



Hydrogeologic Assessment  
River Bend Quarry  
Spartanburg County, South Carolina  
S&ME Project No. 22610504

PREPARED FOR:

River Bend Aggregates, LLC  
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October 5, 2023



October 5, 2023

River Bend Aggregates, LLC  
500 Duke Drive  
Franklin, Tennessee 37067

Attention: Mr. Jack Mitchell ([jmitchell@synergy-materials.com](mailto:jmitchell@synergy-materials.com))

Reference: **Hydrogeologic Assessment**  
**River Bend Quarry**  
Pacolet, Spartanburg County, South Carolina  
S&ME Project No. 22610504

Dear Mr. Mitchell:

S&ME, Inc. has completed a Hydrogeologic Assessment for the referenced property (i.e., the subject property). The attached report presents the findings of the Hydrogeologic Assessment, which was performed in general accordance with S&ME Proposal No. 22610504A, dated January 5, 2023.

S&ME appreciates the opportunity to provide this Hydrogeologic Assessment for this project. Please contact us at your convenience if there are questions regarding the information contained in this report.

**Sincerely,**

A handwritten signature in black ink that reads "Edmund Q.B. Henriques".

Edmund Q.B. Henriques, LG (NC)  
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A handwritten signature in blue ink that reads "Nathan Williams".

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## 1.0 INTRODUCTION

S&ME, Inc. (S&ME) conducted a Hydrogeologic Assessment of the River Bend Quarry site, hereafter referred to as the subject property, located southwest of Hammett Grove Road and northeast of the Pacolet River near Pacolet, Spartanburg County, South Carolina. A site vicinity is shown on **Figure 1, Appendix I**. The Hydrogeologic Assessment was conducted in general accordance with S&ME, Inc. Proposal No. 22610504A, dated January 5, 2023.

### 1.1 Purpose

S&ME understands that River Bend Aggregates, LLC is considering the purchase of the subject property for the purpose of developing the property as an aggregate mine. The mining operations will use dry mining techniques; therefore, the proposed mining area will be dewatered via groundwater extraction points/sumps. The purpose of the hydrogeologic assessment was to provide information on certain recognized hydrogeology features of the site and vicinity, inferred locations of on-site water bearing fractures, registered off-site water supply wells in the vicinity of the site, and to assess aquifer properties for the development of estimated probable impacts of mine dewatering activities.

### 1.2 Methodology

This hydrogeology assessment relied on a process that began with the development of a preliminary conceptual site model. The preliminary model was based on known or expected primary features of geology, hydrogeology, mine pit location and development, and site-specific relationships between geologic structures and groundwater flow. The preliminary conceptual site model was utilized to develop field data collection needs for this assessment. The collected data included geologic, geophysical, and hydrogeologic information. Site specific data was then collected to further characterize the hydrogeologic system and the resultant data analyzed to refine the conceptual site model. A computer aided mathematical model was then employed to provide predictive simulations of effects of future mine dewatering scenarios.

## 2.0 Site Setting

The approximately 443-acre site is located southwest of Hammett Grove Road and northeast of the Pacolet River near Pacolet, Spartanburg County, South Carolina. The site is comprised of all or a portion of seven Spartanburg County tax parcels. The parcels are identified as parcel number 3-25-00-007.00 (1010 Hammet Grove Road) owned by Donna K. Martin (1.90 acres), and portions of two parcels owned by Wiley Fork Legacy LLC, including parcel number 3-25-00-006.00 (534.1 total acres) and parcel number 3-25-00-010.00 (94.61 acres), parcel numbers 3-25-00-014.00 (2.0 acres), 3-25-00-14.01 (5.0 acres), and 3-25-00-014.02 (8.3 acres) owned by Brett Spencer, and parcel number 3-225-00-013.02 (13.26 acres) owned by Joseph Sonefeld.

Current uses reported for the property by S&ME for the Phase I Environmental Site Assessment (ESA), dated December 14, 2022, were wooded land, open areas, and a residence. The residence located on the Property uses a drinking water well and a septic system. A cemetery was observed on the eastern portion of the property. A small shooting range was observed on the northern portion of the property. Historical resources reviewed for the ESA indicated the property has consisted of wooded land or open/cut-over land since at least 1938. Based on



historical aerial photography, a residence has been present on the eastern portion of the property since at least 1994.

The subject site is identified on the United States Geological Survey (USGS) 7.5-minute series Topographic Maps titled Pacolet, South Carolina Quadrangle, dated 1983. The original map has a scale of one-inch equals 2,000 feet. A portion of the USGS Topographic Map covering the site and vicinity is included as **Figure 2, Appendix I**. Topography on the property is undulating and slopes to multiple on-site drainage features that slope generally towards the Pacolet River, which adjoins the property to the west, south, and southeast. Surface elevations on the subject site range from approximately 720 feet to 520 feet above Mean Sea Level.

Properties surrounding the subject site consist of forestland and residential land.

## 2.1 Planned Quarry Operations

The planned mining operations will take place in the southern and western portions of the subject property with the land north of the pit and plant to be used for overburden storage. The primary infrastructure (i.e., settling ponds, clean water pond, pumps, etc.) for the facility will be north and east of the proposed mine pit. The entrance to the mine facility will be from Hammett Grove Road to the east of the site and will extend to the primary infrastructure area northeast of the proposed pit areas. S&ME understands that mining operations have not been planned for specific depths or time frames. S&ME is currently preparing a groundwater modeling report, which will include a simulation of predicted groundwater drawdown, in response to proposed mine dewatering operations. The model will be used by Riverbend Aggregates, LLC to aid in establishing final pit expansion phases, an estimated mine total depth and final pit configurations. The expected life of any aggregate mine operation is primarily driven by economic factors, such as demand for the product, which is difficult to predict. A mine life forecast of 75 years or less would be foreseeable.

Please reference **Figure 3, Appendix I** regarding the planned operations.

## 2.2 Geology and Lineament Mapping

### 2.2.1 Geology

According to the *Geology of the Carolinas*, (Horton, Jr. J. Wright and Zulu A. Victor, University of Tennessee Press, 1991), the Property lies in the Piedmont Physiographic Province. The Piedmont is characterized by rolling relief drained by numerous creeks. Generally, soils in the Piedmont form by the weathering of the underlying rock. Parent material is felsic/mafic residuum weathered from metamorphic and igneous rocks. In the general vicinity of the subject site, the soils consist of 0 percent to 25 percent sloping sandy loam, sandy clay loam, clay loam and fine sandy loam.

**Figure 4, Appendix I** represents a portion of the South Carolina Geological Survey, *Geologic Map of the Pacolet Quadrangle, Spartanburg and Cherokee Counties, South Carolina (2000)*, with mapped local geologic units in the vicinity of the subject site shown. According to this map and accompanying *Description of Map Units*, the subject site and vicinity are likely underlain by the following rock type.

- Southeast portion of Property: Monzogranite (Dpmmg), fine-to medium-grained, of the Pacolet Mills Pluton, Devonian.



- Central portion of Property: Porphyritic Granodiorite (Dpmgd), medium- to coarse-grained, of the Pacolet Mills Pluton, Devonian.
- Northwest portion of Property: Biotite Gneiss (bgn), fine- to medium- grained, mainly thin bedded, of the Inner Piedmont Terrane, Laurens Thrust Sheet of the Pacolet Mills Pluton, Devonian.
- Pacolet River floodplain: Quaternary alluvium \*(Qal), fluvial sediments.

A review of core drilling data recorded by Randall Mining Consultants (GWPD22-01, GWPD22-02, GWPD22-03, GWPD22-04) indicated that the site is underlain by bedrock primarily described as amphibolite gneiss and meta-granite, with possible pegmatites and quartz/feldspar lenses.

Based on the core drilling data, the thickness of the soil/saprolite overburden ranged from a depth of 30 feet to 50 feet below grade (BG). The apparent soil saprolite overburden thickness observed during installation of monitoring wells associated with pump testing ranged from approximately 55 feet BG to 118 feet BG.

### 2.2.2 *Lineament Study*

Fractures are often the primary sources of permeability in crystalline bedrock aquifers. When these features cannot be observed directly, they can often be inferred by examining topographic maps, aerial and satellite images. As an ancillary tool for predicting the location of possible geologic structures in the study area, a lineament (or fracture trace) study was prepared. The lineament study entailed a qualitative and subjective visual analysis of the topographic map features in the study area and surrounding vicinity, searching of apparent linear features (i.e., lineaments) embedded in the map data. For example, straight stream segments or draws arranged in somewhat parallel patterns or aligned at roughly 90-degree angles to main streams may indicate that the drainage features would be controlled by high-angle fractures. Other non-man-made linear features may also provide indications of the structural fabric and compositional variations in the underlying bedrock.

As depicted in **Figure 5, Appendix I**, the recognized lineaments are generally oriented north 30 to north 55 degrees east, north 10 to north 45 degrees west. The lineaments identified may be indicative of geologic structures or zones of contrasting strength due to differences in the composition of adjoining rock types. Lineaments and lineament intersections can represent possible targets for water well drilling, and/or identify areas warranting further examination during hydrogeologic studies. Considering the map scale used for this lineament study, fractures inferred by this method may or may not directly underlie the lines shown. Because a lineament study is a qualitative analysis, the actual presence and dip of features cannot be determined without additional investigations.

## 2.3 **Hydrogeology**

The hydrogeology of the Piedmont is typically characterized by surficial soils underlain by a weathered rock zone referred to as saprolite, which can range from a few feet to tens of feet thick. The saprolite transitions into bedrock with increased depth. In places, the lowermost portion of saprolite transition zone, just above bedrock, can be more permeable. Groundwater within the Piedmont generally moves from topographically high areas (recharge zones) to topographically low areas within and along stream valleys (discharge areas). Pacolet River, and its unnamed tributaries that bisect portions of the site, are the expected discharge zones for the shallow saprolite aquifer beneath the site.

The conceptual site model presented below provides further discussion of local hydrogeology.

