTTOM OF RISER / TOP OF SCREEN 102.76	635.19
			SCREEN	
			DIA: 2-inch 10ft U-Pack	
			TYPE: Schedule 40 PVC	
			OPENING WIDTH: U.U1-Inch	
			SLOT SPACING: 0.25-inch	
			SLOT LENGTH:	
			BOTTOM OF SCREEN 112.76	625.19
Flush-threaded e	nd cap			
			BOTTOM OF CASING 113.06	624.89
	Ц			
	п	OLL DIA. U		
			I	1

PAGE 10 SOUTHERN COMPARY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL LENGINEERING PROJECT Monitoring Wells SOUTHERN SCIENCES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Monitoring Wells DATE STARTED 6/1/2011 COMPLETED 6/1/2011 SURF. ELEV. 737.95 'NAVD88 COORDINATES: N-1503527.39 E.2071050. COONTRACTOR Board Longver DATE STARTED 6/1/2011 COMPLETED 6/1/2011 SURF. ELEV. 737.95 'NAVD88 COORDINATES: N-1503527.39 E.2071050. CONTRACTOR Board Longver OPRILED BY LOGGED BY K. Byrd CONTRACTOR Board Longver ORDER UPON WATER DEPTH: DURING COMP. DELAYED NOTES Well installed. Refer to well data sheet. Tage do MATERIAL DESCRIPTION Tage do OBCRIPTION COMP Colspan="2">COMMENTS OCMMENTS COMMENTS COMMENTS OBCRIPTION Tage do OBCRIPTION COMMENTS OBCRIPTION OBCRIPTION <td col<="" th=""><th></th><th></th><th></th><th>Log updated with revis Ground Surface Elevat Top of PVC Casing Ele</th><th>sed su ion (fe vation</th><th>rvey ce et, NA\ (feet, N</th><th>rtified (/D88): NAVDI8</th><th>3/23/2021 737.95 38): 743.08</th><th></th><th>BORING GWA-41R</th></td>	<th></th> <th></th> <th></th> <th>Log updated with revis Ground Surface Elevat Top of PVC Casing Ele</th> <th>sed su ion (fe vation</th> <th>rvey ce et, NA\ (feet, N</th> <th>rtified (/D88): NAVDI8</th> <th>3/23/2021 737.95 38): 743.08</th> <th></th> <th>BORING GWA-41R</th>				Log updated with revis Ground Surface Elevat Top of PVC Casing Ele	sed su ion (fe vation	rvey ce et, NA\ (feet, N	rtified (/D88): NAVDI8	3/23/2021 737.95 38): 743.08		BORING GWA-41R
CLOMPANY SOUTHERN COMPANY SERVICES, INC. PROJECT Monitoring Wells LOCATION Plant Boven ATTE STARTED 01//2011 COMPLETED 01//2011 SURF. ELEV. 737.95' NAVD88 COORDINATES: N:1503527.39 E-2071060. CONTRACTOR Boart Longwar COMPLETED 01//2011 SURF. ELEV. 737.95' NAVD88 COORDINATES: N:1503527.39 E-2071060. ONTES Well installed. Refer to well data sheet. Vel installed. Refer to well data sheet. Value installed. Refer to well data sheet.<	S	OUT	HERN	LOG O	F TE	ST B	ORI	NG		PAGE 1 OF 3	
DATE STARTED 6/1/2011 COMPLETED 6/1/2011 SURF. ELEV. 737.95' NAVD88 COORDINATES: N:1503527.39 E:2071050. CONTRACTOR Boart Longyear EQUIPMENT METHOD Rotosonic PRILED BY LOGGED BY K. Byrd CHECKED BY ANGLE BEARING BORING DEPTH 115.ft. GROUND WATER DEPTH: DURING COMP. DELAYED DELAYED NTES Well installed. Refer to well data sheet. To grained To grained COMMENTS Tagene - Silty sand; top soil; reddish yellow; dry; very fine grained 736 COMMENTS COMMENTS 5 - Sand Cary, with cheft ragments, brown; damp; very fine to fine grained, clay context in necessing with daph 744 st Stard Cary yand with quartz pebbles; orange reddish (forwn); damp; very fine to fine grained 719 10 - SAA except in reddish in color 719 715.5 715.5 715.5 20 - Clayey Sand with quartz pebbles; orange reddish (forwn); damp; very fine to fine grained 715.5 715.5 715.5 715.5 715.5 20 - Clayey Sand with quartz pebbles decreasing in size; brown; fine grained 715.5 715.5 715.5 715.5 715.5 20 - Clayey Sand with quartz pebbles decreasing in size; br	SO EA	OUTHER RTH SO	COMPANY RN COMPANY SERVICES, II CIENCE AND ENVIRONMEN	NC. NTAL ENGINEERING	PR LO	PROJECT Monitoring Wells LOCATION Plant Bowen					
PRILED BY LOGGED BY K. Byrd CHECKED BY ANGLE BEARING BORING DEPTH 116 ft. GROUND WATER DEPTH: DURING COMP. DELAYED NOTES Veli installed. Refer to well data sheet. BORING DEPTH 110 ft. Y U O MATERIAL DESCRIPTION Y Y Y O Y U O MATERIAL DESCRIPTION Y Y Y O O Y Y O O Y Y O O Y Y O Y Y O O Y Y O Y Y O Y Y O Y Y O Y Y Y O Y Y Y O Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y <		E STAF TRACT	RTED_6/1/2011COM OR_Boart_Longyear	IPLETED <u>6/1/2011</u> SU EQUIPMENT	EV. <u>73</u>	7.95' NA' FHOD F	VD88 COOR	DINA	ES: N:1503527.39 E:2071050.84		
BORING DEPTH _ 116 ftGROUND WATER DEPTH: DURINGCOMPDELAYED	DRIL	LED B	LOGG	ED BY K. Byrd	CHEC	CKED BY	′ <u> </u>		ANG	LE BEARING	
NOTES Well installed. Refer to well data sheet. Hard Control Image: Section of the section	BORI	ING DE	PTH 116 ft. GROU	IND WATER DEPTH: DURIN	G		COMP.		DELA	YED	
Hand Description Note of a pained mark Note pained mark Note of a pained mark	NOTE	ES W	ell installed. Refer to well d	ata sheet.							
- Silly sand; top soil; reddish yellow; dry; very fine grained 736 - SAA except gray 736 - Clayey Sand; gray; damp; very fine to fine grained; day content increasing with depth 734.5 - Sandy Clay with chert fragments; brown; damp; very fine to fine grained - Sandy Clay with quartz pebbles; brown; damp; very fine to fine grained - Sandy Clay with quartz pebbles; brown; damp; very fine grained, medium plasticity - Sandy Clay with quartz pebbles; brown; damp; very fine grained, medium plasticity - SAA except in reddish in color - SAA except in reddish in color - Sandy Clay with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 715.6 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces	DEPTH (ft)	GRAPHIC LOG	MATERIAL D	DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS	
- SAA except gray 736 - Clayey Sand (gray; damp; very fine to fine grained) 734.6 - Sandy Clay with chert fragments; brown; damp; very fine to fine grained - Sandy Clay with quartz pebbles; brown; damp; very fine grained; medium plasticity 10 - SAA except in reddish in color - Sandy Clay with quartz pebbles; orange reddish (brown); damp; very fine grained; medium plasticity - SAA except in reddish in color - SAA except in reddish in color - SAA except in reddish in color - Sandy Clay with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Clayey Sand with quartz pebbles; orange reddish - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces			- Silty sand; top soil; red	ddish yellow; dry; very fine							
10 - Sandy Clay with chert fragments; brown; damp; very fine to fine grained - Sandy Clay with quartz pebbles; brown; damp; very fine grained; medium plasticity 10 - SAA except in reddish in color - SAA except in reddish in color - Sandy Clay with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - SAA except in reddish in color			- SAA except gray	mp: yory fing to fing	736						
5 - Sandy Clay with chert tragments; brown; damp; very fine to fine grained - Sandy Clay with quartz pebbles; brown; damp; very fine grained; medium plasticity 10 10 - SAA except in reddish in color - SAA with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces		777	grained; clay content in	creasing with depth	734.5						
- Sandy Clay with quartz pebbles; brown; damp; very fine grained; medium plasticity - SAA except in reddish in color - SAA except in reddish in color - SAA except in reddish in color - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Sandy clay with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces	5		 Sandy Clay with chert very fine to fine grained 	fragments; brown; damp;							
10 - SAA except in reddish in color 15 - 15 16 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 719 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces			 Sandy Clay with quart very fine grained; mediu 	z pebbles; brown; damp; um plasticity							
10 - SAA except in reddish in color 15 - 15 - 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 20 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces											
10 - SAA except in reddish in color 15 - SAA except in reddish in color 15 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 715.5 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces	10										
- SAA except in reddish in color 15 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces	10										
15 719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 20 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces			- SAA except in reddish	n in color							
15 719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 715.5 715.5 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained - SAA with chert pieces											
20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 719 719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 715.5 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces	15										
20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 715.5 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces											
719 20 - Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained 715.5 - Sandy clay with quartz pebbles decreasing in size; brown; fine grained 25 - SAA with chert pieces											
Clayey Sand with quartz pebbles; orange reddish (brown); damp; very fine to fine grained					719						
- SAA with chert pieces	20		- Clayey Sand with qua (brown); damp; very fin	rtz pebbles; orange reddish e to fine grained							
- SAA with chert pieces											
- SAA with chert pieces			- Sandy clay with quartz	z pebbles decreasing in	715.5						
- SAA with chert pieces	25		size; brown; fine graine	d							
- SAA with chert pieces											
			- SAA with chert pieces								
			o, v t with onort proces	,							
	30										
- Sandy clay with guartz and chert pieces;			- Sandy clay with quartz	z and chert pieces:							
brownish yellow; moist; fine-grained			brownish yellow; moist;	fine-grained							
- Sandy Clay with small quartz pebbles and large			- Sandy Clay with small	l quartz pebbles and large							
35 carbonate chunks; light brown; moist; very fine grained	35		carbonate chunks; light grained	brown; moist; very fine							
701					701						
- Silty clay with small quartz fragments; light brown; moist; very fine grained			 Silty clay with small qu brown; moist; very fine 	uartz fragments; light grained							
- SAA with added chert pieces	40		- SAA with added chert	pieces							

(Continued Next Page)



SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

EA	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	Bowen		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		(con't) - SAA with increasing chert size fragments; sand content increasing as well						
			694					
45		 Clayey sand with weathered carbonate and chert pieces; mottled yellowish very pale brown; damp, fine to medium grained 	691					
		- Sandy clay with small chert pieces, very pale brown/yellowish brown; moist; very fine to fine grained		-				
50								
		- SAA with weathered carbonates, sand content increasing	685					
55		 Clayey Sand, weathered carbonates and large pieces of smokey quartz; mottled yellow, brown, and white; damp; very fine to fine grained Clayey sand with large pieces of cherty quartz; 						
		yellowish brown, damp, very fine to fine grained						
60								
65								
70								
75								
		- SAA except for very fine grained with yellow lenses of silty clay						
80								
85		- SAA except fine grained to medium grained, wet						



BORING GWA-41R PAGE 3 OF 3

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

	EAF	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	lowen		
	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
	90		<i>(con't)</i> - 0.5 feet lense of mottled purple, dark gray pieces of siltstone						
		7	- Dolostone	646.5					
PURING LUG	95								
AIA			Covity	642					
14		$ \vee $	- Cavity						
2 Z				630					
	100		- Dolostone, 0.5 feet of recovery and small amount of gravel, wet, driller indictaed no cavity drilled like gravel filled cavity.	039					
RAG		\vdash	unied like gravel lined cavity						
747		\square							
E SZ(
	105								
VEN/									
DB/D		\vdash							
S	110	\vdash							
СО СО Ц		\square	- Dolostonered staining						
r F									
Z ∐ ∐	115			622					
Ĩ			Bottom of borehole at 116.0 feet.	022					Bottom of hole, set well.
- 02:0									
121	120	-							
		-							
LUE.									
AB/									
2 11	125	1							
й Ц									
200		-							
D Z		-							
	400								
	130	-							
E I		t							
Ц С		1							
빙									

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **734.45** Top of PVC Casing Elevation (feet, NAVD188): **738.05**

WELL CONST	FRUCTION LOG	Southern Company Generat	ion
PROJECT:	CCB Disposal	DRILLING CBoart Longyear	WELL
		DRILLER: Boart	NAME
LOCATION:	Bowen	RIG TYPE: RotoSonic	
DATE CONSTRI	ICTED: 6/1/2011	DRIELING WETHODS. ROUSONIC	GWA-42
B/TE CONCINC	0120.0/1/2011	DEPT	
NOT APPLICABI	LE:	FEET	FT, NAVD88
Locking Hinged T	ор		
		TOP OF RISER 3.60	738.05
1/4-inch Vent		2" Threaded Riser Cap	
1/4-inch Weep Ho	ole		
	e pau	GROUND SURFACE 0.00	734.45
		PROTECTIVE CASING	
		SIZE: 4x4-inch	
		TYPE: Anodized Aluminium	
		BOTTOM OF PROTECTIVE CASING	
		BACKFILL MATERIAL	
		TYPE: Portland Cement	
		AMOUNT:	
		RISER CASING	
		DIA: 2-inch	
		TYPE: Schedule 40 PVC	
		JOINT TYPE Flush Threaded	
		TOP OF SEAL 64 56	669 89
		ANNULAR SEAL	
		TYPE: Hole Plug 3/8"	
		Bentonite Pellets	
		AMOUNT: 2 bags	
		PLACEMEN I: Free fail	66/ 89
		FILTER PACK	004.09
		TYPE: DSI Sand - 2A (20/30)	
		AMOUNT: 7 bags	
		PLACEMEN Tremie; wash with water	
		BOTTOM OF RISER / TOP OF SCREEN 71.76	662.69
		SCREEN	
		DIA: 2-inch 10ft U-Pack	
		TYPE: Schedule 40 PVC	
		SLOT SPACING 0 25-inch	
		SLOT LENGTH:	
		BOTTOM OF SCREEN 81.76	652.69
Flush-threaded er	nd cap		
		BOTTOM OF CASING 82.06	652.39
	Н	DLE DIA: 6"	

		Log updat Ground Su Top of PVC	ed with re Irface Elev C Casing E	vised s ation (f levatio	urvey c eet, N/ n (feet,	ertified 3/2 AVD88): 73 NAVD188)	23/202 [°] 4.45 : 738.0	5 BORING GWA-42 PAGE 1 OF 3	
SC E/	SOUTHERN COMPANY SERVICES, INC. PROJECT Monitoring Wells EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plant Bowen								
	E STAR	TED COMPLETED	SURF. EL	.EV . 73	4.45' NA	<u>V</u> D88 COO		ES: N:1503823.34 E:2071049.95	
		OR Boart Longyear EQUIPME	NT		rhod <u>f</u>	Rotosonic	41101		
		PTH 85 ft GROUND WATER DEPTH: DI		SKED BI	COMP	55 ft		= Bearing /FD	
	ES <u>W</u>	/ell installed. Refer to well data sheet.				0011.			
	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS	
		- Sand with gravel; brown; root material gavel;	700						
5		- Silty sand; tan, orange and white; with angula chert fragments; dry; black weathering bands	733 r						
<u>,</u>			728.5						
10		- Silty clay with highly weathered chert and dolomite clasts; light tan, gray and white; low plasticity; dry							
15		- Sity clay with angular to subangular chert cla mottled tan, orange and gray; dry; low plasticity	sis; /						
		- Slity clay with weathered chert and dolomite clasts; orange and white; damp; low plasticity	714.5						
<u>.</u>		weathering surfaces; mottled orange, tan and white; low plasticity; damp							
25		- Clay; streaked tan and white; moist; medium low plasticity	to						
		- Sandy, silty clay with few angular chert and dolmite fragments; orange; low plasticity; damp and hard	708						
30			600 5						
		 Silty Sand; white to gray; sand is carbonate Clayey silty sand with small carbonate fragments; dry 	039.0						



BORING GWA-42

PAGE 2 OF 3

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING
 PROJECT
 Monitoring Wells

 LOCATION
 Plant Bowen

		LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			(con't)	693.5					
1921 1921		Š	gravels are dolomitic in nature						
				690.5					
45			 Clayey silty sand; orange and tan; hard; slightly damp; few dolomitic fragments 	688 5					
			- Clayey sand; orange and tan; hard; few chert	000.0					
50 50									
ກ ທີ									
			- SAA: less hard						
8 <u>55</u>	-//		▪ SAA: harder						
ES:204									
1102									
60 GMEN									
9 									
			- Moist Zone from 64 to 66 feet						
∠ ∐ ∭ Ω									
	-								
75									
Х Ч Ч									
<u></u>			- SAA: tan and brown						
		···/.	- Lost sample	648.5					