## 2.4 Conceptual Site Model

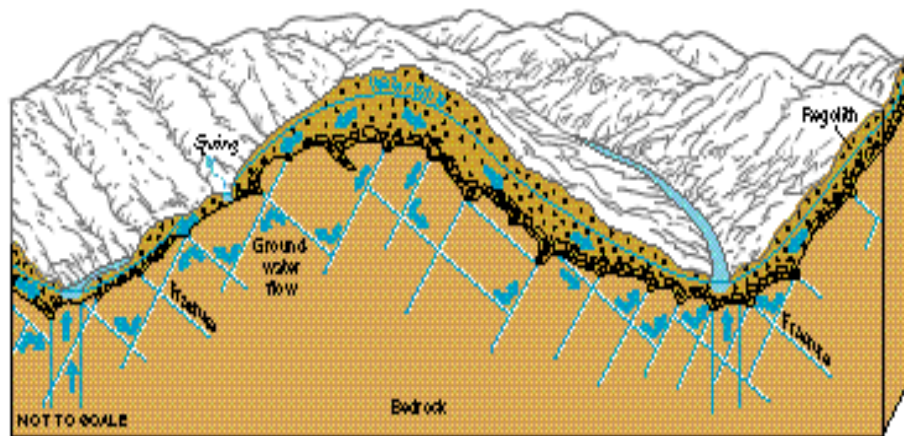
The generally accepted model for the Piedmont aquifers is a two layered system, built on the premise of an unconsolidated layer of soil and saprolite containing an unconfined aquifer that has a relatively high storage capacity supplying water to an underlying variably fractured crystalline bedrock aquifer that has low overall porosity and storage (Heath 1989). The low overall porosity and storage are due to the dense, somewhat impermeable bedrock that yields water primarily from secondary porosity and permeability provided by fractures, faults, joints, and foliations. The saprolite aquifer and bedrock fractures zone are common targets for residential, industrial and irrigation water wells. It is important to emphasize that crystalline bedrock aquifers are irregular and heterogeneous in distribution, often highly localized, and exhibit discontinuous water bearing zones.

Although far more complex, the local aquifer system can be conceptually simplified and viewed as a two-layered system consisting of a shallow, unconsolidated, unconfined, porous regolith aquifer that can supply water to surface water features and to the second layer, the underlying fractured bedrock aquifer as depicted in Figure 2-1.

Aquifer recharge in the Piedmont region is provided by precipitation which occurs in the form of rainfall and snow melt. Depending on factors such as ground saturation, ground cover and slope, a portion of the precipitation forms runoff. This runoff flows to areas of lower elevation where some of the runoff water infiltrates in the unconsolidated material (i.e. soil), and some of the water flows into local surface waters. The precipitation that does not form runoff infiltrates through the unsaturated zone where it can merge with underlying aquifers.

Most of the recharge in this region takes place in inter-stream areas. In general, recharge from precipitation enters the aquifer system through the saprolite zone. It is believed that much of the recharge water moves laterally through the saprolite zone and discharges to nearby streams. Under some conditions shallow groundwater can discharge at the ground surface down slope as seeps or permanent springs above these surface water bodies. Some of these seeps may occur on a seasonal basis or as short-term temporal responses to precipitation. This unconfined saprolite aquifer is generally expected to function as a storage reservoir for the underlying fractured bedrock aquifer.

**Figure 2-1 Simplified Illustration of Groundwater Movement**



Heath 1980



Some of the water moves vertically downward through the saprolite until it reaches bedrock where it enters fractures in the crystalline rock. Groundwater within the consolidated fractured bedrock aquifer flows in accordance with hydraulic (i.e., pressure) gradients in the fracture network. Because of this, the groundwater does not necessarily flow in the direction of topographic gradients. Based on the site geology and Very Low Frequency (VLF) imaged fractures, flow likely occurs along rock fabric and fracture zones. Significant fracture zones have the potential to substantially influence groundwater flow and velocities.

Published geologic data, lineament study findings, site geologic data, and the VLF survey findings were reviewed for the selection of test well and observation well locations.

## 3.0 Water Well Inventory

### 3.1 Freedom of Information Request

On January 18, 2023, S&ME requested to review available environmental regulatory files pertaining to water supply wells located in Spartanburg County from the South Carolina Department of Health and Environmental Control (SCDHEC) through its Freedom of Information (FOI) office. The Freedom of Information Request Form is included in **Appendix II**. On March 2, 2023, S&ME received two spreadsheets (General Query Spartanburg.xlsx and WellTrak Query Spartanburg.xlsx) containing information regarding registered water supply wells in Spartanburg County, South Carolina.

In an electronic mail message from the SCDHEC Bureau of Water Private Well Program to S&ME during 2021, we understand that the older of the two database files (WellTrak Query Spartanburg.xlsx) contains wells supposedly installed from 1985 to 2006. SCDHEC did not start permitting wells until 2000. Because of this, older non-permitted wells installed between 1985 and 1999 were given a log number only. Wells noted in the old database that were installed from 2000 to 2006 were permitted and given both a log number and a permit number.

The newer database (General Query Spartanburg.xlsx) has been in use since 2006. When data was being migrated from the old database to the new, the wells with permit numbers (those installed from 2000 to 2006) were included in this new database. This makes for some duplication in the database of wells permitted between 2000 to 2006. From past experience, we understand that wells included in the database are only the wells that were reported and should not be considered a complete inventory of all wells in Spartanburg County.

Due to the volume of information provided by SCDHEC via S&ME's FOI request, the data was not included in this report but can be submitted electronically upon request by S&ME.

A review of database information showed that there are five wells present in the database that are located within a 0.5-mile radius of the proposed mine pit site. The wells are apparent residential water supply wells and are located off Hammett Grove Road and Lucky Lane, are summarized on **Figure 6, Appendix I**. The wells included in the WellTrak Query Spartanburg file range in depth from 67.5 to 360 feet BG.

### 3.2 Local Water Supply Well Registration Data

On October 30, 2020, Mr. Bradley Keyse contacted Spartanburg County and spoke to Ms. Cynthia Veta, Permit Clerk with the Building Codes department, via telephone regarding the availability of water supply well



registration records for Spartanburg County. According to Ms. Veta, well permits and registrations are not handled at the local level and are done by SCDHEC. Based on the information from Ms. Veta, Spartanburg County does not have water supply well registration information.

### 3.3 Site Reconnaissance

During a site reconnaissance performed on September 11, 2023, by Sergey Goretoy of S&ME, evidence of municipal water lines were observed on the roads located within a one-mile radius west, north, and south of the proposed mine site. Fire hydrants were observed along the following roads located at a distance greater than 0.5 mile of the proposed mine pits and are suspected to indicate the presence of municipal water lines.

- ◆ Goldmine Road
- ◆ Hammett Grove Road
- ◆ Sunny Acres Road

S&ME observations indicated the presence of three apparent water well structures located within a 0.5-mile radius of the proposed mine site, and 12 apparent wells structures located between the 0.5-mile and 1-mile radii of the proposed mine site, as summarized on **Figure 6, Appendix I**.

### 3.4 Potential Water Well Observations

On September 13, 2023, S&ME reviewed parcels located with a 0.5-mile radius of the proposed mine pits on the Spartanburg County and the Cherokee County GIS sites. As summarized on **Figure 6, Appendix I**, three parcels with the potential to contain water supply wells not included in the database queries, and not observed during the well reconnaissance were identified.

### 3.5 Water Service Documentation and Client Input

S&ME reviewed the provided ALTA/NSPS Land Title Survey for Synergy Materials, LLC, (Palmetto Corp; August 28, 2023). The survey shows a water line operated by Goucher Water Company terminating on Hammett Grove Road near the intersection of a driveway for 1010 Hammett Grove Road. We understand that the residence located at 1010 Hammett Grove Road, approximately 900 feet north of the proposed pit, is served by public water from the Goucher Water Company. This property was listed in the SCDHEC water well databases reviewed. River Bend Aggregates, LLC informed S&ME that that well will eventually be abandoned.

The database identified the presence of a well at 1170 Hammett Grove Road and S&ME concluded that the structure at 1150 Hammett Grove Road also contained a water well. River Bend Aggregates, LLC will be the owners of these properties and associated water wells. Currently, there are no plans to either abandon or retain these two wells. Both of the properties are shown as sites with a well on **Figure 6, Appendix I**. Goucher Water Company has a public water line that runs south along Hammett Grove Road, and terminates at the driveway for 1010 Hammett Grove Road.

### 3.6 Data Summary

The findings of our water well Survey, including the parcels with water supply wells located within a 0.5-mile radius of the proposed mine pits, are summarized on **Figure 6, Appendix I**. Based on the methods employed and discussed above, eleven known or suspect water supply wells were identified within 0.5-mile radius of the edge of





the proposed mine pits. Of the eleven identified well sites, four are located on the opposite side of the Pacolet River. Of the seven well sites identified on the same side of the river as the proposed quarry, three are located on properties that will be owned by River Bend Aggregates LLC (1010, 1050, and 1070 Hammett Grove Road). The remaining four wells identified are located east of the proposed mine pits.

It should be noted that the well information discussed in Section 3.1 was mapped using addresses provided by the databases or by their georeferenced locations provided by Google Earth®. As such, the well symbols are shown on the parcels of interest to indicate that a well is present on the parcel, but the symbols do not indicate the location of the wells.

## 4.0 Field Methods

### 4.1 Geophysical Survey

The conceptual site model assumed that bedrock fractures would provide primary control over groundwater movement in the bedrock aquifer. Characterization of fractured bedrock aquifers can be aided by the utilization of certain non-invasive geophysical survey tools. For this project, a VLF survey was employed for imaging steeply dipping fractures in the immediate vicinity of the proposed mine site.

S&ME subcontract THG Geophysics for the collection of VLF profile data across select portions of the proposed mine pit. The VLF survey utilizes very low frequency military radio signals to measure electrical properties of near surface soil and shallow bedrock. Electrically conductive features include fault zones and fractures, which tend to be more conductive than the surrounding bedrock. VLF is used to collect conductivity data, which is analyzed for contrasting electrical conductivities among underlying geologic units. The results of the analysis allow identification of more conductive zones (e.g., suspect fracture zones) in the underlying bedrock. The data is collected by walking a series of lines (e.g., profiles) with a backpack VLF receiver and stopping to collect data at points roughly every 10 meters along each line. The location of each data point along the profile is determined and recorded using a non-survey grade GPS. The VLF method is sensitive to cultural interference from items such as pipelines, utilities, fences, and other conductive objects. If observed, cultural features were noted at the time of data collection.

From January 4, 2023, through January 5, 2023, THG Geophysics collected data along five profiles covering approximately 11,550 feet. The profile locations and orientations were selected based on regional and local geologic information, as well as inferences made from the lineament study.

Following field data collection, the VLF data was post-processed. **Appendix III** contains the THG Geophysics report which includes figures illustrating the VLF profiles and the points along each profile where fractures were imaged. The post-processed VLF data was presented in both plan and cross-sectional view to illustrate the interpreted dip of the imaged fractures. The VLF data was examined and utilized to make interpretations of the subsurface fracture patterns within the study area. The green lines depicted in the THG report illustrate the interpreted location and orientation of the imaged fractures, with arrows depicting the dip of these features. Although the lines shown are straight and continuous, actual fracture patterns are not always linear and/or as laterally continuous as shown.



## 4.2 Well Installations

Site-specific field data was collected to verify the conceptual site model or provide data to refine the model. Well drilling locations were selected based on the VLF geophysical survey findings, with goals of installing wells that intersect dominant fractures and developing an observation well network to be used during pump tests for monitoring aquifer responses and estimating aquifer parameters. In selecting drilling locations, consideration was given to anticipated placement of mine infrastructure.

The well network installed provided for one primary pumping well and four observation wells. Well drilling targeted installation of a pumping well in a primary fracture zone and installation of secondary wells (observation wells) intersecting the same apparent fracture zone, but at some distance from the pumping well. An observation well was installed to examine the influences of pumping in the aquifer system away from the fracture zone intersected by the pumping well. Given the orientation and dip of the fractures, this arrangement allowed for the possibility of a single fracture being intersected by two wells located along a line perpendicular to the trace of the fracture. This approach would provide an opportunity to measure hydraulic conductivity along the same fracture, and test the conceptual site model.

Synergy Materials obtained a well installation permit (Permit) from the SCDHEC Mining and Reclamation Program. The permit is included in **Appendix IV**.

Innovative Environmental Technologies, Inc., a South Carolina licensed well driller, installed five 6-inch diameter groundwater monitoring wells, with depths ranging from 400 feet to 404 feet below ground surface. The wells are identified as B1, B1-30, B1-220, B1-100 NE and B1-100 SE. Each well was installed using 6.25-inch diameter air hammer drilling tooling. Depth to bedrock varied from 74 feet below ground surface at well B1-30 to 140 feet below ground surface at well B1-100 NE. Based on the drill cuttings, bedrock encountered consisted primarily of amphibole gneiss, metagranite and metadiorite. Well locations are depicted in **Figure 7; Appendix I. Table 4-1** summarizes the dominant water bearing fracture zones recognized during drilling of monitoring wells.

**Table 4-1 Dominant Fracture Zones Encountered**

Well ID	Depth to Dominant Water Bearing Fractures or Fracture Zones (feet below grade)	Driller Estimate of Well Yield At Time of Drilling (GPM)
B-1	92, 160, 250, 290, 307, 332, 370	8
B1-30	75, 84, 95, 169-172, 210-215, 225, 232, 312, 372, 390	7
B1-220	210, 216, 265, 298, 342	6
B1-100 NE	175, 210, 220, 235, 280, 290, 310, 380	6
B1-100 SE	122, 130, 135, 138, 170, 179, 214, 218, 250, 298-302	50

GPM = gallons per minute

Each bedrock well was constructed using a 6-inch diameter galvanized steel surface casing that extended from less than three feet above grade to the top of bedrock. An inner well casing was not installed into bedrock; the borehole was left open in each well. Each well was secured with a lockable cover.





S&ME documented the installation and development of the groundwater extraction wells, prepared a geologist's log for each well, and developed a well schematic for each well installed. These logs are included in **Appendix IV**. A Water Well Record (SCDHEC Form 1903) was also completed and submitted to the SCDHEC within 30 days of completion of each well. These well records are included in **Appendix IV**.

### 4.3 Aquifer Pump Testing

Aquifer pump testing was performed using the following configurations.

- Well B1: Well B1 was the pumping well, whereas wells B1-30, B1-220, B1-100 NE and B1-100 SE functioned as observation wells. Testing included a variable rate (step) test and a constant rate test.
- Well B1-100 SE: Well B1-100 SE was the pumping well, whereas wells B1-30, B1-220, B1-100 NE and B1-100 SE functioned as observation wells. Testing included a constant rate test.

Details regarding each test are summarized in the following sections.

#### 4.3.1 Variable Rate Test – Well B1


On March 22, 2023, to determine the target flow rate for the constant rate aquifer pumping test, S&ME conducted a variable flow rate pump test (step test) on the pumping well (B1). A submersible electric pump was installed on a 1-inch diameter galvanized pipe and positioned at a depth of approximately 350 feet BG. A flow control device was installed on the discharge line to adjust and control flow rates. A digital flow meter capable of providing instantaneous flow rate data and flow totalizer data was installed to document flow rates and the total volume of water pumped. After the pump and discharge were configured, S&ME installed a Level Troll 700® pressure transducer/datalogger into the pumping well to collect height of water column data during the step test, from which drawdown levels were calculated.

The pump test began with an initial flow rate of 2 gpm, which was maintained using the flow control valves. The pumping rate increased to 4 gpm and 6 gpm until the flow meter required replacement after approximately 1.5 hours. The pump was subsequently operated at 6 gpm for approximately 51 minutes, during which the change in drawdown in the pumping well became asymptotic. The flow rate was increased to 8 gpm and maintained at this rate for approximately 93 minutes, during which the change in drawdown in the pumping well became asymptotic. The flow rate was increased to approximately 10 gpm and maintained for 59 minutes, during which the change in drawdown in the pumping well became asymptotic. The flow rate was increased to approximately 12 gpm and maintained for 58 minutes, during which the change in drawdown in the pumping well became asymptotic. Approximately 415 minutes after starting the test, the flow rate was increased to 13.4 gpm, the apparent capacity of the pump under the current head conditions. *The rate of drawdown increased; however, the rate of change observed at greater than 12 gpm suggested that it was likely to produce drawdown that would exceed the available water column during the pending constant rate test.* The pumping rate was lowered to 10 gpm and the step test was terminated approximately 445 minutes after starting the test, given that data obtained by the pump test was sufficient for planning the pending constant rate test.

The drawdown data collected and recorded by the transducers was analyzed following the test. Based on an analysis of the flow rate employed and drawdown data obtained, a target flow rate of 10 gallons per minute was selected for the constant rate pumping test. A chart depicting the pressure transducer data collected at pumping well B1 during the step test is included in **Appendix V**.

### 4.3.2 Constant Rate Pumping Test – Well B1

From March 22 through March 23, 2023, a constant rate pumping test was performed using well B1 as the pumping well and wells B1-30, B1-220, B1-100 NE and B1-100 SE as observation wells. This test was configured and conducted in an equivalent manner to the step test, though the pumping rate would be constant at 10 gpm. The same submersible electric pump installed on a 1-inch diameter galvanized pipe and positioned at a depth of approximately 350 feet BG was used for the constant rate pump test. The flow control device and electronic flow meter utilized during the other tests was employed during the constant rate test. **Figure 7, Appendix I** depicts the well locations.

		Date 3/24/2020
		Photograph
<b>Location / Orientation</b>	Typical Pump Test Setup	
<b>Remarks</b>	Flow Control Device, Flow Meter, and Discharge Line	

Prior to starting the pump test, S&ME installed Level Troll 700® pressure transducers in the pumping well (B1) and in four observation wells. These transducers were set to record height of water column data during the pump test, from which drawdown levels were calculated. In addition to transducer data, manual water level readings were collected from each of the observation wells during the test. **Table 4-2** provides a summary of the transducer types, locations deployed, and logging intervals utilized.

**Table 4-2 Transducers, Device Type, and Logging Intervals**

Well ID	Device Type	Logging Interval (minutes)
B1 (Pumping Well)	LevelTROLL 700®	30 second
B1-30, B1-220, B1-100 NE and B1-100 SE (Observation Wells)	LevelTROLL 700®	5 minutes

Maximum drawdown observed in each of the wells is summarized in **Table 4-3** below:



**Table 4-3 Summary of Maximum Drawdown**

Well ID	Maximum Drawdown During Pump Test (feet)
B1 (Pumping Well)	51.5
B1-30 (Observation Well)	3.1
B1-100 NE (Observation Well)	3.5
B1-100 SE (Observation Well)	2.5
B1 220 (Observation Well)	2.0

The pumping phase for the constant rate test was run for approximately 24 hours, with pumping terminated at 9:15 AM on March 23, 2023. The pump rate was held generally constant throughout the test at approximately 30 gpm, with a total of 14,420 gallons pumped from the well during the test.

After the pumping phase of the test was completed and the pump was deactivated, the transducers in each of the wells continued to record data during the aquifer recovery phase, to monitor post-pumping water level responses at the pumping and observation wells. On March 24, 2023, around 9 PM, the transducer logging was terminated, and the transducers were removed from the wells. Rainfall events occurred during the pumping phase of the test, but not during the recovery phase. Charts depicting pump test drawdown data collected are included in **Appendix V**. Drawdown data obtained for each of the five wells utilized for the constant rate pump test were subsequently analyzed as part of the groundwater modeling task.

#### 4.3.3 *Constant Rate Pumping Test –Well B1-100 SE*

On March 24, 2023, a constant rate pumping test was performed using well B1-100 SE as the pumping well and wells B1, B1-30, B1-100 NE and B1-220 as observation wells. This test was configured and conducted with a pumping rate that would be constant at approximately 30 gpm and 25 gpm, based on well yield observations made at the time of well installation. A submersible electric pump installed on a 1-inch diameter galvanized pipe and positioned at a depth of approximately 200 feet BG was used for this shorter duration constant rate pump test. The flow control device and electronic flow meter utilized during the other pump tests were employed during this test. **Figure 7, Appendix I** depicts the well locations.