		A						BORING GWA-42
S	OUT		F TE	ST E	ORIN	IG		PAGE 3 OF 3
S	OUTHER	N COMPANY SERVICES, INC.	PR	OJECT	Monitori	ng Wells		
E/	ARTH SC	ENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	owen		
DEPTH (#)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
 	•••	(con't)						
95		- Clayey Silty Sane with few gravel sized fragments; orange and tan	642.5					
		- SAA: more gravel and moist to very moist						Bottom of Well Set (102 feet).
105		- Silty clay; orange; damp; medium to low plasticity; hard - Weathered dolostone: gray with some sand and	<u>628.5</u> 626.5					
110		silt; dry						
115	<u>;</u>		618.5					
		Bottom of borehole at 85.0 feet.						
120)							
125	5							
130)							

Depth	Im	age-NM GWA-43		creen Int./Water Leve	GWA-43 3D	
1ft:15ft	0° 90°	180° 270	° 0°	0 1	-0°	1
12.0						
13.0						
14.0						
15.0			- And			
16.0			and the second se			
17.0			a name			
18.0						
19.0						
20.0						
			A CONTRACTOR OF			
21.0						



							1.2	
	33.0	 -			1000			
			1. 1					
					Min			
			1.1.1		1000			
		-	E.		-			
			100					
	34.0	 _			-	-		
					-			
			1.1					
					2			
			-		-			
		9			100			
	35.0	1.12	- San					
	00.0							
			1 1 1 1 1 1		E.			
					and the second second			
		1.12			The weather			
					1000			
	00.0	1.5	1		도러			
	36.0		2 8		22	1	1	
			-				14	
					the second second			
			-		T BE			
	37.0				1	1		
					1.2.4			
	38.0		-			-	-	
			2		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1.	
			- 5 -					
			-					
		-	1.1	-				
	39.0							
		E.						
			- 11					
			2010	-				
	40.0		1					
	-0.0		1					
			100	-				
	410		- 5					
	41.0]		
			100					
					The second second		7	
				-				
				-				
		2	1.1					
	42.0					1		
			+,					
) I Com	1	200			X	
		18	7. E					
		1	1 (m m	ALL PROPERTY.			A	
	43.0		1.14			1		
				1.1				
		× 1	-	=				
		1.12						
		8		Transfer State		1		

				22.000	5.00					
	44.0				112			-		
				. 3	11 15					
					3					
			-		13 51					
				N	1.14	2.02				
			$\gamma = \sqrt{2}$						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	45.0									
					15					
				-						
						1			~	
	46.0				1 50					
	40.0		2	-		12		1		
					-1					
				1.1.1	1 12					
				-						
					-5-5-5	-			1	
	47.0				- 11					
			1	-	- 201					
				7	1.5					
				1	1				-	
	48.0			1	101					
	40.0				1.1.1					
					1.00					
					1000					
				1						
					1					
	49.0									
			5		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.					
					1000					
					1000					
					÷.					
	50.0		4		1.0					
	00.0				- 12					
					1.000					
			2		-				14	
					1 2 2					
					10.00					
	F4 0				1.1					
	0.10		NT.	1 K K		The second		1		
				-		1				
				-	-					
			· . = .	- 14						
						-				
	52.0		10)							
				1					And I have been a second	
			A COLORED		-					
			1 -	-	To a start					
	53.0		28.		1.035				- 5 m	
					1.1.1					
					1023					
									100 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
				14/24	1.43					
	F (A)			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Section 1					
	54.0		The second		3/1 (20)			1		
			-	-			_			
			and the second second	and the second second	The state	-			Provide	
						-				
									alt in	
			1						1	

FF A						
55.0						
56.0			- K		+ 1	
			ar and a second			
57.0			1		5	
					- 4-	
58.0						
50.0						
39.0						
60.0						
 61.0					-	
62.0						
63.0						
 64.0						
65.0	1					
			118			









85.0	
90.0	
Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **707.61** Top of PVC Casing Elevation (feet, NAVD188): **710.94**

WELL CONS	TRUCTION LOG	Southern Company Generatio	n
PROJECT:	CCB Disposal	DRILLING Boart Longyear	WELL
	•	DRILLER: Boart	NAME
LOCATION:	Bowen	RIG TYPE: RotoSonic	
LOGGER:	G. Dyer	DRILLING METHODS: RotoSonic	GWA-43
DATE CONSTR	UCTED: 5/25/2011		
		DEPTH	ELEVATION
NOT APPLICAE	BLE:	FEET	FT, NAVD88
Locking Hinged	Тор		
		TOP OF RISER 3.33	710.94
1/4-inch Vent		2" Threaded Riser Cap	
1/4-inch Weep ⊦	lole		
2-ft x 2-ft concre	te pad		
		GROUND SURFACE 0.00	707.61
		PROTECTIVE CASING	
		SIZE: 4x4-inch	
		TYPE: Anodized Aluminium	
		BOTTOM OF PROTECTIVE CASING	
		BACKFILL MATERIAL	
		AMOONT.	
		RISER CASING	
		DIA [·] 2-inch	
		TYPE Schedule 40 PVC	
		JOINT TYPE: Flush Threaded	
		TOP OF SEAL 75.90	631.71
		ANNULAR SEAL	
		TYPE: Hole Plug 3/8"	
		Bentonite Pellets	
		AMOUNT: 3.25 bags	
		PLACEMENT: Free fall	
		TOP OF FILTER PACK 77.90	629.71
		FILTER PACK	
		TYPE: DSI Sand - 2A (20/30)	
		AMOUNT: 2 bags	
		PLACEMENT Tremie; wash with water	
			007.74
		SODEEN	027.71
		TYPE: Schedule 40 PVC	
		OPENING WIDTH: 0.01-inch	
		OPENING TYPE: Slotted	
		SLOT SPACING: 0.25-inch	
		SLOT LENGTH:	
		BOTTOM OF SCREEN 89.90	617.71
Flush-threaded e	end cap		1
		BOTTOM OF CASING 90.20	617.41
	-		
	HOL	E DIA: 6"	

				Log updated with	revise	ed surve	ey certi	fied 3/23/2	021	
			1	Top of PVC Casing	evatio g Eleva	on (feet, ation (fe	NAVD eet, NA	VD88): 707.6 VD88): 710).94	BORING GWA-43
	S	DUT	HERN	LOG O	F TE	ST B	ORIN	NG		PAGE 1 OF 3
	6		COMPANY				•••••			
	SO		RN COMPANY SERVICES, INC.	ENGINEERING	PR		Monitori Plant B	ng Wells		
_					LO	CATION		owen		
AL.GP	DATE	STAR	COMPLET	ED <u>5/25/2011</u> SU	RF. EL	. EV . 707	7.61' NA	VD88 COOR	DINATE	S: N:1504129.20 E:2070982.44
R BOR			OR Boart Longyear	EQUIPMENT _	CUE		F HOD	Rotosonic		READING
SS FOI	BORI	NG DE	EPTH 92.5 ft. GROUND V	VATER DEPTH: DURIN	_ CHE		COMP.			ED
EL LO	NOTE	s_w	ell installed. Refer to well data sh	neet.						
LOGS/MONITORING WE	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCI	RIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
TABASE.GDT - 1/27/12 15:36 - T:\ESEE MAJOR PROJECTS\PROJECTS\PROJECTS\BOWEN\2011\ES2042_ B4G HOUSE UNITS 1-4\DATAIA\DATAI	5 10 15 20 25 30		 Clayey Silty Sand; Brown; v crystalline calcite clasts; upp organics; damp Silty Sand; Brown-red; with subrounded to subangular do clasts, dolomite is more high Gravelly Sand; Red to brow composed of subangular to s calcite and sparse chert; dan Less Gravel Sand is more coarse Sandy Gravel with clay; red banding or lamination; bleacl sedimentary structure slightly is dolomite and calcite; suba Silty Clay with pebble sized calcite/dolmite clasts; yellow- 	vith few subangular, er 1' contains prevalent blomite and calcite ly weathered, damp rn; Gravels are subrounded dolomite, np ; compositional ning zone or relict / intact; moist; gravel ngular to subrounded chert and -red; damp	701.6 684.6 681.1					
GEOTECH ENGINEERING LOGS - ESEE D	35		- Clay; yellow-red, mottled to weathering of chert and carb plasticity; damp	white due to onate material; low	675.6					



LOG OF TEST BORING

BORING GWA-43

PAGE 2 OF 3

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Monitoring Wells

	EAF	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	owen		
LUGS FUR BURAL.GFJ	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			(con't) - Sandy clay with prevalent zones of weathered chert; mottled tan, white and yellowchert is white; moist						
DA I A\BURING LUGS			- Sandy clay to clayey sand with prevalent subrounded to subangular fragments and chert and calcite; mottled tan, white and yellow; damp						
	55								
WEN\Z011\ESZ042_B	60		- SAA: higher moisture content, larger dolomite,						
יטיםיט וישרטאלוט=			chert and calcite fragments; soil contains non- parallel banding (black)						
			- SAA: more silt	639.1					
CI/17 - 00:01 71/17	70		 Sandy gravel with some silts; mottled tan, orange and white; wet; gravel is subangular chert and dolomite 						
י וח <u>פ</u> רו.	75		- Silty Clay; tan and orange; low plasticity; damp	633.6					
AIABASE			- Silty clay; tan and orange; low plasticity; damp						
הי באבב הי	80								
GINEERING L									
	85		- Gravelly, sandy clay; brown and tan; moist;	622.6					
ų		///	gravels are composed of weathered chert and						

			1						BORING GWA-43
	SC	DUT		OF TE	ST B	ORII	NG		PAGE 3 OF 3
	SOL	JTHER	N COMPANY SERVICES. INC.	PR		Monitor	ing Wells		
	EAF	RTH SC	EIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant E	Bowen		1
LOGS FOR BORAL.GPJ	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
· MELL			dolomite (con't)						
	90			615.6					
LOGS -			Bottom of borehole at 92.0 feet.	015.0		1	1		Bottom of hole.
DNINOS	95								
11S 14									
USE UN	100								
SAG HU									
- 11/EX	105								
- NEN									
OH4/S	110								
- HOUEC		-							
	· · · · · · · · · · · · · · · · · · ·								
≥ ⊔ ⊔ ∪	115								
95:0									
1. 21/12	120								
- 119 - I		1							
ABASE.									
	125								
ר במ פמ - במ									
ING LO									
GINEEN	130								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **707.80** Top of PVC Casing Elevation (feet, NAVD88): **711.19**

WELL CONSTRUCTION LOG Southern Company Generation										
PROJECT:	CCB Disposal	DRILLING Boart Longyear		WELL						
	Power	DRILLER: Boart		NAME						
LOCATION:	D Brooks	DRILLING METHODS' RotoSonic		GWA-43R						
DATE CONSTRU	JCTED: 5/24/2011									
			DEPTH	ELEVATION						
NOT APPLICAB	LE:		FEET	FT, NAVD88						
Locking Hinged T	Гор									
		TOP OF RISER	3.39	711.19						
1/4-inch Vent										
2-ft x 2-ft concrete	e pad									
		GROUND SURFACE	0.00	707.80						
		PROTECTIVE CASING								
		SIZE: 4x4-inch								
		I YPE: Anodized Aluminium								
		BOTTOM OF PROTECTIVE CASING								
		BACKFILL MATERIAL								
		TYPE: Portland Cement								
		AMOUNT:								
		RISER CASING								
		DIA: 2-inch								
		TYPE: Schedule 40 PVC								
		JOINT TYPE: Flush Threaded								
		TOP OF SEAL	62 20	645 60						
		ANNULAR SEAL	02.20	0.0.00						
		TYPE: Hole Plug 3/8"								
		Bentonite Pellets								
		AMOUNT: 2 bags								
		PLACEMENT: Free fall	111 70	506 10						
		FILTER PACK	111.70	390.10						
		TYPE: DSI Sand - 2A (20/30)								
		AMOUNT: 7 bags								
		PLACEMENT Tremie; wash with water								
		BOTTOM OF RISER / TOP OF SCREEN	113 70	594 10						
		SCREEN								
		DIA: 2-inch 10ft U-Pack								
		TYPE: Schedule 40 PVC								
		OPENING WIDTH: 0.01-inch								
		SLOT JE ACING. 0.25-IICH								
		BOTTOM OF SCREEN	123.70	584.10						
Flush-threaded e	end cap									
		BOTTOM OF CASING	124.20	583.60						
	н	DLE DIA: 6"								

		Log updated with re Ground Surface Elev	evised vation	survey (feet, N	certifie IAVD88	ed 3/23/2021 3): 707.80	1]
	0.117	Top of PVC Casing E	levati	on (fee	t, NAVI	D88): 711.19	•	BORING GWA-43R PAGE 1 OF 3
	001	COMPANY LOG O		SIE	SORI	NG		
s	OUTHEF	RN COMPANY SERVICES, INC.	PR	OJECT	Monitori	ing Wells		
E/	ARTH S	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant E	Bowen		
		RTED 5/24/2011 COMPLETED 5/25/2011 SU	IRF. EL	EV. 70	7.80' NA	VD88 COORD		S: N:1504117.39 E:2070973.14
CON	ITRACT	OR Boart Longyear EQUIPMENT		ME		Rotosonic	_	
	LLED B	YLOGGED BYD. Brooks		CKED B	۲		ANGLE	BEARING
BOF	RING DE	EPTH 127 ft. GROUND WATER DEPTH: DURIN	G		COMP.		DELAY	′ED
NOT	ES W	/ell installed. Refer to well data sheet.						
DEPTH (#)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM)	700.0					
		Clayey Sand (SC)	/06.3					
- -		- red, damp, fine grain, with chert fragments						
5								
			699.8					
5 1 1 1 1		Silty Sand (SM)						
10		- red, damp, fine to medium grain, with pieces of chert and carbonate						
			694.8					
		Silt (ML)						
15		weathered carbonate	692.8					
· · · · · · · · · · · · · · · · · · ·		Lean Clay (CL) - mottled red and reddish yellow, damp, red sandy clay with lenses of reddish yellow silt						
20		Clayey Sand (SC)	088.8					
		- red, damp, fine to medium grain, with quartz and chert fragments						
		Lean Clay (CL)	685.8					
25		 mottled orange and red, moist, contains pieces of highly weathered carbonate; becoming more yellow-orange with depth 						
		- CL: mottled yellow-orange and white and red.						
		moist, very fine grain, with sand; lenses of weathered carbonate						
30								
í		- SAA with lenses of carbonate increasing in						
		prominence						
35	-///							
			670.8					
5		Silt (ML)						
		sand and weathered chert						
<u>40</u>			667.8		1			

(Continued Next Page)



LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT Monitoring Wells

	EAR	TH SO	CIENCE AND ENVIRONMENTAL ENGINEERING	LO	CATION	Plant B	Bowen		
	UEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			Silty Sand (SM) - mottled black, orange, red and white, fine to medium grain, with chert fragments	663.8					
	45		Lean Clay (CL) - yellow-orange, damp, low plasticity						
140 140	50			050.0					
ທີ N			Clayey Sand (SC)	656.8					
			- mottled orange and yellow, red and black, moist, fine to medium grain, with chert	653.8					
	55		Lean Clay (CL)						
45 			- reddish yellow, moist, no to low plasticity, with sand						
011/ES20			- black, tan and reddish yellow						
NEN/2	60								
SOJEC			- light brown						
				643.8					
	65		Clayey Sand (SC)						
Жд Ж		<u>:/::</u> /	grain, with chert	641.8					
			- Dolostone	640.8					
			- Cavity						
	70								
. 5:36									
. 112									
-									
	75								
VBASI		V							
		X							
		Λ							
 	80								
۲ وا									
NGIN									
E E	85								
EOTE									

	LOG OF TEST BORING								
E	Sout	HERN H SCII	COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENGINEEF	PR RING LO	OJECT	<u>Monitori</u> Plant B	ing Wells Bowen		
LOGS FOR BORAL.GPJ DEPTH	(ft) GRAPHIC	LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COM
	0 		(con't)						
HOUSE UNITS 1-4/DATA/BORING LOG	5 								
2042_BAGH	· · · · · /		- Dolostone	605.8					
011/ES	15	$\overline{\mathbf{X}}$	- Cavity	602.8					
R PROJECTS/PROJECTS/BC	0		- Dolostone						
/12 15:36 - T:\ESEE MAJOI	5								
EE DATABASE.GDT - 1/27	20								
EERING LOGS - ESE			Bottom of borehole at 127.0 fe	581.8 eet.					Bottom of Hole.
GEOTECH ENGINE	<u>80</u>								

BORING GWA-43R PAGE 3 OF 3

COMMENTS





Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **710.15** Top of PVC Casing Elevation (feet, NAVD188): **712.89**

sou	THERN	DRILLI	NG L	.OG			Hole No.	GWC-4	4
Energy	COMPA to Serve Your V	NY GEOLOGIC	AL SE	RVICES			Sheet 1	of 4	
SITE _		Plant Bowen			HOLE DEPTH	86	SURFELEV	710. <u>15' NA</u>	VD88
LOCAT	ION	Landfill Cells 9 &10	COORI	DINATES	150443	6.66	2	071414.30	
ANGLE		BEARING	CONTR	ACTOR	Boart	D	RILL NO.		
DRILLI	NG METHOD	Rotosonic NO. SAMPLE	s		NO. U	.D. SAMPL	ES		
CASING	G SIZE	2"LENGTH10'	co	RE SIZE			% REC.		
WATEF	R TABLE DEPTH	58.55'ELEV654.34T	ME AFTE	R COMP.		DAT	E TAKEN	8/25/2014	
TYPE G	ROUT	QUANTITY	N	IIX	DRI	LING STA	RT DATE	6/9/2011	
DRILLE	R	RECORDER Dyer / Abraham APPRO	OVED		DRI	LING COM	/IP. DATE	6/9/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	710.15								
1		SILTY SAND (0 - 8 FT)							
2		Red to reddish-brown, moderately-cemented silty sand with minor angular gravels; damp.							
3									
4									
5	705 15								
6	700.10								
0									
8									
9									
10	700.15								
11									
12									
13									
14									
15	695.15								
16									
17		SANDY SILT (8 -18 FT)							
18		rare gravels; contains angular to sub-angular nodular							
19		chert; poorly cemented; slignity damp.							
20	690.15								
21									
22									
23		CLAYEY SILT (18 - 24 FT) Tan-yellow to white clayey silt with rare gravels;							
24	686.15	predominanty silty hardened soil with no structure; slighty damp.							

SOUTHERN A DRILLING LOG								WC-4	Hole No. GWC-44			
Energ	COMP y to Serve You	GEOLOGIC	AL SE	RVICES			Sheet 2 of	4				
SITE _		Plant Bowen			TOTAL DEPTH	86	SURF.ELEV. 7	10.15' NA	VD88			
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD			
25	685.15											
26												
27												
28												
29												
30	680.15											
31												
32												
33												
34												
35	675.15											
36												
37												
38												
39												
40	670.15											
41												
42												
43												
44												
45	665.15											
46												
47												
48												
49												
50	660.15											
51												
52												
53	<u> </u>	1 AVEY SILT (24 - 56 ET)										
54		an-yellow to white, silty clay to clayey silt; clay aries from 15 to 30% minor gravel										
55	655.15 V	and nom to to out, minor graver.										
1			1					1				

sou	THERN	DRILLI	Hole No. GWC-44						
Energy	COMP	any GEOLOGIC	AL SE	RVICES			Sheet 3 of	4	
SITE _		Plant Bowen			TOTAL DEPTH	86	SURF.ELEV. 71	10.15' NA	AVD88
			Sample	Stan	dard Danatratian Taat				
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
56	654.15								
57									
58									
59									
60	650.15								
61									
62									
63									
64									
65	645.15								
66									
67		Tan silty clay to low-plasticity clay; few dolomitic							
68		nagments, very damp.							
69									
70	640.15								
71									
72									
73		SILT (67 - 74 FT)							
74		Tan to light yellow silt with minor sand; gravel absent;							
75	635.15	SANDY GRAVEL							
76		Tan yellow, low plasticity, sandy gravel with some clay; moist to wet.							
77									
78									

79 631.15 Form GS9901 7-26-2004

sou	THERN	DRILI	LING L	OG			Hole No.	GWC-4	4	
Energy	COMP	r World" GEOLOGI	CAL SE	RVICES			Sheet 4 c	Sheet 4 of 4		
SITE		Plant Bowen		TOTAL DEPTH			SURF.ELEV.	710 <u>.15'</u> NA	VD88	
	1	[Sampla						1	
Depth	Elev.	Material Description, Classification and Remarks	No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD	
80	630.15									
81										
82										
83										
84										
85	625.15	SANDY GRAVEL (74 - 86 FT) Tan yellow, low plasticity, sandy gravel with some								
86	624.15	clay; wet. BOTTOM AT 86-FT								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **698.41** Top of PVC Casing Elevation (feet, NAVDI88): **701.53**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **698.41** Top of PVC Casing Elevation (feet, NAVD188): **701.53**

sou	THERN	<u>A</u>	DRILLIN	G L	OG			Hole No.	GWC-45	
Energy	COMP to Serve You	ar World*	GEOLOGICAL	SEF	RVICES			Sheet 1 of	3	
SITE _		Plant Bowen Dry Gypsun	n Storage Facilit	y		HOLE DEPTH	64.3	SURF.ELE	/698	.41
LOCAT		Cells 1 & 2		COORD	INATES N	1504539	9.38	E20	71956.71	
ANGLE		0 BEARING	0 0	CONTR	ACTOR	SCS	D	RILL NO.	ME 75	
DRILLIN	NG METHOD	HSA	NO. SAMPLES		13	NO. U.	D. SAMPL	ES	0	
CASING	SIZE	4/4 ID 7" OD LENGTH		COF			TOTAL	% REC.		
WATER	TABLE DEI	PTH ELEV	TIME	E AFTEI			DAT	E TAKEN		
TYPE G	ROUT	QUANTITY	JANTITY		x	DRIL	LING STA	RT DATE5/	16/2007	
DRILLE	R	S. Denty RECORDER L. Mi	illet APPROVE	ED		DRIL	LING COM	IP. DATE 5/	16/2007	
Depth	Elev.	Material Description, Classification and	d Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	698.41									
1										
2										
3										
4										
5	693.41	Red silty CLAY, dry, firm, occasional pet	obles	S-1	4.5-6	3-5-7	12		75	
6										
7										
8										
9		Red silty CLAY, dry, firm, some tan mott	ling,	S-2	9.5-11.0	4-5-6	11		100	
10	688.41	occasional pebbles and coarse sand gra	ains							
11		•								
12		•								
12										
13				0.0	445400	11 10 00				
14		Same as above		5-3	14.5-16.0	11-16-20	36		100	
15	683.41									
16										
17										
18										
19										
20	678.41	Red CLAY, dry, firm, w/ silt, carbonate s	and, pebbles,	S-4	19.5-21.0	6-12-11	13		100	
21										
22		•								
23		•								
<u>2</u> 4	<u>674.</u> 41									

sou		DRILLI	NG L	.OG			Hole No. (GWC-45	
Energy	to Serve Yor	GEOLOGIC	AL SE	RVICES			Sheet 2 of	3	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	64.3	3 SURF.ELEV.	698	.41
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	673.41	Red & yellow orange CLAY, dry to damp, firm, carbonate pebbles and sand	S-5	24.5-26.0	3-4-4	8		90	
26									
27									
28									
29		Tan orange & dark red CLAY, dry, mottled firm, small	S-6	29.5-31.0	2-3-6	9		95	
30	668.41								
31									
32									
33									
34		Orange & tan silty CLAY, dry, firm to slightly plastic	S-7	34.5-36.0	3-3-6	9		100	
35	663.41	occasional small carbonate pebbles, coarse sand							
36		0.41							
07									
38									
39		Orange & light tan CLAY, dry, slightly plastic, small	S-8	39.5-41.0	2-3-5	8		100	
40	658.41	carbonate pebbles, coarse sand							
41									
42									
43									
44		Light tan & tan silty CLAY, moist, moderately soft,	S-9	44.5-46	2-2-3	5		100	
45	653.41	orange & black mottles, few pebbles and sand							
46									
47									
48									
49		Tan silty CLAY, moist, moderately soft, dark red and black	S-10	49.5-51	5-2-5	7		80	
50	648.41	mottles, pebbles and gravel							
51									
52									
53									
54		Tan silty CLAY, saturated, soft, many chert pebbles,	S-11	54.5-56	11-19-19	38		50	
55	643.41	carbonate sand							
56	642.41								

sou		DRILLI	NG L	.OG			Hole No.	GWC-45	
Energy	to Serve Yor	GEOLOGICA	AL SE	RVICES			Sheet 3 of	3	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	64.	3 SURF.ELEV.	698	.41
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
57	641.41								
58									
59		Tan clayey SILT, moist, moderately soft, sand pockets	S-12	59.5-61	4-5-7	12		100	
60	638.41								
61									
62									
63									
64		Top of rock							
65	633.41	64.3: Bottom of boring							
66									
67									
68									
69									
70	628.41								
71									
72									
73									
74									
75	623.41								
76									
77									
78									
79									
80	618.41								
81									
82									
83									
84	040.41								
85	613.41								
87									
88	610.41								

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **699.00** Top of PVC Casing Elevation (feet, NAVDI88): **702.02**



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **699.00** Top of PVC Casing Elevation (feet, NAVD188): **702.02**

sou	THERN	DRILL	NG L	OG			Hole No.	GWC-45F	२
Energy	to Serve You	ir World GEOLOGIC	AL SE	RVICES			Sheet 1	of 5	
SITE _		Plant Bowen Dry Gypsum Storage Faci	lity		HOLE DEPTH	129.2	SURF.EL	EV. 699	9.00
LOCAT		Cells 1 & 2	COORI	DINATES N	1504538	8.68	E 207194		
ANGLE		0 BEARING 0	CONTR		SCS	D	RILL NO.	CME 75	
DRILLI	NG METHO	D HSA/HQ rock core with water NO. SAMPLE	NO. SAMPLES17		NO. U.D. SAMPLES		ES	0	
CASING	G SIZE	LENGTH	cc			TOTAL	% REC.		
WATEF	R TABLE DE	ELEV T	ME AFTE	R COMP.		DAT	E TAKEN		
TYPE G	ROUT	QUANTITY	N	1IX	DRIL	LING STA	RT DATE	5/17/2007	
DRILLER S. Der		S. Denty RECORDER L. Millet APPR	OVED _		DRIL	LING COM	IP. DATE	5/17/2007	
Depth Elev.		Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	699.00								
	000.00		1						
1									
2									
3									
4		Red silty CLAY, dry, firm, tan mottling, small pebbles	S-1	4.5-6	3-3-4	7		100	
5	694.00	and occasional roots							
	001.00								
6									
7									
8									
9		Red silty CLAY, dry, firm, some coarse sand grains	S-2	9.5-11.0	4-4-6	10		100	
10	689.00								
11									
12									
10									
13									
14		Red silty CLAY, dry, firm, small to medium chert & carbonate pebbles	S-3	14.5-16.0	5-6-9	15		100	
15	684.00								
16									
17									
18									
10		Red CLAY dry hard some silt occasional carbonate	S-4	19 5-21 0	6-11-17	28		100	
13	070.00	pebbles		10.0 21.0	V-11-17			100	
20	679.00	4							
21		4							
22									
23									
24	675.00								

sou	THERN	ANY		.OG			Hole No. G	WC-45F	2
Energy	to Serve Yos	ur World GE	OLOGICAL SE	RVICES		129	Sheet 2 of	5	
SITE -			Sample	Stan	dard Penetration Test	125	SURF.ELEV.	699	.00
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
25	674.00	pebbles	nen 5-5	24.5-26.0	5-7-11	10		100	
26									
27		-							
28		-							
29		Brown and orange silty CLAY, dry, firm, degrade	d S-6	29.5-31.0	5-7-12	19		100	
30	669.00	carbonated peoples and cooples							
31									
32									
33									
34		Tan silty CLAY, moist, firm, small degraded carbo	onate S-7	34.5-36.0	3-4-5	9		100	
35	664.00	pebbles and coarse sand							
36									
37									
38									
39		Orangish tan CLAY, moist firm, chert and carbo	nate S-8	39.5-41.0	5-5-7	12		100	
40	659.00	sand and pebbles, black and light brown mottling						100	
41									
42									
43									
44		Orange and light tan CLAY, dry, firm, black mottl	ing, S-9	44.5-46	5-7-9	16		100	
45	654.00	occasional carbonate pebbles, some silt.							
46									
47		1							
48									
49]	S-10	49.5-51	2-3-4	7		100	
50	649.00	Tan clayey SILT, moist, moderately firm to mode	rately						
51		soft, black and dark red mottling							
52]							
53									
54		Tan clayey SILT, moist, moderately soft, degrade	ed S-11	54.5-56	8-7-8	15		100	
55	644.00	carbonate cobbies, black mottling , some sand							
56	643.00								
Form GS	S9901 7-26-2	2004							

sou	COMP	DRILLI			Hole No. G	WC-45F	٤		
Energy	to Serve You	rr World GEOLOGIC/ Plant Bowen Dry Gypsum Storage Facility	AL SE	KVICES		129	Sheet 3 of	5	46
SITE -		· · ····· - · · · · · · · · · · · · · ·	Sample	Stan	dard Penetration Test		SURF.ELEV.	099	.40
Depth	Elev.	Material Description, Classification and Remarks	No.	From To	Blows	N	Comments	% Rec	RQD
57	642.00								
58									
59		Tan clayey SILT, w/ sand, saturated, soft, carbonate	S-12	59.5-61	8-50-1	R		50	
60	639.00	cobble in bottom of spoon							
61		60.8: Core through 8" boulder							
62									
62									
03									
64		ran silty SAND, saturated, loose, medium-coarse grained w/ pebbles and gravel	S-13	64.5-66	3-1-4	5		50	
65	634.00								
66									
67									
68									
69									
70	629.00	Tan clayey SILT, saturated, soft, some black & orange mottling	S-14	69.5-71	2-3-4	7		10	
71									
72									
72									
- 13									
/4									
75	624.00								
76		No recovery	S-15	74.5-76	3-3-4	7		0	
77									
78									
79									
80	619.00								
81		Tan silty CLAY, soft, saturated	S-16	79.5-81	3-3-4	7		30	
82									
83									
84			1						
<u>8</u> 5	614.00								
86		Same as above	S-17	84.5-86	9-11-12	23		5	
87			1						
88	611.00	1							

sou	THERN	DRILLI	NG L	.OG			Hole No. G	WC-45F	२
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 4 of	5	
SITE _		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	129.2	2 SURF.ELEV.	699).00
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
89	610.00								
00									
90									
91									
92									
93									
94									
95	604.00	95.1: Start coring	1						
96		filled w/ white mineralization.							
97		96.7-102.2: Cavity							
98									
00									
100	500.00								
100	599.00								
101									
102									
103		102.5-105.1: Cavity							
104									
105	594.00								
106									
107		Same as above							
108									
109									
110	589.00								
111	000.00								
112									
113									
114	504.00								
115	584.00		1						
116			1						
117									
118			1						
119			1						
120	579.00	119.5-122.5: Cavity							

sou	THERN	DRILLI	NG L	.OG			Hole No. G	WC-45F	र
Energy	to Serve You	r World GEOLOGIC	AL SE	RVICES			Sheet 5 of	5	
SITE -		Plant Bowen Dry Gypsum Storage Facility			TOTAL DEPTH	129.	2 SURF.ELEV.	699	.46
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
121	578.00								
122									
123									
124									
125	574.00	124.1-129.2: Cavity							
126									
127									
128									
129									
130	569.00	129.2: Bottom of boring							
131									
132									
133									
134									
135	564.00								
136									
137									
138									
140	559.00								
141									
142									
143									
144									
145	554.00								
146									
147									
148									
149									
150	549.00								
151									
152									
153	546.00							/	

		Log updated with revised survey certifi Ground Surface Elevation (feet, NAVD8	ed 3/23/202 8): 687.94	1	
		Top of PVC Casing Elevation (feet, NAV	/DI88): 690. 4	19	BORING GWC-46 R PAGE 1 OF 1
20	501	COMPANY LOG OF TEST BOR	RING		<u>GPC353387</u>
so	UTHE	RN COMPANY SERVICES, INC. PROJECT <u>Moni</u>	toring Wells, C	ell No. 9	
EAI	RTH S	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	nt Bowen		
		TED <u>8/14/2014</u> COMPLETED <u>8/15/2014</u> SURF. ELEV. <u>687.94'</u>	<u>NAVD88</u> COC		S: N:1504522.23; E:2072184.47
DRILI	LED B	D. Wilcox LOGGED BY W. Shaughnessy CHECKED BY		ANGLE	BEARING
BORI	NG DE	PTH _56.5 ft GROUND WATER DEPTH: DURING COM	P		ED _32 ft. after 24 hrs.
NOTE	S				
			Z		
	<u>ں</u>		ATEF ONS		WELL DATA
(ff)	LOG	MATERIAL DESCRIPTION		Comple	etion:
	с В С П С П		erate OUN SER	2-foot s	ive aluminum cover with bollards; square concrete pad
		(01)	OGR Stro		Surface Seal:
		- CLAY (CL), wet, red-yellow to yellow			
		- CLAY (CH), yellow with red motiles - gravelly CLAY (CH), wet, yellow with red and black mottling			
10	_				
		 gravelly CLAY (CH), wet, brown-yellow with black mottling, cobbles, lesser gravel downward 			Annular Fill:
20	_	some gravel			cement-bentonite grout
		(COBBLES AND BOULDERS)			
30	_	- DOLOSTONE boulder, cobbles, pulverized rock, dry, white			
		· · · · · · · · · · · · · · · · · · ·			
		(COBBLES AND BOULDERS)	-		
10		- DOLOSTONE, cobbles, pulverized rock, dry, white and light gray			Annular Seal:
	1	- DOLOSTONE, light gray and dark gray, some iron staining, no HCl	-		dentonite pellets
		reaction, thin calcite veins			Filter:
					silica filter sand
		- DOLOSTONE, light gray and gray, iron staining, no to low HCl reaction,		旧目	
50		calcite veins			Standpipe:
					2" OD PVC (SCH 40) Screen:
				目目	10 ft; pre-pack
					Sump 0.4 ft
		Bottom of borehole at 56.5 feet.			<u></u>
60					

Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **687.44** Top of PVC Casing Elevation (feet, NAVD188): **690.86**



PROJECT		000 122160287.2101 Bowen	GWC-47 BORING LOG	Log updated with revised Ground Surface Elevation Top of PVC Casing Elevat COORDINATES COORD SYS Ga	survey certifie (feet, NAVD8 ion (feet, NAV N 1504543.69, E	ed 3/23/2021 8): 687.44 DI88): 690.86 072481.34 t (NAD 83)
CLIENT GO ADDRESS LOCATION	eorgia Power 317 Covere I Gypsum La	d Bridge Rd SW Indfill Cells 1 & 2	RIG TYPE/ METHOD N/A Casing dia. N/A Boring Depth N/A	COMPLETION S SURFACE ELEV WELL TOC 690.	tick-up w/ protecti ATION 687.44 ft a 86 ft amsl	ve casing amsl
GWC-47R	S Lithologic (previously G	descriptions are thos WC-46R) drilled on 4	e recorded for the installation of neighbor /22/2014 and completed on 4/24/2104.	ing well LOGGED BY N/A CHECKED BY A.	Shoredits & R. Qu	uinn
Depth (ft)	Graphic Log		Material Description		NSCS	Elevation (ft)
-4-6-8-		Silty CLAY, orange v weathered rock frag	v h red and yellow mo ng, medium stiff, ments	mo st, res duum & partially	L-ML	698 696 694 692 690
10 12 14 16 18 20 22 24 26 28 30 32 32 34		SILT with clay, orang residuum Partially weathered of Trace sand 20-35 ft	ge/ yellow with red/ brown/ orange/ yellow	mottling, medium stiff, moist,	ML	688 686 684 682 680 678 676 674 672 670 668 666 666 664
36 38 40 42 44 46 48		Silty CLAY, orange v SILT with clay, orang with increasing dept throughout	vith red and yellow mottling, stiff, wet, san ge with red/ brown/ yellow/ light grey mott h, moist, residuum & partially weathered i	ds present ing, going from very soft to stiff ock fragments, trace sand	CL-ML ML	662 660 658 656 654 652 650

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 15 Apr 2021

WOOD. GWC-47 BORING LOG

Depth (ft)	Graphic Log	Material Description	RSCS	Elevation (ft)
-50				648
52				646
54				644
56		Chert lens, grey unweathered No sample	N/A	642
58				640
60	///////////////////////////////////////	Sandy CLAY, orange with red mottling, very soft, moist, silt laminations	CL-SC	040
62				- 638
64				- 636 -
66		Dolomite, grey, hard, slightly to moderately weathered, slightly to moderately decomposed with		634
-68				632
70		Boring terminated @ 68.0 ft		630
72				628
74				626
/4				624
76				622
- 78				620
80				618
82				616
- 84				614
86				014
88				612
90				610
92				- 608
94				606
96				604
98				602
100				600
100				598
- 102				596
104				594
106				- 592
108				

Disclaimer This bore log is intended for environmental not geotechnical purposes. produced by ESlog.ESdat.net on 15 Apr 2021

Optical Teleview Magnetic North and 3D Image GWA-47

Depth	1	Image-NM GWA	-47	creen Int./Water Leve	GWA-47 3D
1ft:15ft	0°	90° 180°	270° 0°	0 1	-0°
7.0					Pipe Joint (7.6')
8.0		3			
9.0					
10.0					
11.0					
12.0					
14.0					
15.0				-	
16.0					
		-			







Page 4



Borehole inundated with dark material growing on sidewalls. In order to view bettter exposure and light were turned up.



Depth	Image-N	NM GWC-47	cr	een Int./Water Leve	GWC-47 3D	
1ft:100ft	0° 90°	180° 270°	0° 0) 1	-0°	
	GW	C-47 GR				
	0	CPS	250			
5.0		MAN				
10.0		MMM				
15.0		myMm				
20.0		MM				
25.0		TANA				
30.0		MMM			1.4 E	
35.0		MM			1000	
40.0	Mr.					
45.0	V-MAAMM-1					
50.0	W					
55.0	A Martin					
60.0						
65.0						

GWC-47 Gamma			Depth		
0	CPS	250	1ft:200ft		
			5		
			10		
			10		
			15		
			20		
			25		
			30		
	Bentonite	Frout	05		
	5' - 50'	51040	35		
	Water ~42'		40		
			45		
			50		
	Bentonite Seal 50' - 55'				
	Filter Sand 55' - 57'		55		
	Screen 57' - 67'		60		

_		Log updated with revised Ground Surface Elevation Top of PVC Casing Elevation	BORING GW	C-47R				
so		LOG OF TEST AND WELL INS	BOR TALL/	ATIO	G ON		PAC <u>E</u>	3E 1 OF 2 CS18611
SOU.	THERN COMPANY SERVICES, INC.	PROJEC	CT <u>9&1</u>	0 Lan	dfill V	Vells		
EARI	I H SCIENCE AND ENVIRONMENT.	AL ENGINEERING LOCATI	ION Plan	IT BOW	en			
DATE S	STARTED 4/22/2014 COMPLETE	D 4/24/2014 SURF. ELEV.	687.71' 1	NAVD	88 C	OORDINATES:	N:1504539.25 E:2072	2467.10
CONTR	ACTOR Tristate Drilling	EQUIPMENT CME550	METHOD	Holl	ow S	tem Auger; Casing	Advance; HQ Rock (Core
DRILLE	D BY D. Wright LOGGED BY) BY <u>L. N</u>	<u>/illet</u>		ANGLE9	0 BEARING	0
NOTES						DELATED	55.45 ft. alter 192 fils	5.
UHC (#)	STRATA DES	SCRIPTION				WEL	L DATA	
RAP LOC					_	Protective steel c 4-foot square cor	cover hcrete pad	
۳ ۵						Top of casing Ele	ev. = 691.13	EL
	Silty Clay (CL-ML)		ELEV	• 53 v	- - - - - - - - - - - - - - - - - - -			(DEP
	 orange, moist, medium stiff, reside partially weathered rock fragments 	uum, silty, dark red mottling,		₹.		-Surface Seal: c	oncrete	685
								(2
S V V			682.7	,				
	Silty Clay (CL-ML)	hum silty red and vellow mottling						
	partially weathered rock fragments	dum, sity, red and yellow mouling	,					
<u>۲۲۲۱</u>	Silt (ML)		677.7					
	- orange, moist, medium stiff, <i>resid</i>	<i>uum</i> , clayey, red and brown						
	mouning							
12			672 7					
	Silt (ML)		0.2.					
	mottling, partially weathered rock f	ragments						
<u>5</u>	Silt (ML)		667.7					
	- yellow, damp, stiff, <i>residuum</i> , clay	vey, orange and yellow mottling,						
	partially weathered rock tragments	, trace sand						
52			662 7					
	Silt (ML)		002.1					
	- yellow, damp, medium stiff, <i>resid</i> mottling, trace sand	<i>Jum</i> , clayey, brown and orange						
<u></u>	Silt (ML)		657.7					
	- yellow, damp, stiff, <i>residuum</i> , clay	ey, brown and orange mottling,						
	trace sand							
22			650 7			 Annular Fill: Po 	rtland Cement Grout	
	Lean to Fat Clay (CL-ML)		002.1					
	- orange, wet, stiff, <i>residuum</i> , silty, places	red and yellow mottling, sandy in						
	Ţ							
6			647.7		\mathbb{Z}			


WELLS 2014\MW49-49R-47R.GPJ

LOG OF TEST BORING AND WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC. EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING PROJECT 9 & 10 Landfill Wells

LOCATION Plant Bowen

	(#)	ງ L ບ	STRATA DESCRIPTION		WELL DATA
	DEPTH				Protective steel cover 4-foot square concrete pad Top of casing Elev. = 691.00
¥.				ELEV.	.EV. (CONTINUED) (DEPTH)
UPPURI URILLING	15		Silt (ML) - orange, very moist, soft, <i>residuum</i> , clayey, yellow and brown mottling, thin sand lenses	642 7	
	20		Silt (ML) - orange, very moist, very soft, <i>residuum</i> , clayey, red and yellow mottling, partially weathered rock fragments, few thin sand lenses	637.7	7.7
	55		Silt (ML) - orange, very moist, very hard, <i>residuum</i> , clayey, yellow and light gray mottling, partially weathered rock fragments, trace sand	632.7	
KGROUPS/APC GE	Z		(ML) - cored through sample interval - no recovery Chert - gray, not weathered, chert boulder	631.4	
	09		Lean to Fat Clay (CH) - orange, very moist, very soft, <i>residuum</i> , sandy, red mottling, thin silt lenses	627.7	7.7
	65			622.7	<u>2.7</u> 622.7 (65.0)
SOUTHER			Dolomite - gray, hard, slightly weathered, slightly decomposed, slightly fractured	620.7	0.7 ← Annular Seal: bentonite pellets
/14 10:42 - //	20		Dolomite - gray, hard, slightly weathered, slightly decomposed, slightly fractured Dolomite	617.9	7.9 Filter: silica filter sand (69.2) 616.9 (70.8)
GUI - 08/13	2		- gray, hard, slightly to moderately weathered, slightly decomposed, slightly fractured	612.0	Well: 2" OD PVC (SCH 40)
2012UA I ABASE		/	Dolomite - gray, hard, slightly weathered, slightly decomposed, slightly fractured		Well: 2" OD PVC (SCH 40)
- EVEE	80	/	Delomito	607.9	7.9
IH WELL	-		- gray, hard, slightly weathered, moderately decomposed, slightly fractured	606.5	6.5 Sump:0.40 ft.
2012 GEO LECH LOG WI			Bottom of borehole at 81.2 feet.		



Log updated with revised survey certified 3/23/2021 Ground Surface Elevation (feet, NAVD88): **686.20** Top of PVC Casing Elevation (feet, NAVD188): **688.33**

sou	HERN	DRILL	NG L	.OG			Hole No.	GWC-	48
Energy 1	COMPAN to Serve Your Wor	GEOLOGIC	AL SE	RVICES			Sheet	1 of 2	
SITE _		Plant Bowen			HOLE DEPTH	57'	SUF	FELEV 686.2	0 FT
LOCAT	ION	Landfill Cells 9 &10	COORI	DINATES	150449	0.63		2072851.71	1
ANGLE		BEARING	CONTR	ACTOR	Boart	D	RILL NO.		
DRILLIN	IG METHOD	Rotosonic NO. SAMPLE	s		NO. U	.D. SAMPL	ES		
CASING	S SIZE	LENGTH 10'	co	RE SIZE			% REC.		
WATER	TABLE DEPTH	39.73 FT ELEV. 648.76 FT T	ME AFTE	R COMP.		DAT	E TAKEN	8/25/2014	
TYPE G	ROUT	QUANTITY	N	IIX		LING STA	RT DATE	6/8/2011	
DRILLE	R	RECORDER Dyer / Abraham APPRO	OVED _		DRIL	LING COM	IP. DATE	6/8/2011	
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Stan From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
0	686.20								
1		CLAYEY SILT (0 - 3 FT)							
2		White to tan and orange, weakly-cemented, clayey silt; few dolomitic fragments; dry.							
3		SILTY SAND (3 - 8 FT)							
4		angular to sub-angular gravels; dry.							
5	681.20								
6									
7									
8		CLAYEY SILT (8 - 16 FT) Tan to white clayey silt with few gravels; dark colored							
9		panding - likely manganese bands with contorted bedding; moist.							
10	676.20								
11									
12									
13									
14									
15	671.20								
16									
17		Brownish gravelly sand with wet clay layers; Low							
18		plastic clay.							
19									
20	666.20								
21									
22									
23									
24	662.20								

Form GS9901 7-26-2004

		DRILLING LOG					Hole No. G	NC-4	8
		GEOLOGICAL SERVICES					Sheet 2 of	2	
SITE _		Plant Bowen			TOTAL DEPTH	57'	SURF.ELEV.	686.2	:0 FT
Depth	Elev.	Material Description, Classification and Remarks	Sample No.	From To	dard Penetration Test Blows	N	Comments	% Rec	RQD
25	661.20								
26									
27									
28									
20									
20	656 20	си т							
- 30	000.20	Tan to orange silt (70%) with clay (15%) and sandy							
31		graver (15%), low plastic clay, lacks structure, wet.							
32									
33									
34									
35	651.20								
36									
37									
38									
39									
40	646.20								
41									
42									
43									
44									
45	641.20								
46		SILT (46 - 50 FT) Tan to orange silt (70%) with clay (15%) and sandy							
47		gravel (15%); low plastic clay; lacks structure; wet.							
47									
40 40									
50	636 20	CLAYEY SILT (50 - 56 FT)							
51	000.20	Tan to orange silt (65%) with clay (20%) and sandy gravel (15%): low plastic clay: lacks structure; wet							
52									
52									
54									
55	631 20								
56	630.20	END OF BORING 57 FT							

Form GS9901 7-26-2004

so	DUT	Ground Surface Elevation (feet, NAVD88): 7 Top of PVC Casing Elevation (feet, NAVD18 LOG OF TEST BO	723/20 706.12 8): 709 RINC).11 G		BORING GWC-49 Z PAGE 1 OF <u>GPC63317</u>
SOU EAF	UTHE RTH S	RN COMPANY SERVICES, INC. PROJECT <u>Lan</u> CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION <u>Pla</u>	dfill Rep nt Bowe	lacement en	Monitoring	Wells
DATE CONT DRILI	E STAF TRACI	RTED 2/23/2016 COMPLETED 3/1/2016 SURF. ELEV. 706.12' FOR Cascade EQUIPMENT Tracked METHO Y T. Ardito LOGGED BY W. Shaughnessy CHECKED BY B.	NAVD8 D <u>Roto</u> Smelse	8 COOF sonic er	RDINAT <u>ES:</u> ANGLE	N:1505238.30 E:2072896.49 BEARING
BORI NOTE	NG DE	EPTH 107 ft. GROUND WATER DEPTHDURING 48 ft. COM	1P. <u>47</u>	3 ft.	DELAYEI	D_47.2 ft. after 96 hrs.
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Veak Aoderate HCL Strong	BROUNDWATER	Completi protectiv 4-foot sq	WELL DATA ion: e aluminum cover with bollards; uare concrete pad
5		Sandy Silt (ML) - mottled grayish brown (10YR 5/2), strong brown (7.5YR 5/6) and brownish yellow / dark yellowish orange (10YR 6/6) very damp, soft, some clay and gravel - medium stiff				_Surface Seal: Concrete
<u>10</u>		- mottled reddish yellow (7.5YR 6/8) and yellowish red (5YR 4/6) moist medium stiff, medium plasticity, some clay and gravel - stiff				Annular Fill:
15		Dolostone (COBBLES AND BOULDERS) - dolostone boulder, about 2 ft. thick, gray, fresh				Portland Cement-Bentonite Grout (4 - 94lbs bags PC, 1 - 50lbs bags Gel, 40 gal. Water
20		- mottled strong brown (7.5YR 5/8) and red (2.5YR 4/6) dry, medium stiff, medium plasticity, some clay and gravel - stiff				
25		- mottled brownish yellow (10YR 6/8) and red (2.5YR 4/8)				
30		Silt (ML) - mottled brownish yellow (10YR 6/8) and red (2.5yr 4/8) dry, medium stiff, low to medium plasticity, some sand - damp				Annular Seal
35						Pel-Plug 3/8 Bentonite Coated Pellets (0.5 - 5gal buckets (77.0'-74.0')) and Baroid Hole Plug 3/8 Chips (10 - 50lbs bag (74.0'-25.0'))
		Elastic Silt (MH) - mottled brownish yellow (10YR 6/8) and red (2.5YR 4/8) wet, medium stiff				



LOG OF TEST BORING

so	DUT	LOG OF TEST BOI	RINC	6		BORING GWC-49 Z PAGE 2 OF 3 <u>GPC633179</u>
SOU	UTHE	RN COMPANY SERVICES, INC. PROJECT Land	fill Repl	acement	Monitorin	ng Wells
EAF	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	nt Bowe	n	1	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	Weak Moderate Strong	GROUNDWATER DBSERVATIONS	Compl protect 4-foot	WELL DATA etion: ive aluminum cover with bollards; square concrete pad
		Elastic Silt (MH)(Con't)				
45	-	- red (2.5YR 4/6), very pale brown (10YR 8/3) and yellow (10YR 7/8) clay seam				
50		 Sandy Lean Clay (CL) very pale brown (10YR 8/3), strong brown (7.5YR 5/6) and red (2.5YR 4/6) wet, medium stiff, medium plasticity, some gravel 				-
55		- red (2.5YR 4/8) light gray (10YR 7/1) and black (10YR 2/1) wet				Annular Seal: Pel-Plug 3/8 Bentonite Coated
60		medium stiff, medium to high plasticity, some gravel, interbedded zones of CHS Sandy Fat Clay				Pellets (0.5 - 5gal buckets (77.0'-74.0')) and Baroid Hole Plug 3/8 Chips (10 - 50lbs bags (74.0'-25.0'))
65 70		- yellowish brown (10YR 5/6) and yellowish brown (10YR 5/6) wet, medium stiff, medium to high plasticity, some gravel				
75						
80		- and dark yellowish brown (10YR 4/6) saturated, very soft, high plasticity, with cobbles and gravel				Filter: ←Filter Media 20/40 Silica Sand (4 - 50 lbs bags)
85						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack

יר אביר י								
	6/			TEAT DO		<u> </u>		BORING GWC-49 Z PAGE 3 OF 3 GPC633179
BUVE	30		COMPANY LOG OF	- IE2I BC	RIN	G		<u>GFC055175</u>
LC GO	SOU	UTHEF	RN COMPANY SERVICES, INC.	PROJECT La	ndfill Re	placemen	t Monitorin	g Wells
PNING	EAF	RTH SC	CIENCE AND ENVIRONMENTAL ENGINEERING	LOCATION P	ant Bov	/en		
	_	U		N		TER		WELL DATA
	DEPTF (ft)	GRAPHI LOG	MATERIAL DESCRIPTION	ELEVATI	veak Ioderate REAC	BSERVATIO	Comple protect 4-foot s	etion: ive aluminum cover with bollards; square concrete pad
			Sandy Lean Clay (CL)(Con't)		<u> </u>			
	90							—Sump:0.3 ft.
		- and dark yellowish brown (10YR 4/6) saturated, very soft, high						
-10/GA-E	95		plasticity, with graver					
D H L U H L								Backfill:Filter Media 20/40 Silica Sand (0.25 - 50 lbs bags
RILLING	100							 (90.0'-89.5')) and Barold Hole Plug 3/8 Chips (5 - 50lbs bags (107.0'-92.0')
	105							
		///	Bottom of borehole at 107.0 feet.					
20								
	110	-						
IERAL								
A S L D C	115	-						
NHNGH								
4 - 0:////	120							
01 01	120							
19/9 - 1								
SASE.GL	125							
LA LA								
	130							
MPLE G	135							
ō								

.L REPLA		Log updated with revised survey certified 3,	/23/2()21	
ANDFIL		Ground Surface Elevation (feet, NAVD88): 7 Top of PVC Casing Elevation (feet, NAVD188	06.12 3): 709	.11 BORING	GWC-49 Z
New SC	TUC	HERN LOG OF TEST BOI	RINC	G	PAGE 1 OF 3 GPC633179
IGS/BC		COMPANY			
SO SO EAI	UTHEI RTH SO	RN COMPANY SERVICES, INC. PROJECT Land CIENCE AND ENVIRONMENTAL ENGINEERING LOCATION Plan	nt Bowe		
	STAR	TED 2/23/2016 COMPLETED 3/1/2016 SURF. ELEV. 706.12	C	COORDINATES: N:1504238.30 E:2	072896.49
⊟ CON B ⊢ DRIL	FRACT	OR <u>Cascade</u> EQUIPMENT <u>Tracked</u> METHOD) <u>Roto</u> Smelse	sonic er ANGLE BEA	RING
	NG DE	PTH 107 ft. GROUND WATER DEPTHDURING 48 ft. COM	P. 47.	3 ft. DELAYED 47.2 ft. after	96 hrs.
	ES				
			Z		
	UHC I	NOL	ACTIC		
DEP ⁻	LOC	MATERIAL DESCRIPTION	е КЕ	COMMENTS	Natural Gamma
15/154		ш Ш	Veak Aodera strong		55 110 165
		Sandy Silt (ML)		(Recovery=64% between 0 and 7ft.)	\sim
1 J S NI		- mouled grayish brown (10YK 5/2), strong brown (7.5YK 5/6) and brownish yellow / dark yellowish orange (10YR 6/6) very damp, soft, some clay and grayel			A M
		- medium stiff			\sim
5					$\sim 10^{-10}$
		mottled reddieb vollow. (7 EVP 6/8) and vollowish red (EVP 4/6)		(Recovery=50% between 7 and	M
		moist, medium stiff, medium plasticity, some clay and gravel		17ft.)	M
≥ 20 10		- Sun			
					M
	Щ	Delostone (COBBLES AND BOULDERS)	-		M
15		- dolostone boulder, about 2 ft. thick, gray, fresh			LAN
					A A A A A A A A A A A A A A A A A A A
		- mottled strong brown (7.5YR 5/8) and red (2.5YR 4/6) dry, medium		(Recovery=90% between 17 and 27ft.)	- Maria
20 20		- stiff			M
					\mathbb{N}
OM.					M
- 70:0		mottled brownish vollow (10VP 6/0) and red (2 EVP 4/0)			MM
25					$\sim \sim$
-		Silt (ML)	-	(Recovery=90% between 27	M
BASE		- mottled brownish yellow (10YR 6/8) and red (2.5yr 4/8) dry,		and 37ft.)	hym
<u>30</u>		- damp			MM
					LAW M
					M
5 35					MM
					WW
		Elastic Silt (MH)	-	(Recovery=100% between 37 and 47ft.)	Mm
		- mottied brownish yellow (10YR 6/8) and red (2.5YR 4/8) wet, medium stiff			M
		1	1		

(Continued Next Page)



LOG OF TEST BORING

BORING	GWC-49 Z PAGE 2 OF 3
	GPC633179

SC	OUTH			RINC		GWC-49 Z PAGE 2 OF 3 <u>GPC633179</u>
EAR	RTH SCI	ENCE AND ENVIRONMENTAL ENGINEERING	TION Plan	nt Bowe	n	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Veak Aoderate REACTION Strong	COMMENTS	Natural Gamma
		Elastic Silt (MH)(Con't)		220	(Con't)	MM
<u>45</u> 50		 - red (2.5YR 4/6), very pale brown (10YR 8/3) and yellow clay seam Sandy Lean Clay (CL) - very pale brown (10YR 8/3), strong brown (7.5YR 5/6) an (2.5YR 4/6) wet, medium stiff, medium plasticity, some grader 	(10YR 7/8) d red vel		(Recovery=100% between 47 and 57ft.)	Morry Mangaran Shangan Manana
<u>55</u> 60		- red (2.5YR 4/8), light gray (10YR 7/1) and black (10YR 2 medium stiff, medium to high plasticity, some gravel, interb zones of CHS Sandy Fat Clay	/1) wet, edded		─(Recovery=65% between 57 and 67ft.)	M. M. M. M. W. W. W. M. M. M.
65		- yellowish brown (10YR 5/6) and yellowish brown (10YR medium stiff, medium to high plasticity, some gravel	5/6) wet,		(Recovery=65% between 67 and 77ft.)	Mannahanan
75		- and dark yellowish brown (10YR 4/6) saturated, very sof plasticity, with cobbles and gravel	t, high		(Recovery=17% between 77 and 92ft.)	Morris / Www. wy Www.
85						Monnahan



LOG OF TEST BORING

BORING	GWC-49 Z	,
	PAGE 3 OF 3	3
	GPC633179)

so	DUTH		OF TEST B	ORINO	BORING	GWC-49 Z PAGE 3 OF 3 <u>GPC633179</u>
SOU Eaf	UTHERN RTH SCIE	I COMPANY SERVICES, INC. ENCE AND ENVIRONMENTAL ENGINEERIN	PROJECT <u>L</u>	andfill Rep Plant Bowe	lacement Monitoring Wells	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTIO	DN i	ELE VATION eak HCL oderate REACTION	COMMENTS	Natural Gamma ගු
90 95 100 105		Sandy Lean Clay (CL)(Con't) - and dark yellowish brown (10YR 4/6) satu plasticity, with gravel	ırated, very soft, high	We Mo	(Con't) (Recovery=13% between 92 and 107ft.)	11 16
110		Bottom of borehole at 107	.0 feet.			
<u>115</u>						
120 125						
130						
135						

SOL	Log updated with revised survey ce Ground Surface Elevation (feet, NA Top of PVC Casing Elevation (feet, LOG OF TEST AND WELL INST	ertified 3 VD88): 7 NAVDI88 BORI ALLA	/23/2021 06.24 3): 709.56 NG TION	5	BORING	GWC-49R PAGE 1 OF 3 ECS18611
SOUT EARTH	HERN COMPANY SERVICES, INC. FROSEC H SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATIO	DN <u>Plant l</u> 706.24' NA	Bowen	ORDINA	ES: N:1504246.02 E	2072918.76
CONTRA DRILLED BORING NOTES	CTOR Tristate EQUIPMENT SME550 M D BY D. Wright LOGGED BY L. Millet CHECKED DEPTH 131.1 ft. GROUND WATER DEPTH: DURING 63.5 ft.	Method _ By _l. Mil Comp.	Hollow Ster	m Auger; ANG DEL	Casing Advance; HQ Ro LE -90 BEARI AYED 49.3 ft. after 12	ock Core NG 0 hrs.
DEPTH (ft) GRAPHIC LOG	STRATA DESCRIPTION		F	Protective 4-foot squ Top of cas	WELL DATA steel cover are concrete pad sing Elev. = 709.56	ELEV
	Lean Clay (CL-ML) - orange, very moist, medium stiff, yellow mottling, partially weathered rock fragments	 		-Surface	Seal: concrete	704.: (2.0
	Silt (ML) - brown, damp, very stiff, clayey, orange and dark red mottling, trace sand, partially weathered rock fragments	701.2				
	Well-graded Sand (SW) - gray, dry, medium dense, fine to coarse grain, yellow and red mottling, clay lenses, chert fragments	696.2				
	Lean Clay (CL-ML) - orange, damp, soft, yellow and red mottling, occasional partially weathered rock fragments, trace sand	691.2				
 	Silt (ML) - orange, damp, very stiff, clayey, red and yellow mottling, partially weathered rock fragments, trace sand	686.2				
	Silt (ML) - orange, damp, very stiff, clayey, red and yellow mottling, partially weathered rock fragments, trace sand	070.0				
- 3 22:	Silt (ML) - orange, damp, very stiff, clayey, red, yellow, and light gray mottling, occasional partially weathered rock fragments, sandy lenses throughout	674.0				
04 	Silt (ML) - orange, damp, stiff, clayey, red and yellow mottling, partially weathered rock fragments	666.2				



LOG OF TEST BORING AND WELL INSTALLATION

so	DU	LOG OF T COMPANY AND WELL	EST BOR	BORING GWC-49 PAGE 2 OF ECS186 ATION
SOU EAF	UTH RTH	ERN COMPANY SERVICES, INC. P SCIENCE AND ENVIRONMENTAL ENGINEERING L	ROJECT 9 & 10	10 Landfill Wells ant Bowen
DEPTH (ft) GRAPHIC	LOG	STRATA DESCRIPTION	ELEV	WELL DATA Protective steel cover 4-foot square concrete pad Top of casing Elev. = 709.56
		Lean to Fat Clay (CH) - red, damp, stiff, low to medium plasticity, yellow mottling, silt sand	y, trace	
45		Silt (ML) - orange, damp, medium stiff, clayey, yellow and light yellow n clayey lenses	661.2 nottling,	_2
20	<u> </u>	Silt (ML) - yellow, very moist, stiff, clayey, light yellow mottling, few san lenses	656.2 d	<u>j.2</u>
30: : : : 55:		Silt (ML) - yellow, wet, medium stiff, clayey, brown mottling, few thin sa lenses, trace clay	651.2 nd	.2 Annular Fill: Portland Cement Grout
 		Clayey Sand (SC) - brown, wet, medium dense, medium to coarse grain	010.	
<u> </u>		Elastic Silt (MH) - yellow, wet, hard, medium plasticity, clayey, orange and blac mottling, partially weathered rock fragments	636.2 k	
		Silt (MH) - yellow, wet, soft, medium plasticity, clayey, orange and black mottling, trace sand	631.2	.2
80 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		Elastic Silt (ML) - yellow, wet, stiff, clayey, orange and dark brown mottling, cla lenses, partially weathered rock fragments	626.2 IV	.2
82		(MH) - yellow, wet, very hard, medium plasticity, clayey, brown moth sand lenses, partially weathered rock fragments	621.2 ling,	2



LOG OF TEST BORING AND WELL INSTALLATION

SOUT	FLIEDN COMPANY SERVICES INC. PROJEC	r 9&1	0 Landfill	Wells	
EART	THERN COMPANY SERVICES, INC. TH SCIENCE AND ENVIRONMENTAL ENGINEERING LOCATION	N Plan	t Bowen		
GRAPHIC LOG	STRATA DESCRIPTION			WELL DATA Protective steel cover 4-foot square concrete pad Top of casing Eley. = 709 56	
		ELEV			(D
	(MH)(Cont)	616 2			
	- hard, No recovery	010.2			
	Elastic Silt (MH) - brown, wet, very stiff, medium plasticity, clayey, orange mottling, sandy lenses, partially weathered rock fragments	611.2			
	Elastic Silt (MH) - orange, wet, very stiff, medium plasticity, clayey, gray mottlin, partially weathered rock fragments, clay lenses, trace sand	606.2			
	Silt (MH) - orange, wet, very soft, clayey, light orange mottling, heavily and partially weathered rock fragments, trace sand	601.2			
	Clayey Sand (ML) - gray, wet, very hard, clayey, yellow mottling, partially weathered rock fragments	596.2			(1
/_/ 	Dolostone (SC) - yellow, wet, very hard, fine to coarse grain, partially weathered rock fragments	591.2	2	←Annular Seal: bentonite pellets	
	Dolomite - gray, hard, slightly weathered, slightly disintegrated, slightly fractured	586.2		← Filter: silica filter sand	(1 (1
_/	Dolomite	581.2		Well: 2" OD PVC (SCH 40) Well: 2" OD PVC (SCH 40)	
_/	 - gray, hard, moderately weathered, slightly disintegrated, moderately to intensely fractured 			Screen: 10 ft. pre-pack	
	Delomito	576.2			

Groundwater Monitoring Plan Georgia Power Company ■ Plant Bowen CCR Landfill September 2022 ■ WSP USA Project No. 6122160287

ATTACHMENT A2

WELL DRILLING CONTRACTOR PROOF OF BONDING



Power of Attorney

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

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

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

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

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

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



me onam

Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA HENNEPIN COUNTY

On this twenty-seventh day of April, 2020, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Notary Public

By

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

		 CORPORATE SEAL
This Power of Attorney expires January 31, 2025]	1986 07 T
		and the second second

un Abbar

Kara Barrow, Secretary

Please direct bond verifications to surety@intactinsurance.com

CONTINUATION CERTIFICATE

Atlantic Specialty	/ Insurance Company	, Surety upon
a certain Bond No.	800033976	Issued on 9/27/2017 Expires on 6/30/2021
dated effective	09/27/2017 (MONTH-DAY-YEAR)	Renewed on 4/12/2021 Expires on 6/30/2023
on behalf of	Ricky Davis / Cascade Drilling, L.P. (PRINCIPAL)	
and in favor of	Department of Natural Resources, State of Georgia (OBLIGEE)	
does hereby continue s	aid bond in force for the further period	
beginning on	06/30/2021 (MONTH-DAY-YEAR)	
and ending on	06/30/2023 (MONTH-DAY-YEAR)	
Amount of bond	Thirty Thousand and 00/100 Dollars (\$30,000.00))
Description of bond	Performance Bond for Water Well Contractors	

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

Signed and dated on April 12th, 2021 (MONTH-DAY-YEAR)	÷
By Atlantic Specialty Insurance Company	-
Attorney-in-Fact Andrew P. Larsen Parker, Smith & Feek, Inc.	
Agent 2233 112th Ave NE Bellevue, WA 98004	-
425-709-3600 Telephone Number of Agent	_

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 Divi (OBLIGEE)	ision
does hereby continue	aid 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	
PROVIDED: That it provision that the S not be cumulative as account of all defau shall not in any even Signed and dated on	his continuation certificate does not create a new obligation and is execute urety's liability under said bond and this and all Continuation Certificates is ad that the said Surety's aggregate liability under said bond and this and all its committed during the period (regardless of the number of years) said bont t exceed the amount of said bond as hereinbefore set forth. 05/06/2021 (MONTH-DAY-YEAR)	d upon the express condition an sued in connection therewith sha such Continuation Certificates o nd had been and shall be in forc
	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.	
ALLO .	2211 7th Avenue South, Birmingham, AL 35233 Address of Agent	
	(205) 252-9871 Telephone Number of Agent	



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

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 Birmingham state of AT 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



PAS

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

David M. Carey, Assistant Secretary

State of PENNSYLVANIA County of MONTGOMERY

guarantees.