The Level Troll 700® pressure transducers installed for the prior test were utilized again during this test. The transducers were set to record height of water column data during the pump test, from which drawdown levels were calculated. In addition to transducer data, manual water level readings were collected from the observation wells during the test. **Table 4-4** provides a summary of the transducer types, locations deployed, and logging intervals utilized.

**Table 4-4 Transducers, Device Type, and Logging Intervals**

Well ID	Device Type	Logging Interval (minutes)
B1-100SE (Pumping Well)	LevelTROLL 700®	30 second
B1, B1-30, B1-100 NE, B1-220 (Observation Wells)	LevelTROLL 700®	5 minutes



Maximum drawdown observed in each of the wells is summarized in **Table 4-5** below:

**Table 4-5 Summary of Maximum Drawdown**

Well ID	Maximum Drawdown During Pump Test (feet)
B1-100 SE (Pumping Well)	2.4
B1 (Observation Well)	1.7
B1-30 (Observation Well)	2.3
B1-100 NE (Observation Well)	0.5
B1-220 (Observation Well)	0.3

The pumping phase for the constant rate test was run for approximately 5.25 hours. The initial pumping rate was approximately 30 gpm for 23 minutes. The pumping rate was adjusted to approximately 25 gpm and held generally constant for five hours at 25 GPM. Based on the totalizing flow meter, a total of 9,426 gallons were pumped from the well during the test.

After the test was completed and the pump was deactivated, the transducers in each of the observation wells continued to record data during the aquifer recovery phase, to monitor post-pumping water levels responses at the pumping and observation wells. On March 29, 2023, the transducer logging was terminated, and the transducers were removed from the wells. Charts depicting pump test drawdown data collected are included in **Appendix V**.

Drawdown data obtained from each pump test will be analyzed as part of the pending groundwater modeling task, to be reported under separate cover.

### 6.3 Significant Assumptions

- The assessment assumes that the proposed mine pit and operations would be configured as provided by River Bend Aggregates, LLC and outlined in this report.
- Aquifer parameters estimated with pump test, are generally representative of the area to be influenced by dewatering of the mine pit during active operations.

### 6.4 Limitations and Exceptions of Assessment

- Information obtained regarding off-site water supply wells was limited to that provided by the South Carolina Department of Health & Environmental Control, and interpretations made by S&ME using aerial photographic imagery.
- This evaluation is based on data available at this time. The estimates and opinions contained herein may need to be revised if significant additional information becomes available. Nevertheless, the opinions are well-founded and consistent with observed conditions at the site.
- S&ME used generally accepted industry practices to characterize site conditions.
- This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions of a type or at a specific location not evaluated.



- This evaluation was prepared by S&ME specifically for use by the Client and SCDHEC. Use of or reliance upon this information by any other party without express written permission granted by S&ME and the Client is not authorized and is completely at the risk of the user.

## 5.0 CONCLUSIONS

S&ME has completed a hydrogeologic assessment at the approximate 461-acre site located near Pacolet, in Spartanburg County, South Carolina. The purpose of the assessment requested by River Bend Aggregates, LLC was to provide information regarding off-site water well use within a 0.5 mile radius of the limits of the proposed aggregate quarry pits, and to characterize site hydrogeologic conditions for the development of a groundwater model, to be utilized to predict impacts due to mine dewatering.

The findings of our water well survey indicated eleven known or suspected water supply wells were identified within a 0.5-mile radius of the edge of the proposed mine pits. Four of the eleven well sites identified are located on the opposite side of the Pacolet River. Of the seven well sites identified on the same side of the river as the proposed quarry, three are located on properties that will be owned by River Bend Aggregates LLC (1010, 1050, and 1070 Hammett Grove Road). The remaining four wells identified are located east of the proposed mine pits. Goucher Water Company has a public water line that runs south along Hammett Grove Road and terminates at the driveway for 1010 Hammett Grove Road.

The proposed aggregate mining operations will use dry mining techniques; therefore, the proposed mining area will be dewatered via groundwater extraction points/sumps. S&ME understands that future mine operations will likely include reintroducing a portion of the groundwater extracted by dewatering into on-site or nearby stream segments, to lessen anticipated stream flow impacts. Based on the hydrogeology of the subject site, dewatering of the mine is predicted to have limited or no impact to water supply wells on the opposite side of the Pacolet River. Empirically, it is conceivable that deep bedrock water wells on properties to the east of the proposed aggregate quarry could experience reduced groundwater levels, as mine operations excavate rock from depths of 150 feet or more. Depending upon the total depth of these wells and the degree of fracturing they encounter, aquifer drawdown due to mine dewatering operations may or may not impact users of the water wells.

The pending groundwater modeling task will assess groundwater flow into the pit area during dewatering during mine operations and forecast potential dewatering impacts on neighboring wells, bodies of water, streams, and nearby wetlands. The predictive groundwater model, to be provided subsequently as a separate document to support the mine permit application, will be based on known or expected primary features of geology, hydrogeology, site-specific relationships between geologic structures and groundwater flow, and the proposed mine pit location configuration and estimated final depth. The groundwater modeling report will provide predictions of the mine dewatering impacts.



## 6.0 REFERENCES

Preliminary Digital Geologic Map of the Appalachian Piedmont and Blue Ridge, South Carolina Segment, U.S. Geological Survey Open-File Report 01-298

Geology of the Carolinas (1991), Horton, Jr. J. Wright, and Zulu A. Victor, University of Tennessee Press

Heath, R.C. (1989), Ground Water in the Piedmont: Proceedings of a conference on ground water in the Piedmont of the eastern United States: Clemson University, October 16-18, 1989: Clemson, South Carolina.

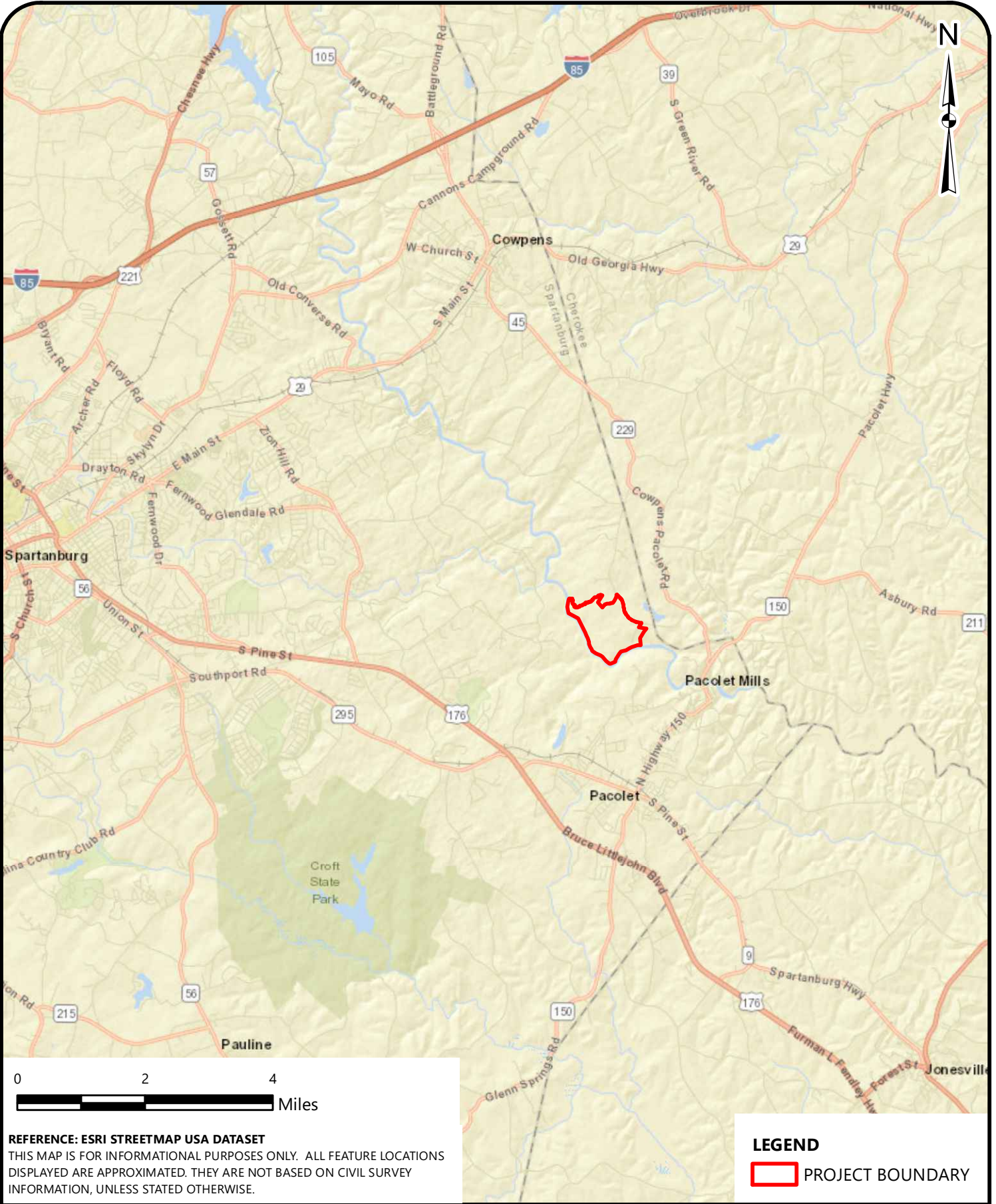
Heath, R.C. (1990), Basic Elements of Ground-Water Hydrology with Reference to Conditions in North Carolina: USGS Water-Resources Investigations Open File Report 80-44, page 86.