value etter of

residual

loan,

note, la ate or

interest rate

Đ rat

for mortgage,

valid f

Not valid currency

credit

(POA) verification inquiries, HOSUR@libertymutual.com , 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance March On this 11th day of Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so Attorney or email to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written

nwealth of Pennsylvania - Notary Sea Toresa Pastella, Notary Public Montgomery County My commission expires March 28, 2025 nonistrian number 1126044 Co nin Association of Notarias

lerea Patelle

eresa Pastella, Notary Public

call 610-832-8240 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 Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations or American States insurance company of America, General Insurance Company of America, and Saleco 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 seal, acknowledge and deliver as surely the 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 seal, acknowledge and deliver as surely the other official of the Corporation in make even the seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation attractions as the chairman or the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the corporation in the president seal, acknowledge and deliver as surely the other official of the corporation in the president seal acknowledge and the president seal acknowledge and the president seal acknowledge and the president seal acknowledge a 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 6th day of



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	his 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 C Its committed during the period (regardless of the number of years) said bond had it exceed the amount of said bond as hereinbefore set forth. <u>05/06/2021</u> (MONTH-DAY-YEAR)	the express condition and connection therewith shall continuation Certificates on been and shall be in force,
	SAFECO Insurance Company of America 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 (205) 252-9874 Telephone Number of Agent	_



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

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 Birmingham state of AT 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



PAS

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

David M. Carey, Assistant Secretary

State of PENNSYLVANIA County of MONTGOMERY

guarantees.

value etter of

residual

loan,

note, la ate or

interest rate

Đ rat

for mortgage,

valid f

Not valid currency

credit

(POA) verification inquiries, HOSUR@libertymutual.com , 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance March On this 11th day of Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so Attorney or email to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written

nwealth of Pennsylvania - Notary Sea Toresa Pastella, Notary Public Montgomery County My commission expires March 28, 2025 nonistrian number 1126044 Co nin Association of Notarias

lerea Patelle

eresa Pastella, Notary Public

call 610-832-8240 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 Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations or American States insurance company of America, General Insurance Company of America, and Saleco 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 seal, acknowledge and deliver as surely the 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 seal, acknowledge and deliver as surely the other official of the Corporation in make even the seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation attractions as the chairman or the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the Corporation in the president seal, acknowledge and deliver as surely the other official of the corporation in the president seal, acknowledge and deliver as surely the other official of the corporation in the president seal acknowledge and the president seal acknowledge and the president seal acknowledge and the president seal acknowledge a 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 6th day of



CONTINUATION CERTIFICATE

Atlantic Specialty	Insurance Company	, Surety upon	
a certain Bond No. 8	300033976	Issued on 9/27/2017	
dated effective	09/27/2017 (MONTH-DAY-YEAR)	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 o (OBLIGEE)	f Georgia	
oes hereby continue s	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 Cor	tractors	
Premium:	\$1200.00		
PROVIDED: That the provision that the Su not be cumulative an account of all defaul shall not in any event Signed and dated on	nis continuation certificate does not create a new rety's liability under said bond and this and all C d that the said Surety's aggregate liability under ts committed during the period (regardless of the exceed the amount of said bond as hereinbefore s <u>March 4th, 2019</u> (MONTH-DAY-YEAR)	obligation and is executed upon the express condition ontinuation Certificates issued in connection therewi said bond and this and all such Continuation Certific number of years) said bond had been and shall be i et forth.	on an th sha ates c n forc
	Atlantic Specialty Insurance Compan		
MVEIC - A	By Amus P. S Attorney-in-Fact Andrew P. Larsen Parker, Smith & Feek, Inc. Agent	<u> </u>	
10 100 100 00 000 000 000 000 000 000 0	By Andrew P. Larsen Attorney-in-Fact Andrew P. Larsen Parker, Smith & Feek, Inc. Agent 2233 112th Ave NE Bellevue, WA 98 Address of Agent 425-709-3600	004	

XDP



, 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 - Dept. of Natural Resources
	(OBLIGEE)
does hereby continue said	bond in force for the further period
beginning on	June 30, 2014 (MONTH-DAY-YEAR)
and ending on	June 30, 2015 (MONTH-DAY-YEAR)
Amount of bond	\$10,000.00
Amount of bond Description of bond	\$10,000.00 Water Well Contractors & Drillers

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

CONTINUATION CERTIFICATE

Signed and dated on	April 09, 2014 (MONTH-DAY-YEAR)
	SAFECQ Insurance Company of America By 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 nam ein, and they have no authority to bind the Company excer e 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 surely and as its act and deed, any and all undertakings, bonds, recognizances and other surely 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 Attomey 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 day of May 2013 COL CON First National Insurance Company of America Power of Attorney call am and 4:30 pm EST on any business day. 1928 1923 1953 General Insurance Company of America Safeco Insurance Company of America By: or residual value guarantees. Gregory W. Davenport, Assistant Secretary STATE OF WASHINGTON <u>ss</u> COUNTY OF KING 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. DALE ONM Cts NOTARY PUBLIC 00.20 Late WAG This Power of Atlomey is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General To confirm the validity of this 1-610-832-8240 between 9:00 : Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows: interest 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 ġ 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 ē 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 currency 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 attomeys-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 ODRI

David M. Carey, Assistant Secretary

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



OT Crealt,

Ioan, letter

າາເບເບເມສູ່ນີ້ອີ້ນີ້ ເບດເອ,

2

NIDA 1ALI

Southern Company Services, Inc. 30 Ivan Allen Jr. Boulevard NW Atlanta, Georgia 30308



May 8, 2013

10

6

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

Re: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Dear Mr. McCook:

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2014.

Please let me know if you need additional assistance.

Sincerely,

Flementine Broaders

Clementine Broaders Risk Management Associate <u>cbbroade@southernco.com</u> 404-506-0701

/cb

Enclosure

cc: Sarah Roberts

CONTINUATION CERTIFICATE



20

, 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 - Dept. of Natural Resources
	(OBLIGEE)
does hereby continue said	bond in force for the further period
beginning on	June 30, 2013 (MONTH-DAY-YEAR)
and ending on	June 30, 2014 (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	<u>May 03, 2013</u> (MONTH-DAY-YEAR)	_
	SAFECO Insurance Company of America By D- D- Multi de Oly D-Ann Kleidosty, Attorney-In-Fact	_
-		

ID UNLESS IT IS PRINTED ON RED BACKGERUND. srein, and they have no authority to bind the Company exce

he manner and to the extent herein stated. Certificate No. 5634691

day.

between

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; Sylvia M. Ogle; Tracey D. Watson; William G. Moody

state of GA all of the city of Atlanta 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 day of October thereto this 31st 2012

First National Insurance Company of America 1923 1953 General Insurance Company of America Safeco Insurance Company of America of this Power of Attorney call in 9:00 am and 4:30 pm EST on any business Bv: Greaory W. Davenport, Assistant Secretary STATE OF WASHINGTON SS COUNTY OF KING On this 31st day of October 2012, 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. O Bit of CONNI ELS By: KD Riley, Notary Rublic NOTARY PUBLIC 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 validity subject to such limitation as the Chairman or the President may prescribe, shalt 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 To confirm the 1-610-832-8240 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 attomeys-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. IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 310 day of 1928 1923 1953 David M. Carey, Assistant Secretary

Southern Company Services, Inc. 30 Ivan Allen Jr. Boule 'NW Atlanta, Georgia 3030

1721

.



April 20, 2012

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

Re: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Dear Mr. McCook:

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2013.

Please let me know if you need additional assistance.

Sincerely,

Comentine Broaders

Clementine Broaders Risk Management Associate <u>cbbroade@southernco.com</u> 404-506-0701

/cb

Enclosure

cc: Stacy Sprayberry, SCS

, 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 - Dept. of Natural Resources
	(OBLIGEE)
does hereby continue said	bond in force for the further period
beginning on	June 30, 2012 (MONTH-DAY-YEAR)
and ending on	June 30, 2013 (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.

CONTINUATION CERTIFICATE

Signed and dated on	April 11, 2012 (MONTH-DAY-YEAR)	
	SAFECO Insurance Company of America By	

THIS POWER OF ATTORNEY	IS NOT VALID	UNLESS IT IS PRINTED O	N RED BACKGROUND.	519348
This Power of Attorney limits the a herein stated	f those name	d herein, and they have no aut	hority d the Company except in the	e manner and to the ext
intern stated.	s	AFECO INSURANCE COMPAN SEATTLE, WASHING	Y OF AMERICA	
		POWER OF ATTOR	NEY	
KNOW ALL PERSONS BY THESE I pursuant to and by authority of the CHAUN M. WILSON, MICHAEL F. YAD	'RESENTS: That S By-law and Auth- ACH, NORMANDY S	Safeco Insurance Company of orization hereinafter set forth, SUTTON, WILLIAM G. MOODY, D-A	America (the "Company"), a Washingtor does hereby name, constitute and app NN KLEIDOSTY, TRACEY D. WATSON, SY	i stock insurance compa oint GARY D. EKLUND,
CITY OF ATLANTA, STATE OF GEORG	\$IA	*****		
, each individually if there be more th surety and as its act and deed, <u>TWO HUNDRED FIFTY MILLION AND</u> bonds, recognizances and other sure president and attested by the secretan	an one named, its t any and all unde 20/100 ty obligations, in put of the Company in	true and lawful attorney-in-fact to ertakings, bonds, recognizance DOLLARS (\$ 250,000,000.00" rsuance of these presents, shall b their own proper persons.	make, execute, seal, acknowledge and de s and other surety obligations in the) each, and the exe e as binding upon the Company as if they	eliver, for and on its behal penal sum not exceed ecution of such undertakin had been duly signed by
That this namer is made and even its	id purpupat to and I	hu outboribu of the fellouine. Du le		
That this power is made and execute	to porsuant to and t	by authority of the following By-la	aw and Authonzation:	
ARTICLE IV - Officers: Sec	tion 12. Power of A	Itomey.		
as the Chairman or the Pre execute, seal, acknowledg fact, subject to the limitati executed, such instrumen	sident may prescrib sident may prescrib je and deliver as su ons set forth in the ts shall be as bindir	authonized for that purpose in wi be, shall appoint such attorneys-in irety any and all undertakings, b ir respective powers of attorney, ng as if signed by the president a	iting by the Chairman or the President, ar n-fact, as may be necessary to act in behal onds, recognizances and other surety obl shall have full power to bind the Corpor and attested by the secretary.	Id subject to such limitation of the Corporation to ma ligations. Such attorneys ation by their signature of
By the following instrument the cha	irman or the presid	dent has authorized the officer o	or other official named therein to appoint	attorneys-in-fact:
Pursuant to Article IV, Sec appoint such attorneys-in- any and all undertakings.	tion 12 of the By-la fact as may be nec bonds, recognizand	aws, David M. Carey, Assistant S cessary to act in behalf of the Co ces and other surety obligations.	Secretary of Safeco Insurance Company prporation to make, execute, seal, acknow	of America, is authorized vledge and deliver as su
I hat the By-law and the Authorization	1 set forth above ar	e true copies thereof and are no	w in full force and effect.	
IN WITNESS WHEREOF, this Power Safeco Insurance Company of Ameri	r of Attorney has ca has been affixed	been subscribed by an author I thereto in Plymouth Meeting, Pe	rized officer or official of the Company ennsylvania this <u>24th</u> dayof	and the corporate sea February
		A CARDING COMPANY	SAFECO INSURANCE COMPAN	NY OF AMERICA
		3 1953 P	By defavil 1. Lang	<u>ka mangan ka</u> wa 2
COMMONWEALTH OF PENNSYLVAN COUNTY OF MONTGOMERY	lIA ss	"George	David M. Carey, Assistant Secretary	
On this <u>24th</u> day of <u>acknowledged</u> that he is an Assist executed the above Power of Attor direction of said corporation.	February ant Secretary of S ney and affixed the	, 2012 , before me, a No afeco Insurance Company of A e corporate seal of Safeco Ins	tary Public, personally came <u>David M.</u> America; that he knows the seal of sak urance Company of America thereto wi	Carey, to me known, a d corporation; and that th the authority and at
IN TESTIMONY WHEREOF Have	and subscribe	d my name and offixed my net	nial cost of Olymputh Masting, Descud	meter on the day and .
first above written.		Nolarial Soal Teresa Pacteda, Notary Public Phymetry Twa Monteomeory County	By Teress Pastella	/ama, on the day and y
CERTIFICATE	MINE M	My Commission Expires Mar. 28, 2013 ember, Pennsylvania Association of Notaries	Teresa Pastella, Notary Public	
I, the undersigned, Vice President of is a full, true and correct copy, is in said power of attorney is an Officer 12 of the By-laws of Safeco Insuran	Safeco Insurance full force and effect specially authorize ce Company of An	Company of America, do here to n the date of this certificate; ed by the chairman or the pres nerica.	by certify that the original power of attor and I do further certify that the officer o ident to appoint attorneys-in-fact as pro	ney of which the foregoi r official who executed t vided in Article IV, Secti
This certificate and the above pow following vote of the board of direct	er of attorney may ors of Safeco Insur	y be signed by facsimile or me ance Company of America at a	echanically reproduced signatures und meeting duly called and held on the 18t	er and by authority of t h day of September, 20
VOTED that the facsimile of copy of any power of atto	r mechanically rep mey issued by the	produced signature of any assis company in connection with su	tant secretary of the company, wherever urety bonds, shall be valid and binding u	appearing upon a certifi pon the company with t
IN TESTIMONY WHEREOF L have	hereupto subser	had my name and offixed the	comparate seal of the actid assessor	11th
LION 1 2012	nereunity autochi	bed my name and anized the	corporate sear or the said company, I	day

a,

7953 ina and

report

Gregory W. Davenport, Vice President



May 2, 2011

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

Re: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2012.

Please let us know if you need additional information.

Sincerely,

lementine Broaders

Clementine Broaders Southern Company Services, Inc. Risk Management Department

/cb

Enclosure

cc: Stacy Sprayberry, SCS



CONTINUATION



	SAFECO Insurance Co	mpany of America	, Surety upon
	a certain Bond No.	4993104	
	dated effective	June 30, 2005 (MONTH-DAY-YEAR)	
	on behalf of	Southern Company Services, Inc. (PRINCIPAL)	
	and in favor of	State of Georgia - Dept. of Natural Resources	
		(OBLIGEE)	
	does hereby continue said	bond in force for the further period	
	beginning on	June 30, 2011 (MONTH-DAY-YEAR)	
ļ	and ending on	June 30, 2012 (MONTH-DAY-YEAR)	
	Amount of bond	\$10,000.00	
	Description of bond	License 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 21, 2011 (MONTH-DAY-YEAR)

SAFECO Insurance Company of America

refu Βv

Barbara S. MacArthur, Attorney-In-Fact

THIS POWER OF ATTORNEY IS NOT VALID

herein stated.

SS IT IS PRINTER 9 WEROUND.

no anthority to bind the Company except in the manner and to the extent This Power of Attorney limits the acts of those named herein, and me

> SAFECO INSURANCE COMPANY OF AMERICA SEATTLE, WASHINGTON POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS: That Safeco Insurance Company of America (the "Company"), a Washington stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint VIRGINIA B. MCMANUS, GARY D. EKLUND, BARBARA S. MACARTHUR, CHAUN M. WILSON, MICHAEL F. YADACH, ALL OF THE CITY OF ATLANTA, STATE OF GEORGIA

, 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 the penal sum not exceeding undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

ARTICLE IV - Execution of Contracts: Section 12. Surety Bonds and Undertakings.

66

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitations 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-infact, 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 by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article IV, Section 12 of the By-laws, Garnet W. Elliott, Assistant Secretary of Safeco Insurance Company of America, is authorized to 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.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Safeco Insurance Company of America has been affixed thereto in Plymouth Meeting, Pennsylvania this 14th day of _____ October 2010



SAFECO INSURANCE COMPANY OF AMERICA

Garnet W. Elliott, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA COUNTY OF MONTGOMERY

2010 , before me, a Notary Public, personally came Garnet W. Elliott, to me known, and On this 14th October day of acknowledged that he is an Assistant Secretary of Safeco Insurance Company of America; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Safeco Insurance Company of America thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF L have Hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

CERTIFICATE

Not valid for mortgage, note, loan, letter of credit, bank deposit,

interest rate or residual

rate,

currency

value guarantees.

Q.L. ONMONWER U ÖF WSYLVA

Noladal Seal Tarasa Pastella, Notary Public Plymouth Twp., Monigomery County My Commission Expires Mar. 28, 2013 Member, Pennsylvania Association of Notaries

David M. Carey, Assistant Secretary

Teresa Pastella, Notary Public

I, the undersigned, Assistant Secretary of 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, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article IV. Section 12 of the By-laws of Safeco Insurance Company of America.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Safeco Insurance Company of America at a meeting duly called and held on the 18th day of September, 2009.

VOTED that the 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.