## **Appendices**

## **Appendix I – Figures**



Drawing Path: T:\Charlotte-1350\Projects\2022\226105048\_Synergy Materials\_Pacolet Quarry\_SCI\Civil\_Geo-Env\GIS\WORKING GIS DATA\wellgeolocation01\_vicinity.mxd plotted by DHomans 09-13-2023



**VICINITY MAP**

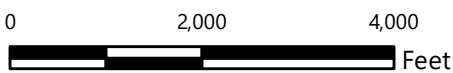
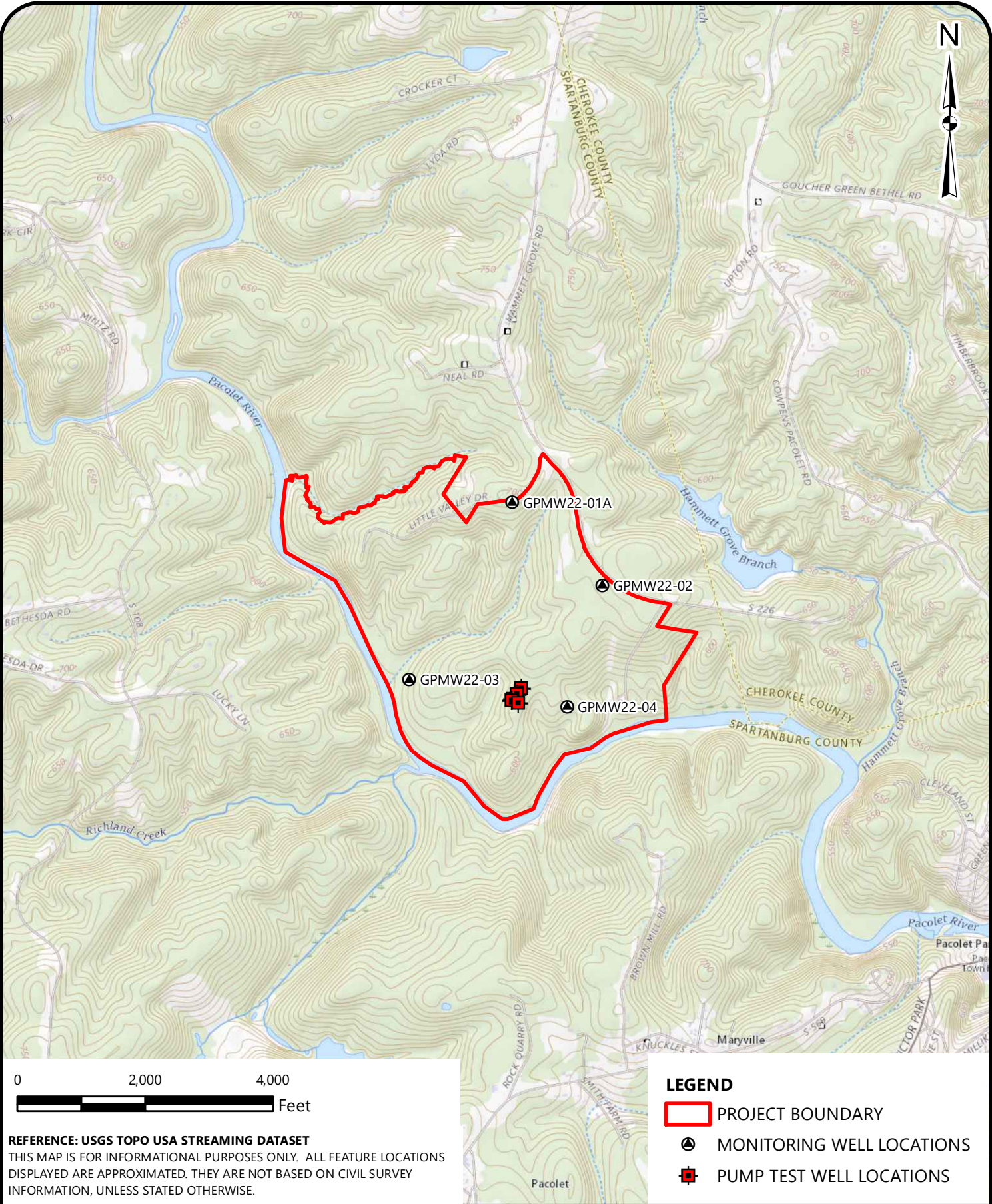
RIVER BEND QUARRY SITE  
 SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:  
 1" = 2.0 miles  
 DATE:  
 9-13-23  
 PROJECT NUMBER  
 22610504

FIGURE NO.  
**1**



Drawing Path: T:\Charlotte-1350\Projects\2021\22610504B\_Synergy Materials\_Pacolet Quarry\_SCI\Civil\_Geo-Env\GIS\WORKING GIS DATA\welllocation\02\_topo.mxd plotted by D.Homans 09-28-2023



**REFERENCE: USGS TOPO USA STREAMING DATASET**  
 THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

**LEGEND**

- PROJECT BOUNDARY
- ▲ MONITORING WELL LOCATIONS
- PUMP TEST WELL LOCATIONS



**USGS TOPOGRAPHIC MAP**

RIVER BEND QUARRY SITE  
 SPARTANBURG COUNTY, SOUTH CAROLINA

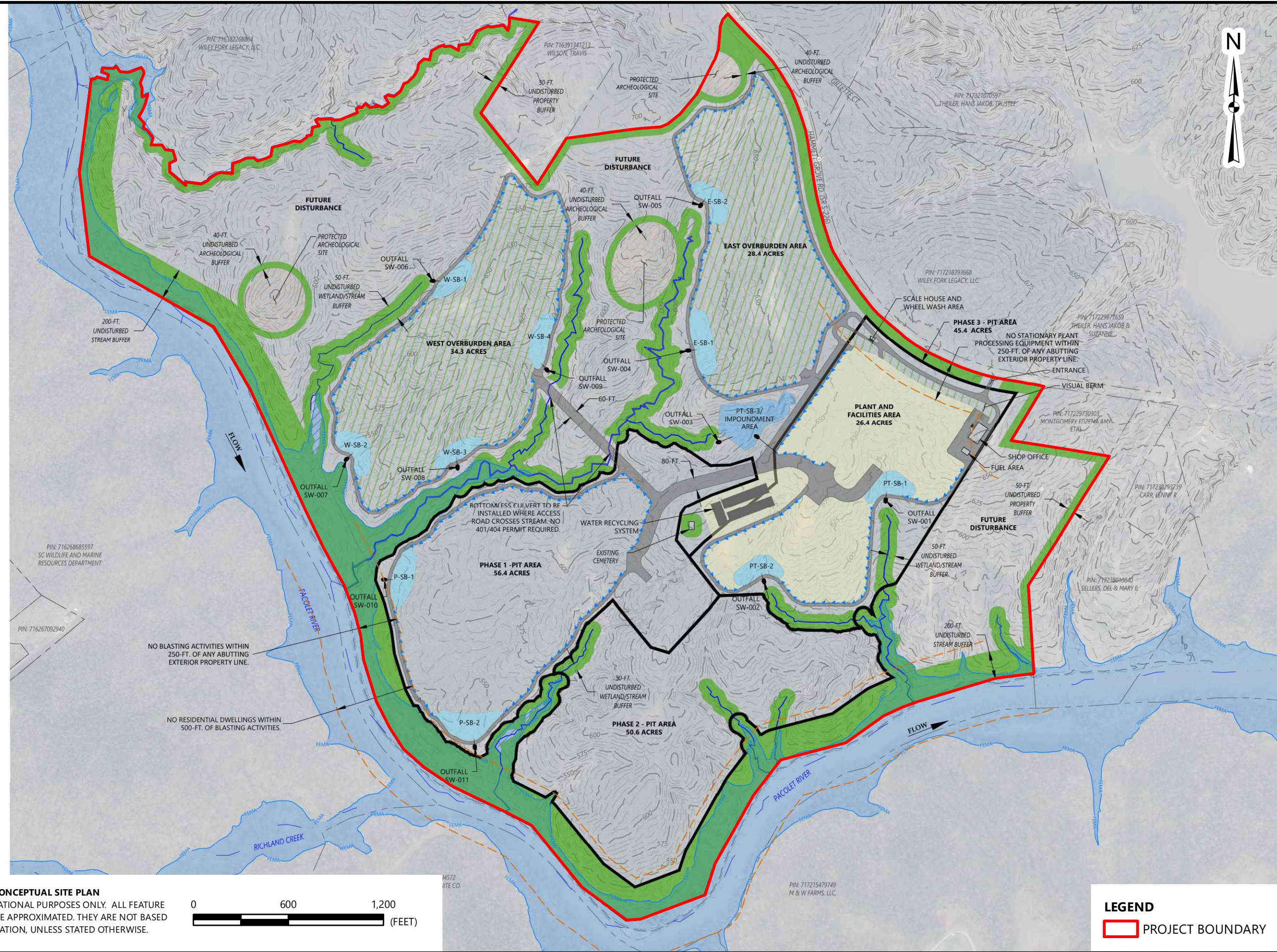
SCALE:  
 1" = 2,000'  
 DATE:  
 9-28-23  
 PROJECT NUMBER  
 22610504

FIGURE NO.

**2**



Drawing Path: T:\Charlotte-1350\Projects\2022\22610504B\_Synergy\_Materials\_Pacolet\_Quarry\_Pacolet\_Quarry\_Pacolet\_Quarry\_GIS\GIS\WORKING\_GIS\_DATA\well\geolocation\03\_siteplan.mxd plotted by DHomans 09-13-2023



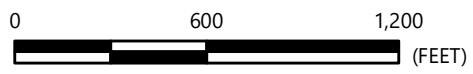
**CONCEPTUAL SITE PLAN**

RIVER BEND QUARRY SITE  
SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:  
1" = 600'  
DATE:  
9-13-23  
PROJECT NUMBER  
22610504  
FIGURE NO.

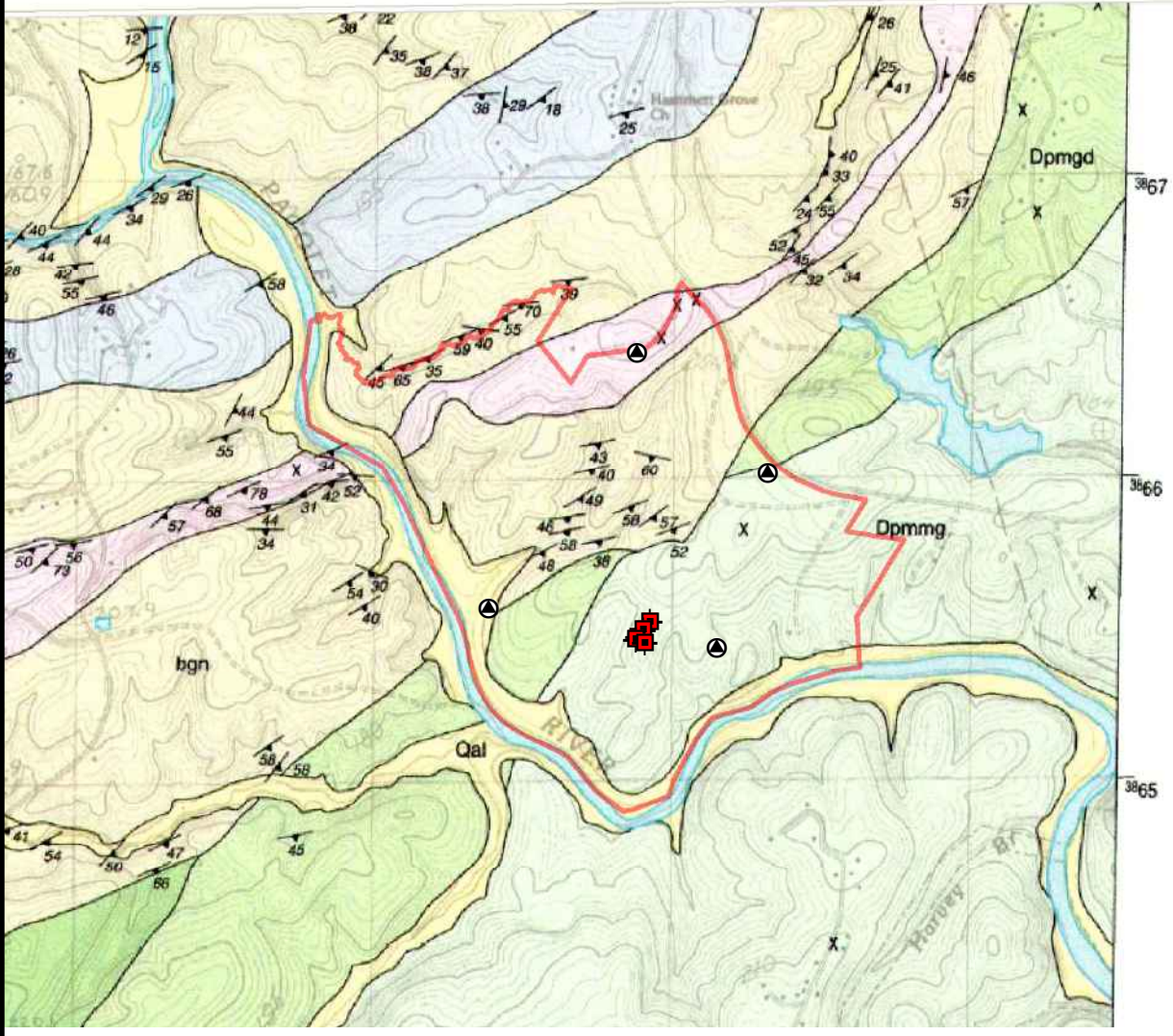
**3**

**REFERENCE: 8/30/2023 CONCEPTUAL SITE PLAN**  
THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.



**LEGEND**  
[Red outline symbol] PROJECT BOUNDARY





**LEGEND**

- PROJECT BOUNDARY
- PUMP TEST WELL LOCATIONS
- MONITORING WELL LOCATIONS



- Qal** Quaternary alluvium – Quaternary fluvial sediments in the flood plains of rivers and streams.
- PACOLET MILLS PLUTON (Devonian; 383+7 Rb-Sr whole rock age)**
- Dpmgd** Medium- to coarse-grained to porphyritic granodiorite
- Dpmmg** Fine- to medium-grained monzogranite
- INNER PIEDMONT TERRANE**
- Laurens Thrust Sheet**
- bgn** Mainly thin bedded, fine- to medium-grained biotite gneiss; lesser thick- bedded medium- to coarse-grained biotite gneiss
- gms/ms /am** Interlayered quartz mica schist, mica schist and sillimanite mica schist, and thin-bedded amphibolites
- Hammett Grove Meta-igneous Suite**
- hgs** Altered ultramafics; mostly soapstone, impure talc schist, and serpentinite
- ↘<sup>32</sup> Inclined metamorphic or tectonic foliation, showing strike and dip

**REFERENCE: PORTION OF SOUTH CAROLINA GEOLOGICAL SURVEY GEOLOGIC MAP OF THE PACOLET QUADRANGLE, SPARTANBURG AND CHEROKEE COUNTIES, SOUTH CAROLINA (2000)**

THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: T:\Charlotte-1350\Projects\2022\22610504B\_Synergy Materials\_Pacolet Quarry\_Pacolet SC\Civil-Geo-Env\GIS\WORKING GIS DATA\wellgeolocation\04\_geologymap.mxd plotted by DHomans 09-28-2023



**GEOLOGY MAP**

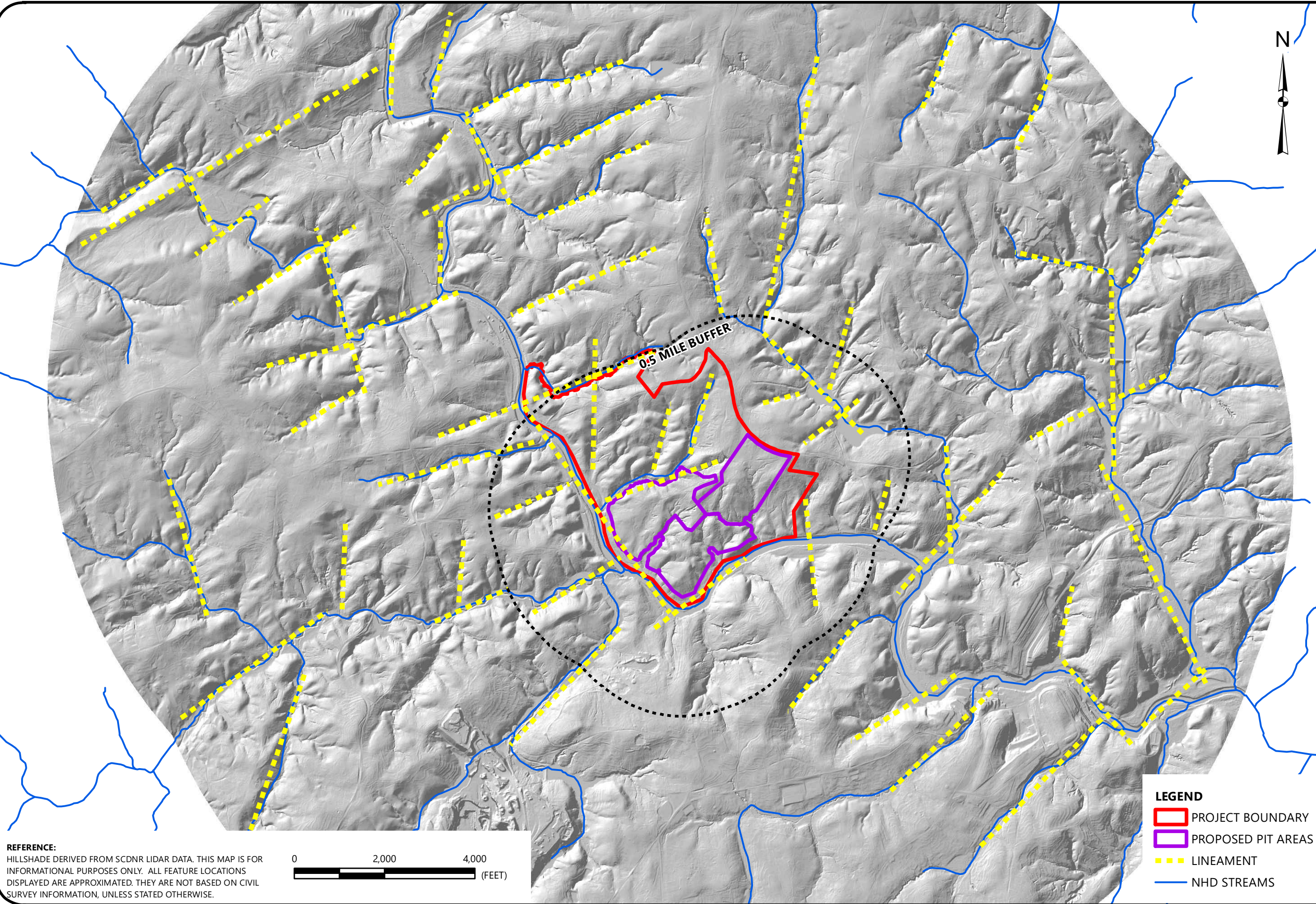
RIVER BEND QUARRY SITE  
SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE: 1" = 2,000'
DATE: 9-28-23
PROJECT NUMBER 22610504

FIGURE NO.  <b>4</b>
----------------------------



Drawing Path: T:\Charlotte-1350\Projects\2022\22610504B\_Synergy\_Materials\_Pacolet\_Quarry\_Pacolet\_Sc\Civil-Geo-Env\GIS\WORKING GIS DATA\well\geolocation\05\_lineaments.mxd plotted by DHomans 09-28-2023



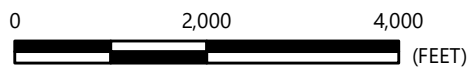
**LINEAMENT STUDY MAP**





RIVER BEND QUARRY SITE  
SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:  
1" = 2,000'  
DATE:  
9-28-23  
PROJECT NUMBER  
22610504  
FIGURE NO.