IN FATIMONY WHEREOF, I have hereunto subscribed my	y name and affixed	the corporate seal of the sai	id company, this_	als	day of
april 2011	AND CORPORATE CA	Λ,			





CONTINUATION CERTIFICATE



SAFECO Insurance Co	mpany of America	, Surety upon
a certain Bond No.	4993104	
dated effective	June 30, 2005 (MONTH-DAY-YEAR)	
on behalf of	Southern Company Services, Inc. (PRINCIPAL)	
and in favor of	State of Georgia - Dept. of Natural Resources	
	(OBLIGEE)	
does hereby continue said	l bond in force for the further period	
beginning on	June 30, 2010 (MONTH-DAY-YEAR)	
and ending on	June 30, 2011 (MONTH-DAY-YEAR)	
Amount of bond	\$10,000.00	
Description of bond	License 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 15, 2010 (MONTH-DAY-YEAR)
	SAFECO Insurance Company of America By Darbure S. Marthur Barbara S. MacArthur, Attorney-In-Fact

POWER OF ATTORNEY

6724 No

KNOW ALL BY THESE PRESENTS:

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

************GARY D. EKLUND; BARBARA S. MACARTHUR; VIRGINIA B. MCMANUS; CHAUN M. WILSON;

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

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

this	2nd day of February 2010	Ċ.
Duxter Q. fayy	TAMicholajewski.	
Dexter R. Legg, Secret	ryTimothy A. Mikolajewski, Vice President	-

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attomeys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out, (i) The provisions of Article V, Section 13 of the By-Laws, and

- (ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
- (iii) Certifying that said power-of-attorney appointment is in full force and effect,

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

1, Dexter R. Legg ___, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney Issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

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



S-0974/DS 3/09

Southern Company Services, Inc. 30 Ivan Allen Jr. Boulevard NW Atlanta, Georgia 30308



May 27, 2009

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

RE: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2010.

Please let us know if you need additional information.

Best Regards,

Jacpson

Annie Jackson Southern Company Services, Inc. Risk Management Department

/aj

Enclosure

cc: Alan Garrard, SCS



CONTINUATION CERTIFICATE



SAFECO Insurance Co	ompany of America	, Surety upon
a certain Bond No.	4993104	
dated effective	June 30, 2005 (MONTH-DAY-YEAR)	
on behalf of	Southern Company Services, Inc. (PRINCIPAL)	
and in favor of	State of Georgia - Dept. of Natural Resources	
	(OBLIGEE)	
does hereby continue said	I bond in force for the further period	
beginning on	June 30, 2009 (MONTH-DAY-YEAR)	
and ending on	June 30, 2010 (MONTH-DAY-YEAR)	
Amount of bond	\$10,000.00	
Description of bond	License 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 24, 2009 (MONTH-DAY-YEAR)
	SAFECO Insurance Company of America By Darbura A Machrichun Barbara S. MacArthur, Attorney-In-Fact


POWER OF ATTORNEY Safeco Insurance Company of America General Insurance Company of America 1001 4th Avanue Suite 1700 Seattle, WA 98154

KNOW ALL BY THESE PRESENTS:

No. 6724

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

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

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

this 21st	day of March , 2009	
Dexter &. fay	TAMilalajeushi.	
Dexter R. Legg, Secretary	Timothy A. Mikolajewski, Vice President	

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

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

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

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

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



day of

1057

Dexter R. Legg, Secretary

S-0974/DS 3/09

WEB PDF

Southern Company Services, Inc. 30 Ivan Allen Jr. Boulevard NW Atlanta, Georgia 30308



June 26, 2008

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

RE: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2009.

Please let us know if you need additional information.

Best Regards,

Jackson Annie Jackson

Southern Company Services, Inc. Risk Management Department

/aj

Enclosure

cc: Alan Garrard, SCS







SAFECO Insurance Company of America

, Surety upon

a certain Bond No.	4993104
dated effective	June 30, 2005 (MONTH-DAY-YEAR)
on behalf of	Southern Company Services, Inc. (PRINCIPAL)
and in favor of	State of Georgia - Dept. of Natural Resources
	(OBLIGEE)
does hereby continue said	bond in force for the further period
beginning on	June 30, 2008 (MONTH-DAY-YEAR)
and ending on	June 30, 2009 (MONTH-DAY-YEAR)
Amount of bond	\$10,000.00
Description of bond	License Bond - Water Well Contractors & Drillers
Premium:	\$100.00
(x)	

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	<u>April 25, 2008</u> (MONTH-DAY-YEAR)
	SAFECO Insurance Company of America
	By Darbare S. MacTuther Barbara S. MacArthur Attorney. In Fact

Safeco	
	10

3

POWER OF ATTORNEY Saleco Insurance Company of America General Insurance Company of America Saleco Piaza Seattle, WA 98185

KNOW ALL BY THESE PRESENTS:

No. 6724

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

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

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

this 28th	day of February	, 2008
Alexanis Dalug Datsen	TAMiholajen	sla.
STEPHANIE DALEY-WATSON, SECRETARY	TIM MIKOLAJEWSKI, SENIOR VI	CE-PRESIDENT, SURETY

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any Instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

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

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

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

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

Th this ECON 01 Wash

2008 day of

later Hickarie Dalut

STEPHANIE DALEY-WATSON, SECRETARY

Safeco® and the Safeco logo are registered trademarks of Safeco Corporation. WEB PDF

S-0974/DS 4/05

Southern Company Services, Inc. 30 Ivan Allen Jr. Boulevard NW Atlanta, Georgia 30308



August 14, 2007

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King Jr. Dr. SW Room 400 Atlanta, GA 30334

RE: Performance Bond for Water Well Contractors and Drillers Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2008.

Please let us know if you need additional information.

Best Regards,

Jackson

Annie Jackson \checkmark Southern Company Services, Inc. Risk Management Department

/aj

Enclosure

cc: Alan Garrard, SCS



SAFECO INSURANCE COMPANY OF AMERICA

a certain Bond No. 4993104

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

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

and in favor of Georgia - Dept. of Natual Resources

(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30 2007

(MONTH-DAY-YEAR)

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

Amount of bond \$10,000

Description of bond License Bond - Water Well Contractractors and Drillers

Premium:

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

Signed and dated on	June 30 2007 (MONTH-DAY-YEAR) SAFECO INSURANCE COMPANY OF AMERICA By Cauto D. Huss Marsh USA, Inc. Agent 3475 Piedmont Road NE, Suite 1200, Atlanta, GA 30305 Address of Agent	SUBINICE COMPANY CORPORATE SEAL SEAL STATE OF WASHINGON
	Address of Agent (404) 995-3702 Telephone Number of Agent	

, Surety upon



POWER OF ATTORNEY Safeco Insurance Company of America General Insurance Company of America Safeco Plaza Seattle, WA 98185

KNOW ALL BY THESE PRESENTS:

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

6724

Na

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

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

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

this 17th	day ofAugust	. 2006
Alexanis Dalley Vatser	TAMicholagen	shi.
STEPHANIE DALEY-WATSON, SECRETARY	TIM MIKOLAJEWSKI, SENIOR V	ICE-PRESIDENT SURETY

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate tilles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

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

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

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

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

this day of HEE COMPANY COA WISH of Wash

espanie Dalle

STEPHANIE DALEY-WATSON, SECRETARY

Safeco® and the Safeco logo are registered trademarks of Safeco Corporation. WE8 PDF

5-0974/DS 4/05

PERFORMANCE BOND FOR WATER VELL CONTRACTORS

AND DRILLERS Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER

KHOW ALL MEN BY THESE PRESENTS.

WHEREAS, the Water Well Standards Act of 1985 (Ge. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the proceduras and standards set forth in the Act as now or hareafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Sursty, for value received, agrees that no Amendmant to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its oblightion on this bond, and does hareby waive notice of any such amendmant, adoption, or modification.

This bond shall be effective from date of issuance er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or concellation upon 60 days written notice to Frincipal and Obliges; provided that the rights of the Obliges and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2006

IK WITHES WHEREOF the Frincipal and Suraty have caused these presents to be duly signed and sealed, this 15th day of April 2003

SOUTHERN COMPANY SERVICES, INO Principal, Byi An 11 4101 441 CALL H DARRS IR

Approved as to sufficiency and accepted: ASSISTANT SECRETARY

12						
S	S	A F	E	С	0°	POWER OF ATTORNEY

SAFECO INSURANCE COMPANY OF	AMERICA
GENERAL INSURANCE COMPANY O	F AMERICA
HOME OFFICE: SAFECO PLAZA	
SEATTLE, WASHINGTON 98185	<u>_</u>

No. 6724

day of November

KNOW ALL BY THESE PRESENTS:

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

**SANDRA S. CARTER; JUDY GAY CERA; GARY D. EKLUND; JUDY S. FLEMING; VIRGINIA B. MCMANUS; BARBARA S. MACARTHUR; EDWARD L. MITCHELL;

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

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

RAGierson

R.A. PIERSON, SECRETARY

IIKE MCGAVICK, PRESIDEN

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attomeys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking,"

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

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

(i) The provisions of Article V, Section 13 of the By-Laws, and

(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and

(iii) Certifying that said power-of-attorney appointment is in full force and effect,

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

this 14th

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

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

15+1

day of





R a Gierson

R.A. PIERSON, SECRETARY

IMPORTANT NOTICE TO SURETY BOND CUSTOMERS REGARDING THE TERRORISM RISK INSURANCE ACT OF 2002

As a surety bond customer of one of the SAFECO insurance companies (SAFECO Insurance Company of America, General Insurance Company of Americas, First National Insurance Company, American States Insurance Company or American Economy Insurance Company), it is our duty to notify you that the Terrorism Risk Insurance Act of 2002 extends to "surety insurance". This means that under certain circumstances, we may be eligible for reimbursement of certain surety bond losses by the United States government under a formula established by this Act.

Under this formula, the United States government pays 90% of losses caused by certified acts of terrorism that exceed a statutorily established deductible to be paid by the insurance company providing the bond. The Act also establishes a \$100 billion cap for the total of all losses to be paid by all insurers for certified acts of terrorism. Losses on some or all of your bonds may be subject to this cap.

This notice does not modify any of the existing terms and conditions of this bond, the underlying agreement guaranteed by this bond, any statutes governing the terms of this bond, or any generally applicable rules of law.

At this time, there is no premium charge resulting from this Act.

Ċ

270 Peachtree Street NW Atlanta, Georgia 30303-1205 Tel 404.506.6526



November 5, 2001

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King, Jr. Dr., SW Room 400 Atlanta, Georgia 30334

RE: Performance Bond for Water Well Contractors and Drillers - 4993104

Dear Mr. McCook:

Enclosed is the original signed copy of the captioned bond effective through June 30, 2003. Please call if you have any questions or need further information.

clasm

Annie Jackson Risk Management Associate

/aj

Enclosure

cc: Alan Garrard

\\GAXGPFS02\ANLJACKS\$\Data\WORD\Dean\GPC Water Well Bond.doc

PERFORMANCE BOND FOR HATER WELL CONTRACTORS

AND DRILLERS

Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER

KHOW ALL HEN BY THESE PRESENTS.

WHERRAS, the Mater Mell Standards Act of 1983 (Ge. Laws 1983, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure nompliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of sold Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its oblightion on this bond, and does hereby wrive notice of any such amendment; adoption, or modification.

This bond shall be effective from date of issuance er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, wutual agreement of concellation upon 60 days written notice to Frincipal and Obliges; provided that the rights of the Obliges and beneficiaries under this bond which arose prior to such termination shall continue.

Unless soonsr terminated, this bond shall terminate June 30, 2003

IN WITHESS WHERKOF the Frincipal and Sursty have caused these presente to be duly signed and sealed, this <u>30th</u> day of <u>October</u> 2001 -

SOUTHERN COMPANY SERVICES Principal, By: start Ut (1.5.) SAM H. DADDS, JR.

ASSISTANT SECRETARY

Approved as to sufficiency and accepted:

Environmental Protection Division,

Department of Natural

Laourage

SAFECO INSURANCE COMPANY OF AMERICA Jurety, Jy: Dan Una (1997) (1.8.) Sandra J. Mathis, Attorney-In-Fact



POWER OF ATTORNEY SAFECO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE: SAFECO PLAZA SEATTLE, WASHINGTON 98185

No. 6724

KNOW ALL BY THESE PRESENTS:

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

*****SANDRA S. CARTER; JUDY GAY CERA; GARY D. EKLUND; JUDY S. FLEMING; VIRGINIA B. MCMANUS; BARBARA S. MACARTHUR; SANDRA J. MATHIS; EDWARD L. MITCHELL; NANCY NIX; BARBARA THOMPSON; CYNTHIA I. RODOLPH; Atlanta, Georgia***************************

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

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

this 2nd

day of February

Ra Pierson

R.A. PIERSON, SECRETARY

BOH A. DICKEY, PRESIDENT

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surely operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

- (i) The provisions of Article_V_Section_13 of the By-Laws, and
- (ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
- (iii) Certifying that said power-of-attomey appointment is in full force and effect,

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

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

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

day of

2001



RAPierro

R.A. PIERSON, SECRETARY

slot

Southern Company Services, 1 Bin 920 270 Peachtree Street NW Atlanta, Georgia 30303

> SOUTHERN COMPANY Energy to Serve Your World

July 24, 2000

Tel 404.506 0701

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King, Jr. Dr., SW Room 400 Atlanta, Georgia 30334

RE: Performance Bond for Water Well Contractors and Drillers - 4993104

Dear Mr. McCook:

Enclosed is the original signed copy of the captioned bond. Please call if you have any questions or need further information.

Ē etpeloson

Annie Jackson Risk Management Associate

/aj

Enclosure

cc: Alan Garrard

PERFORMANCE BOND FOR WATER WELL CONTRACTORS

AHD DAILLERS Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER

KHOW ALL HEN BY THESE PRESENTS.

That WA SOUTHERN COMPANY SERVICES, INC. , as Principal, and SAFECO INSURANCE COMPANY OF AMERICA , as Surety, are hald and firmly bound unto the Director of the Environmental Protection Division ("Director"), Department of Natural Easources, State of Georgia and his successor or successors in office, as Obligee, in the full sum of TEN THOUSAND & No/100 Dollars (\$10,000.00), for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Water Wall Standards Act of 1985 (Ga. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendmant to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendmant, adoption, or modification.

This bond shall be effective from date of issuance er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or concellation upon 60 days written notice to Frincipal and Obliges; provided that the rights of the Obliges and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2001

IN WITHESS WIERSOF the Frincipsl and Suraty have caused these presents to be duly signed and sealed, this <u>lith</u> day of <u>July</u> 2000_.

SOUTHERN COMPANY SERVICES / LAC Principal, Byi Titlei JAN H. DADDS (L.S.) ASSISTANT SECRETARY

Approved as to sufficiency and accepted:

Environmental Protection Division,

Department of Natural

Lesources

SAFECO INSURANCE COMPANY OF AMERICA Juraty, Jyi Sandra (27) Math.) Sandra J. Mathis, Attorney-In-Fact



POWER OF ATTORNEY SAFECO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE: SAFECO PLAZA SEATTLE, WASHINGTON 98185

No. 6724

KNOW ALL BY THESE PRESENTS:

ŕ.

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

MATHIS; EDWARD L. MITCHELL; NANCY NIX; BARBARA THOMPSON; RONALD A. SANTANIELLO; Atlanta, Georgia

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

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

this 21

RaGierson

R.A. PIERSON, SECRETARY

W. Landell Stiller

W. RANDALL STODDARD, PRESIDENT

CERTIFICATE

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

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

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

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

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

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

this <u>11th</u> day of <u>July</u> 2000



RA Qierron

R.A. PIERSON, SECRETARY

270 Peachtree Street, NW. Atlanta, Georgia 30303 Tel 770.393.0650

3



January 14, 1998

Mr. Tony McCook Georgia Geologic Survey 19 Martin Luther King, Jr. Dr., SW Room 400 Atlanta, Georgia 30334

RE: Performance Bond for Water Well Contractors and Drillers - 4993104

Dear Mr. McCook:

Enclosed is the original signed copy of the captioned bond. Please call if you have any questions or need further information.

lan

Dean Jobko U Manager, International Risk & Insurance

DJ/aj

Enclosure

perfbnd.doc

cc: Alan Garrard

Sandra J. Mathis Senior Client Administrator

é . . .

J&H Marsh & McLennan 191 Peachtree Street, N.E. Suite 3400 Atlanta, GA 30303-1762 (404) 586-8378 Fax: (404) 586-8208 Sandra_Mathis@jh.com



January 6, 1998

Mr. Dean Jobko Southern Company Services, Inc. 270 Peachtree Street, N. W. Suite 1900 Atlanta, Georgia 30303

Subject: Performance Bond For Water Well Contractors and Drillers - 4993104

Dear Dean:

Enclosed is the captioned renewal bond in the amount of \$10,000 with an expiration date of **June 30, 2000**, for your further handling.

Thank you and should you have questions, please let me know.

Sincerely,

andra

Sandra J. Mathis Surety

BOND #4993104

AND DRILLERS

WATER WELL CONTRACTOR OR DEILLER

KNOW ALL HEN BY THESE PRESENTS.

WHEREAR, the Water Wall Standards Act of 1985 (Ga. Lowe 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shell fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter smended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of auch procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be wold; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption, or

This bond shall be effective from date of issuence er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Frincipal and Obligee; provided that the rights of the Obligee and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2000-

IN WITHESE WHEREOF the Principal and Suraty have caused these presents to be duly signed and sealed, this <u>6th</u> day of <u>January</u> 1998.



POWER OF ATTORNEY SALCO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE SAFECO PLAZA SEATTLE, WASHINGTON 98185

No. _____ 4363

KNOW ALL BY THESE PRESENTS:

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

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

this <u>17th</u> day of <u>January</u>, 1995.

CERTIFICATE

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

"Article V. Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business ... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

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

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

(i) The provisions of Article V. Section 13 of the By-Laws, and

(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and

(iii) Certifying that said power-of-attorney appointment is in full force and effect.

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

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

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



Southern Company Services, Inc. 64 Perimeter Center East Atlanta. Georgia 30346 Telephone (404) 393-0650



June 23, 1994

Mr. Michael Laitta State of Georgia - Environmental Protection Department Room 400 19 Martin Luther King, Jr. Drive Atlanta, GA 30334

RE: Southern Company Services, Inc. Water Well Contractors & Drillers Performance Bond

Dear Mr. Laitta:

Please find enclosed a renewal of the captioned bond. If you have any questions or need further information, please call me at (404)668-3274. Thank you.

Sincerely,

Dean Jobko Sr. Risk Management Analyst

DMB300

cc: Alan Garrard

PERFORMANCE BOND FOR WATER WELL CONTRACTORS

BOND #4993104

AND DEILLERS

WATER WELL CONTRACTOR OR DRILLER

KNOW ALL HEN BY THESE PRESENTS.

That we SOUTHERN COMPANY SERVICES, INC. and SAFECO TRSUMANCE CUMPANY OF AMERICA are held and firmly bound unto the Director of the Environmental Protection Division ("Director"), Department of Matural Resources, fata of Georgia and his successor or successors in office, as Obligae, in the full sum of TEN THOUSAND & No/100 Dollars (\$10,000.00). for the payment of which well and truly to be made, we bind curselves, our heirs, executors, administrators, successors and assigns, jointly and saverally, by these presents.

WHEREAS, the Veter Well Standards Act of 1983 (Ge. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendmant to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendmant, adoption, or modification.

This bond shall be effective from date of issuance er, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obliges; provided that the rights of the Obliges and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 1997.

	\bigcirc	
SAFECO®	POWER OF ATTORNEY	SAFECO INSURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE SAFECO PLAZA SEATTLE, WASHINGTON 88185
84 8		No. 4363
KNOW ALL BY THESE PRESENTS:		

That SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby appoint ******C. A. DRIVER; DEANNA L. FULTON; SANDRA J. MATHIS; EDWARD L. MITCHELL, Atlanta, Georgia****

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

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

	this	26th	day of	October	, 19 <u>93 _</u> .
وير المسينة المستند المستند المستند				یادی با میشر از میدی برین ب	

CERTIFICATE

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

"Article V. Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business . . . On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimite thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking,"

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

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

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

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

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

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

		this	19th	day of	May	19 <u>94</u> .
	$= \sqrt{-1} \frac{1}{2} \frac{1}$					
	28. 1980 - S	100 (1005) (100 (100) (100)				
		Ei er Statu				
S-974/EP 1/93	·				Registered trademark of 1	SAFECO Corporation.

Groundwater Monitoring Plan Georgia Power Company ■ Plant Bowen CCR Landfill September 2022 ■ WSP USA Project No. 6122160287

ATTACHMENT A3

SURVEYOR'S CERTIFICATION

			Wood PLC			10	
		Plant	Bowen-Euharle	e, Ga.			
		MONITO	RING WELL SUR	VEY DATA			
			March 23, 2021	L			
		DGA JO	B # 6620-003-D	1, C1399			
WELL ID	NORTHING EASTING ELEVATIONS						
			GROUND	NAIL	TOP OF	TOP OF	
			ELEVATION	IN CONCRETE	WELL PAD	CASING	
	1						
GWC-8RR	1502857.71	2073501.74	698.96	699.33		701.92	
GWC-8Z	1502827.67	2073526.15	698.68	699.03		702.09	
GWC-6RZ	1502502.00	2072900.50	728.66	729.07		731.91	
GWC-7Z	1502640.13	2073193.22	709.70	710.04		713.04	
GWC-6	1502520.08	2072962.89	725.97		726.32	728.64	
GWC-5	1502341.56	2072677.44	735.11		735.19	737.56	
GWA-3A	1502374.48	2072061.21	728.68	728.79		731.68	
GWA-4RZ	1502238.85	2072329.55	740.04	740.34		742.84	
GWA-4	1502241.02	2072318.24	740.40		740.57	743.06	
GWA-4R	1502246.31	2072317.15	740.65	740.82		743.23	
GWA-50	1502154.80	2072442.13	728.74		728.84	731.21	
GWA-50R	1502150.85	2072448.35	727.87		728.08	730.37	
SPRING WELL	1506642.00	2075342.34	652.80				
GWC-25R	1506494.89	2075088.90	673.59		673.91	676.42	
GWC-18R	1506301.39	2072929.47	718.97	719.2		721.76	
GWC-18	1506306.70	2072929.28	718.92	719.12		721.88	
GWA-39RZ	1502618.73	2071164.20	729.57	730.1		732.62	
GWA-39Z	1502655.66	2071120.65	731.80	732.49		735.15	
GWC-13RZ	1503926.70	2073517.44	681.71	682.09	_	684.60	
GWC-13R	1503908.53	2073501.95	683.17		683.77	685.97	
GWC-13	1503898.17	2073495.16	684.19		684.62	686.76	
GWC-12	1503662.54	2073693.63	674.66		675	677.25	
GWC-11R	1503395.25	2073828.03	675.98		675.6	677.73	
GWC-11	1503390.40	2073829.95	675.04		675.45	677.83	
GWC-10R	1503154.01	2074020.44	685.33		685.95	687.95	
GWC-10	1503162.70	2074019.96	684.89		685.05	687.87	
GWC-9	1503018.96	2073781.05	691.99		691.93	694.67	
GWA-2R	1502615.38	2071965.52	732.66		732.26	734.83	
GWA-2	1502640.55	2071935.13	731.48		731.56	733.89	
GWA-1	1502842.29	2071724.15	738.86		738.99	741.76	
GWA-40	1503195.09	2071299.94	728.93	728.97		731.77	
GWA-41R	1503527.39	2071050.84	737.95	740.13		743.08	
GWA-41	1503519.02	2071046.18	738.91	739.32		742.35	
GWA-42	1503823.34	2071049.95	734.45	735.11		738.05	
GWA-43R	1504117.39	2070973.14	707.80	708.14		711.19	
GWA-43	1504129.20	2070982.44	707.61	707.93		710.94	
GWC-44	1504436.66	2071414.30	710.15	710.13		712.89	

-						
GWC-45	1504539.38	2071956.71	698.41	698.8		701.53
GWC-45R	1504538.68	2071945.39	699.00	399.6		702.02
GWC-46R	1504522.23	2072184.47	687.94	688.18		690.49
GWC-47R	1504539.25	2072467.10	687.71	687.96		691.13
GWC-47	1504543.69	2072481.34	687.44	687.7	1	690.86
GWC-48	1504490.63	2072851.71	686.20	686.31		688.33
GWC-49Z	1504238.30	2072896.49	706.12	706.48		709.11
GWC-49R	1504246.02	2072918.76	706.24	706.39		709.56
GWC-15R	1503936.17	2072919.39	693.39		693.72	696.13
GWC-15	1503943.59	2072927.52	692.75		693.2	695.19
GWC-15Z	1503952.26	2072918.71	693.28	693.43		695.92
GWC-14Z	1504060.77	2073193.66	684.34	684.63		687.28
GWC-14	1504059.92	2073205.96	684.04		684.16	686.81
GWA-36R	1505051.72	2073384.47	681.41	681.39		684.16
GWA-36	1505057.77	2073384.03	681.89	681.94		684.50
GWA-37	1505345.45	2073069.32	700.44	701.08		703.72
GWA-38	1505501.33	2072831.77	713.32	713.6		716.24
GWC-24R	1506694.13	2074806.11	673.76	673.94		676.57
GWC-16R	1505877.86	2072607.38	727.77	727.87		730.59
GWC-17R	1506069.29	2072829.29	730.02	730.29		733.37
GWC-19R	1506395.96	2073158.36	723.13	723.63		726.31
GWC-20R	1506602.14	2073486.53	717.63	717.88		720.59
GWC-21R	1506695.89	2073784.42	720.45	720.47		723.07
GWC-22R	1506717.93	2074105.65	712.54	712.84		715.41
GWC-23R	1506701.61	2074446.53	688.02	688.41		690.94
GWA-56	1506128.38	2074633.08	689.14	689.25		692.17
GWA-55R	1506041.22	2074517.62	693.28	693.75		696.53
GWA-55	1506034.69	2074507.04	693.43	693.9		696.72
GWA-54	1505853.39	2074286.28	701.23	701.3		704.23
GWA-53	1505695.52	2074038.90	707.61	707.95		710.99
GWA-53R	1505689.06	2074032.00	708.38	708.45		711.58
GWA-52	1505459.85	2073876.00	706.56	706.78		709.77
GWA-51RZ	1505310.36	2073781.34	705.81	705.89		708.58
					· · · ·	
COORDINATES ARE GA STATE PLANE, WEST ZONE, NAD 83.						
ELEVATIONS ARE BASED ON NAVD 88.						

Survey data shown below has a horizontal positional tolerance of +/-0.5 feet and a

vertical positional tolerance of +/- 0.01 feet at the 95% level of confidence.

Equipment used to obtain horizontal and vertical coordinates was a LEICA SYSTEM 1200 GPS RECEIVER WITH A LEICA RX1200 DATA COLLECTOR.

Benchmark used to establish horizontal and vertical positions was established from LEICA SMARTNET REAL TIME NETWORK.



		· · · · · ·	Wood PLC				
Plant Bowen-Euharlee, Ga.							
			July 7, 2021				
		DGA JOI	B # 6620-003-D	1, C1399			
WELL ID	NORTHING	EASTING	ELEVATIONS				
			GROUND	NAIL	TOP OF	TOP OF	
			ELEVATION	IN CONCRETE	WELL PAD	CASING	
		·					
GWA-36RA	1505060.13	2073365.45	682.26	682.50	n/a	685.20	
COORDINATES	COORDINATES ARE GA STATE PLANE, WEST ZONE, NAD 83.						
ELEVATIONS ARE BASED ON NAVD 88 DATUM.							
Survey data sh	nown below has a	horizontal positic	onal tolerance of	f +/-0.5 feet and a	1		
vertical positio	nal tolerance of +/	/- 0.01 feet at the	95% level of co	onfidence.			
Equipment use	ed to obtain horizc	ontal and vertical	coordinates was	s a LEICA SYSTE	EM 1200 GPS R	ECEIVER	
WITH A LEICA	A RX1200 DATA (SOLLECTOR.					
Benchmark us	ed to establish hc	prizontal and verti	ical positions wa	as established from	m LEICA SMAR	TNET REAL	

TIME NETWORK.



			Wood PLC			1 m m	
		Plant	Bowen-Euharle	e, Ga.			
		MONITOF	ING WELL SUR	VEY DATA			
		1	March 22, 2022	2			
		DGA JOF	3 # 6620-003-D	1, C1399			
WELL ID	NORTHING	EASTING	ELEVATIONS				
			GROUND	NAIL	TOP OF	TOP OF	
			ELEVATION	IN CONCRETE	WELL PAD	CASING	
C11/4 2 C4	4505000.05	2072257.46	600.60	600.05			
GWA-36A	1505026.95	20/335/.46	680.63	680.85	n/a	683.75	
	2						
COORDINATE	S ARE GA STATE PI	ANE, WEST ZON	E, NAD 83.				
ELEVATIONS ARE BASED ON NAVD 88 DATUM.				Alex That you B			
Survey data sl vertical positic Equipment us WITH A LEIC,	nown below has a nal tolerance of +/ ed to obtain horizo A RX1200 DATA (horizontal positio - 0.01 feet at the intal and vertical COLLECTOR.	nal tolerance o 95% level of co coordinates wa	f +/-0.5 feet and a onfidence. s a LEICA SYSTE	EM 1200 GPS RI		

TIME NETWORK.



B. GROUNDWATER MONITORING WELL DETAILS

B1. GROUNDWATER MONITORING WELL DETAIL POST TYPE SURFACE COMPLETION



B2. GROUNDWATER MONITORING WELL DETAIL FLUSH-MOUNT SURFACE COMPLETION



C. GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling will be conducted using USEPA Region 4 Field Branches Quality System and Technical Procedures - Science and Ecosystem Support Division groundwater sampling procedure SESDPROC-301-R4 and updates as a guide. The following procedures describe the general methods associated with groundwater sampling at the Site. Prior to sampling, the well must be evacuated (purged) to make certain 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 or its contractor 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. 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. The water measuring device shall consist of a probe and measuring tape capable of measuring water levels with accuracy to 0.01 feet.
- 3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two (2) feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth of the pump intake once positioned. All non-dedicated pumps and wiring will be decontaminated before use and between well locations using procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency Laboratory Services and Applied Science Division (LSASD) Operating Procedure for Field Equipment Cleaning and Decontamination (LSASDPROC-205-R4 June 22, 2020) and updates as a guide.
- 4. Measure Water Level: Immediately prior to purging, measure the water level again with the pump in the well. Leave the water level measuring device in the well.
- 5. Purge Well: Begin pumping the well at approximately 100 to 500 milliliters per minute (ml/min). Monitor the water level continually. Maintain a steady flow rate that results in a stabilized water level with 0.3 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:

- pH ±0.1 Standard Units (S.U.)
- Specific Conductance ±5% (conductivity)
- DO ±10 percent or ±0.2 milligrams per liter (mg/L) (whichever is greater) for DO where DO> 0.5 mg/L. If DO< 0.5 mg/L no stabilization criteria apply.
- Turbidity measurements ≤ 5 nephelometric turbidity units (NTUs) or between 5 and 10 NTUs after 3 hours of purging.
- Temperature Record only, not used for stabilization criteria
- ORP Record only, not used for stabilization criteria.
- 7. Collect samples at a low-flow rate according to the most current version of USEPA Region 4 SESD guidance document, Operating Procedure Groundwater Sampling (EPA, SESDPROC-301-R4), and such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.
- 8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results, duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.
- 9. All sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.
- 10. Sample containers and preservative will be appropriate for the analytical method being used.
- 11. Information contained on sample container labels will include:
 - a. Name of facility
 - b. Date and time of sampling
 - c. Sample description (well number)
 - d. Sampler's initials
 - e. Preservatives
 - f. Analytical method(s)

- 12. After samples are collected, samplers will remove all non-dedicated equipment. Upon completion of all activity the well will be closed and locked.
- 13. Samples will be delivered to the laboratory following appropriate chain-of-custody (COC) and temperature control requirements. The goal for sample delivery will be within 48 hours of collection; however, at no time will samples be analyzed after the method-prescribed hold time.

Throughout the sampling process new 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 NTUs; however, samples may be collected where turbidity is less than 10 NTUs and the stabilization criteria described above are met.

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

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

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

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

D. SURFACE WATER SAMPLING AND ANALYSIS PROCEDURES

Surface water samples will be collected in accordance with the general procedures outlined below if flowing water is observed at each sampling location. These procedures were developed using field sampling guidelines described in the USEPA Region 4 Laboratory Services and Applied Science Division (LSASD) Operating Procedure for Surface Water Sampling (LSASDPROC-201-R5) and updates.

A small spring at the northeastern edge of Cells 3 & 4 will be monitored for the same parameters and at the same frequency as groundwater. The spring may not discharge water during the drier times of the year. When water is flowing from the spring, it will be sampled. The spring water samples will be analyzed for the same parameters using the same analytical methods as the groundwater samples listed in **Tables 2 and 3** of this plan. The minimum sampling frequency for surface water will be semi-annual; provided water is flowing from the spring.

Surface water samples will be collected from the flowing water of the spring and not from ponded water collected on the ground surface. If a dipper or other transfer vessel other than the sample container is used, it must be composed of a non-porous inert material such as glass, PVC, polyethylene, or stainless steel and decontaminated before use. The following procedures will be used to collect surface water samples:

- a. Hold the bottle near the base of the flow with one hand, and with the other, remove the cap.
- b. Rinse the sample container with the water to be sampled prior to filling the container, unless the sample containers are pre-preserved. Pre-preserved sample containers should not be rinsed prior to sampling.
- c. Hold the container partially submerged within the stream flow and allow the container to be filled with water. Remove the container from the flow and place the cap back on the container.
- d. Label the sample container, at a minimum, to include: Sample Number, Name of Collector, Date and Time of Collection, and Place/Point of Collection.
- e. Place the samples in a cooler containing water-ice, if required, for courier or hand delivery to the laboratory within the sample hold times.
- f. Follow COC and temperature protocols.