**5**

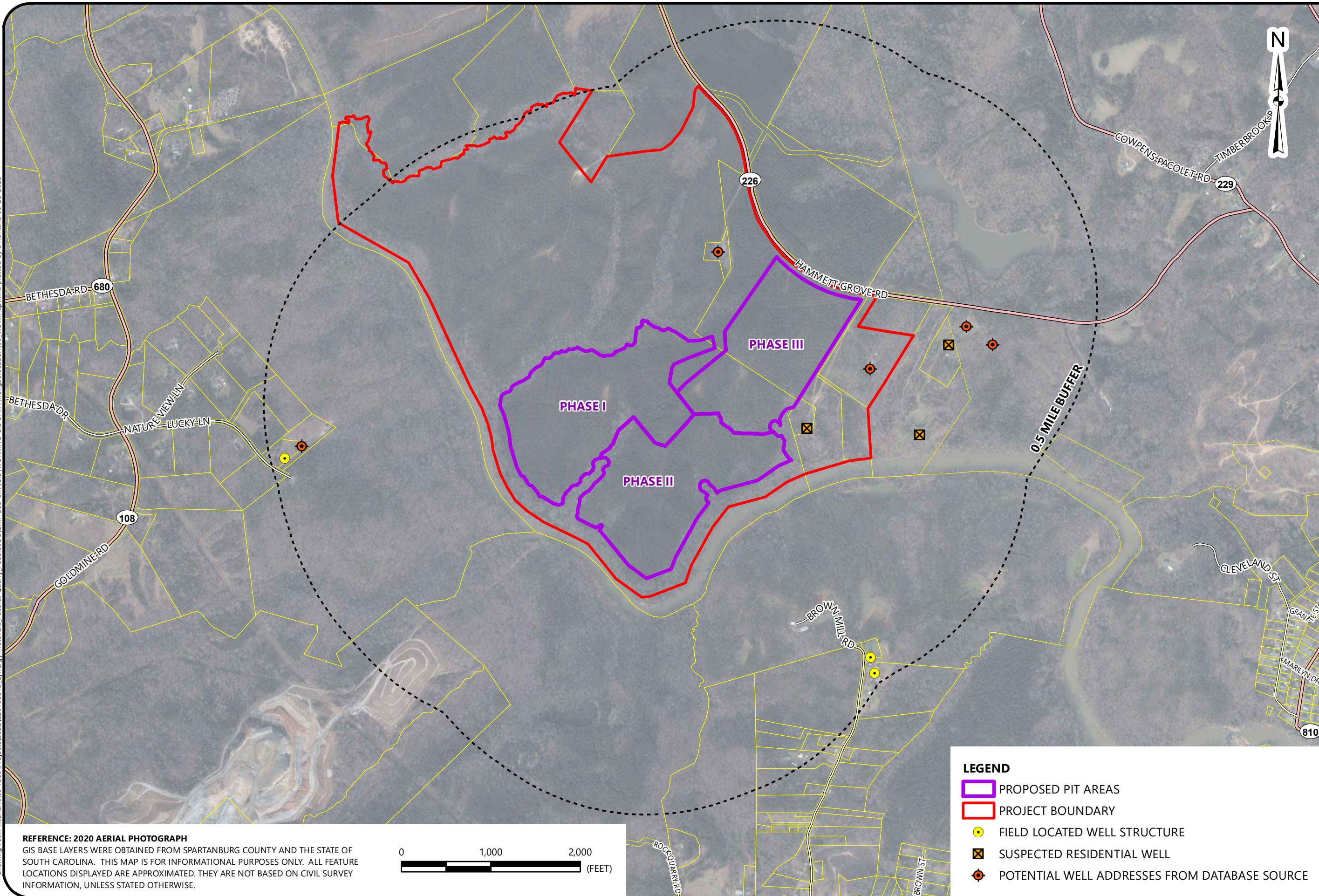
**REFERENCE:**  
HILLSHADE DERIVED FROM SCDNR LIDAR DATA. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.



- LEGEND**
-  PROJECT BOUNDARY
  -  PROPOSED PIT AREAS
  -  LINEAMENT
  -  NHD STREAMS



Drawing Path: T:\Charlotte-1350\Projects\2022\22610504B\_Synergy Materials\_Pacolet Quarry\_Pacolet Quarry\_Geo-Env\GIS\WORKING GIS DATA\well\geolocation\06\_WSWmap.mxd plotted by D.Homans 09-28-2023



**WATER SUPPLY WELL MAP**

RIVER BEND QUARRY SITE  
SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:  
1" = 1,000'

DATE:  
9-28-23

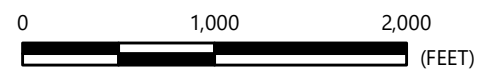
PROJECT NUMBER  
22610504

FIGURE NO.






**6**

**REFERENCE: 2020 AERIAL PHOTOGRAPH**

GIS BASE LAYERS WERE OBTAINED FROM SPARTANBURG COUNTY AND THE STATE OF SOUTH CAROLINA. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.



**LEGEND**

-  PROPOSED PIT AREAS
-  PROJECT BOUNDARY
-  FIELD LOCATED WELL STRUCTURE
-  SUSPECTED RESIDENTIAL WELL
-  POTENTIAL WELL ADDRESSES FROM DATABASE SOURCE



Drawing Path: T:\Charlotte-1350\Projects\2022\22610504B\_Synergy Materials\_Pacolet Quarry\_Pacolet SW\GIS\WORKING GIS DATA\well\location\07\_pumpstestwells.mxd plotted by DHomans 09-13-2023



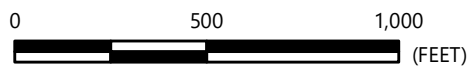
**PUMP TEST WELL LOCATIONS**

RIVER BEND QUARRY SITE  
SPARTANBURG COUNTY, SOUTH CAROLINA

SCALE:  
1" = 500'  
DATE:  
9-13-23  
PROJECT NUMBER  
22610504  
FIGURE NO.

**7**

**REFERENCE: 8/30/2023 CONCEPTUAL SITE PLAN**  
THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.



- LEGEND**
- PUMP TEST WELL LOCATIONS
  - PROJECT BOUNDARY



## **Appendix II – Receptor Survey**





**Freedom of Information Request Form**  
Customer Service: (803) 898-3882

Date: \_\_\_\_\_

Internal request number: \_\_\_\_\_

**Contact information**

Name: \_\_\_\_\_ Company/Organization: \_\_\_\_\_

Street address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone number: \_\_\_\_\_ Email address: \_\_\_\_\_

**Request information**

**I'm requesting:**

Facility or project name: \_\_\_\_\_

Facility address: \_\_\_\_\_

County: \_\_\_\_\_

DHEC file custodian/staff contact if known: \_\_\_\_\_

Description of documents or files requested:

**Family Privacy Protection Act statement**

The Family Privacy Protection Act, SC Code Section 30-2-50, prohibits any person or private entity from knowingly obtaining or using any personal information obtained from our agency for commercial solicitation directed to any person in the State. Violation of this law is a crime.

I have read and understand this statement. I am not requesting personal information for the purposes of commercial solicitation or in violation of law.

Signed: \_\_\_\_\_ 

**Submit requests: Email: [foi@dhec.sc.gov](mailto:foi@dhec.sc.gov) • Fax: (803) 898-3816 • Mail: FOI Office, 2600 Bull St., Columbia, S.C. 29201**

**Office Use Only:** Date completed: \_\_\_\_\_

**Billing info:** Research: Time: \_\_\_\_\_ Cost: \_\_\_\_\_ Redaction Time: \_\_\_\_\_ Cost: \_\_\_\_\_

Off-site/Archive Retrieval # Boxes: \_\_\_\_\_ Fee: \_\_\_\_\_

Description: \_\_\_\_\_

Services: \_\_\_\_\_

Delivery options: \_\_\_\_\_

**Total charge:** \_\_\_\_\_

## Instructions for Completing DHEC Form 2295

**Purpose:** This form is used to obtain records under of the SC Freedom of Information Act

**Who completes the form:** Any person seeking review or copies of public records of the Department.

### Instructions:

1. Fill out the top portion of the form by providing complete contact information. We may contact you to obtain additional information necessary to fulfill your request. Please provide a telephone number where you can be reached between 8:30 a.m. to 5 p.m., Monday through Friday.
2. Provide as much information about the desired documents as possible.
3. Read and sign the Family Privacy Protection Act statement.

**Submit the form:** E-mail, fax or mail completed form to staff in the FOI Office.

### Fee Schedule

Freedom of Information Center

---

1. Search Fee.....	\$20.00 per hour
2. Redaction Fee .....	\$20.00 per hour
3. Off-site/Archive Retrieval Fee.....	\$15.00 per box
4. Copies	
25 pages or less.....	Free
26 pages or more.....	\$.10 per page

### Contact Information

For additional information, contact the:  
Freedom of Information Center  
South Carolina Department of Health and Environmental Control (DHEC)  
2600 Bull Street  
Columbia, SC 29201  
(803) 898-3882

## **Appendix III – Geophysical Survey Report**

**GEOPHYSICAL INVESTIGATION**  
**Synergy Materials, LLC Proposed Quarry Site**  
Pacolet, South Carolina

*Prepared for:*  
S&ME, Inc.  
8646 W. Market Street, Suite 105  
Greensboro, NC 27409

January 24, 2023

*Prepared by:*  
THG Geophysics, Ltd.  
4280 Old William Penn Highway  
Murrysville, Pennsylvania 15668  
724-325-3996  
[www.thggeophysics.com](http://www.thggeophysics.com)  
THG Project No. 459-11297

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## FIGURES

1. VLF Location Map
2. Geophysical Survey Map
3. VLF Profiles

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The project site, located in Pacolet, South Carolina is undergoing preparations for development of a proposed rock quarry (**Figure 1**). As part of the site geotechnical investigation, S&ME, Inc. contracted with THG Geophysics, Ltd. to perform a series of geophysical surveys to investigate the subsurface of the site. The objective of this investigation was to image the subsurface of the site for potential bedrock fractures.

### 1.2 WORK SCOPE

THG collected five (5) very low frequency (VLF) electromagnetic survey at the proposed site (**Figure 2**). VLF was chosen as the best method to image the site based on its exceptional ability to locate bedrock fractures and its efficient data collection and high resolution. Geophysical data were collected January 4-5, 2023.

## 2.0 GEOPHYSICAL INVESTIGATION

### 2.0 Very Low Frequency Electromagnetics

The VLF method can be used to find steeply dipping structures that differ from their surroundings with regard to electrical conductivity. VLF transmitters send out low frequency military radio signals (15-30 kHz). When the low frequency field emitted by one of the transmitters strikes an anomaly, secondary currents are created that can be read and recorded by the WADI VLF instrument. The VLF transmitter located in Cutler, Maine, was used for this survey and maintained acceptable average signal strength of 20.

When a field emitted by a transmitter strikes a body having low electrical resistance, secondary circuits are created in the body. Fraser filtering, a numeric algorithm is performed on the real part of the VLF data to enhance the anomaly indication. Fraser filtering is based upon the work of Karous and Hjelt (1983):

$$F_0 = -0.102 H_{-3} + 0.059 H_{-2} - 0.561 H_{-1} + H_0 + 0.561 H_1 - 0.059 H_2 + 0.102 H_3$$

Where;  $F_0$  is the filtered result and  $H_{-3}$  to  $H_3$  are the original VLF data.

Eight VLF profiles were collected using an ABEM WADI VLF meter (**Figure 2**). Data were processed using Ramag VLF modeling software and locational data was collected using a Trimble GEO-7XH GPS.

### 2.2 QUALITY ASSURANCE AND CONTROL

The interpretation of geophysical data is not an exact science since responses to induced disturbance are affected by many phenomena including buried metals, operator error, precipitation, and net changes in ground saturation conditions. Some sources of spurious data can be overcome through a QA/QC program and use of multiple geophysical methods. The quality control program employed with this study included frequent checks of the equipment and daily calibrations. The QA/QC program indicates that all geophysical equipment functioned as designed during the survey.

### **3.0 GEOLOGY**

The site is regionally located in the Western Piedmont region of South Carolina. The bedrock consists of the Devonian-aged monzogranite (Horton and Dicken, 2001). The site is located within the Pacolet Mills Pluton, which is adjacent to the Kings Mountain shear zone at the southeastern edge of the Inner Piedmont Block (Horton and Butler, 1981). The monzogranite is predominantly a porphyritic biotite monzogranite with minor muscovite. The monzogranite grades into a granodiorite and tonalite near the border of the pluton (Horton and McConnell, 1991).



## 4.0 GEOPHYSICAL ANALYSES

### 4.1 INTRODUCTION

Five (5) VLF profiles were collected across the site in an orthogonal orientation (northeast to southwest and northwest to southeast). In order to efficiently survey the entire approximately 33-acre site, parallel VLF profiles were spaced approximately 500 to 00 feet from one another (**Figure 2**). The VLF profiles imaged to a depth of 300 feet below grade; however, this does not take into account topography.

VLF Profiles 1 and 2 were acquired in approximately northwest to southeast orientation and VLF Profiles 3 to 5 were acquired in an approximately northeast to southwest orientation (**Figure 2**). All profiles were collected using a 32-foot (10-meter) station separation.

In addition to fractures, anomalies can be generated by cultural sources. For example, power lines, subsurface utilities and metal fencing can also cause very strong anomalies. None of these features were in the field and thus the VLF data quality is very good.

### 4.2 DISCUSSION

Based on the results of this geophysical investigation, four (4) proposed well locations, B-1, B-2, B-3, and B-4, have been identified. All proposed borings are based upon VLF anomalies (**Figure 2**).

Four (4) predominant fractures, oriented N45°E, have been identified in the study area (**Figure 2**). Fractures were positioned on the map based on where they would theoretically intercept the ground surface. All interpreted fractures are located within the pit of the proposed quarry (**Figures 2 and 3**).

Locally a graben fracture system was located on VLF Profiles 1 and 2. Two borings are proposed to test this feature, B-1 and B-2. Because of the presence of an antithetic fracture to the main fracture, these graben features are generally excellent for groundwater production. Borings B-3 and B-4 test fractures that appear to be well-developed.

## 5.0 CONCLUSION

VLF methods were used to identify subsurface fractures at the proposed quarry in Pacolet, South Carolina. The interpreted fractures at the Pacolet site trend N45°E (**Figure 2**). Fracture dips were interpreted in both directions perpendicular, respectively, to the trend of a fracture a dip approximately 45°.

Four (4) proposed drilling locations were identified across the site; two (2) will test a graben fracture system and two (2) additional drilling locations are based on well-developed fractures shown in VLF profiles.

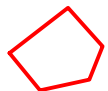
*Geophysical investigations are a non-invasive method of interpreting physical properties of the shallow earth using electrical, electromagnetic, or mechanical energy. This document contains geophysical interpretations of responses to induced or real-world phenomena. As such, the measured phenomenon may be impacted by variables not readily identified in the field that can result in a false-positive and/or false-negative interpretation. THG makes no representations or warranties as to the accuracy of the interpretations.*

## 6.0 REFERENCES

- Horton, J.W., Jr., and Butler, J.R. (1981). Geology and mining history of the Kings Mountain belt in the Carolinas; a summary and status report, in Horton, J.W., Jr., Butler, J.R., and Milton, D.J., eds., Geological investigations of the Kings Mountain belt and adjacent areas in the Carolinas: Columbia, South Carolina Geological Survey, Carolina Geological Society Field Trip Guidebook 1981, p. 194–212
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- Karous and Hjelt (1983). Linear filtering of VLF dip-angle measurements: Geophysical Prospecting, v. 31, p. 782-794.



**Legend**



Property Boundary



Site Area



Proposed VLF Profile



4280 Old William Penn Hwy  
Murrysville, Pennsylvania 15668  
(724) 325-3996 Fax: (724) 733-7901  
www.thggeophysics.com

DRN	PJH	1/23/2023
DES	PJH	1/23/2023
CHK	PJH	1/23/2023
REV		
PROJ. MGR.	MLT	1/23/2023

PROJECT:

**Geophysical Investigation  
Synergy Materials, LLC  
Pacolet, South Carolina**

SCALE: Not to Scale

DRAWING NO.:

**Figure 1  
VLF Location Map**

SOURCE: Google Earth, 2022

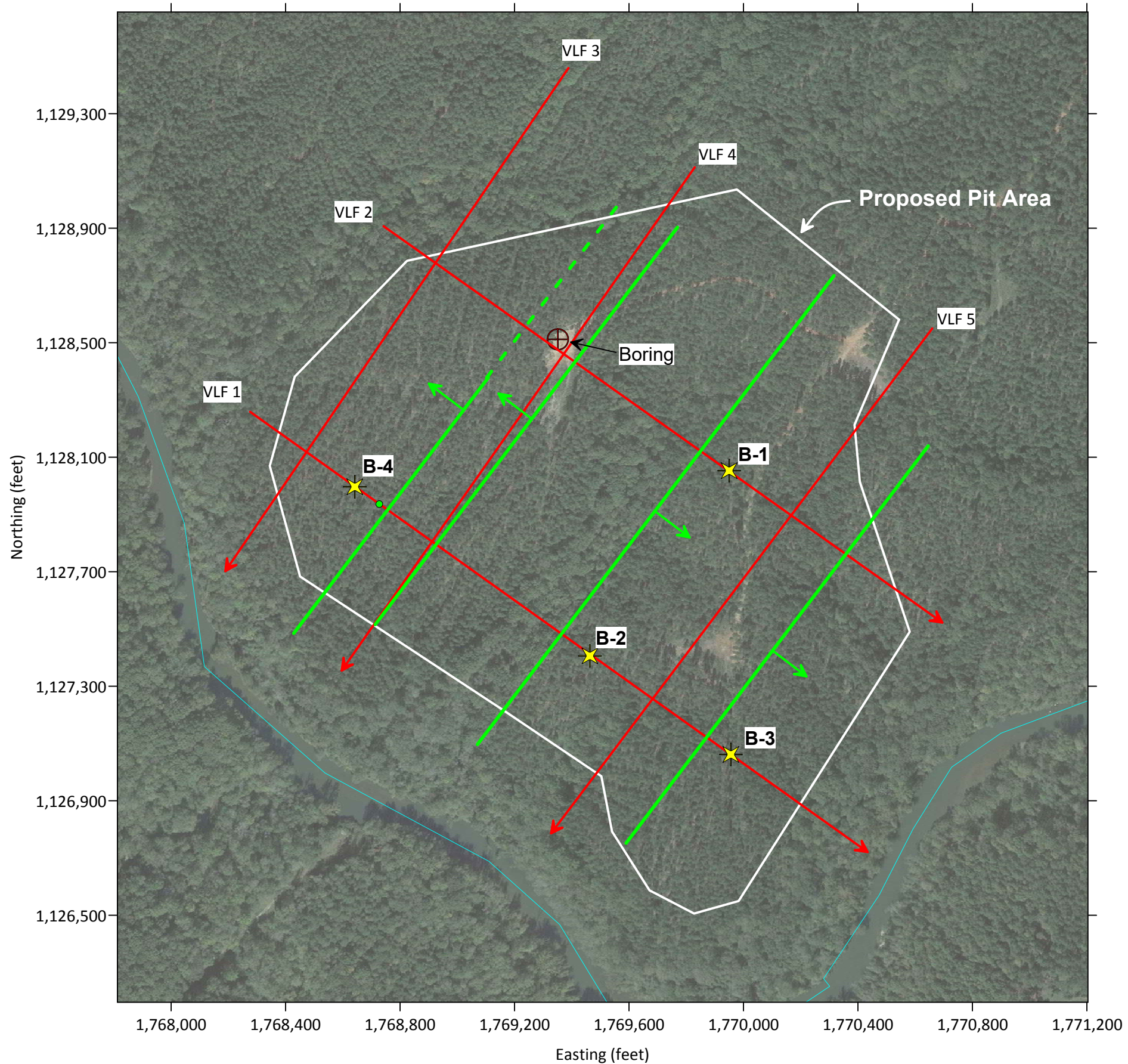
PREPARED FOR:



PROJECT NO:  
459-11297

SHEET TITLE:  
DWG11297F1





**Proposed Drill Loc.**

Order	X-Axis	Y-Axis
1.	1,769,946	1,128,050
2.	1,769,461	1,127,409
3.	1,769,955	1,127,059
4.	1,768,642	1,127,997

**Legend**

	VLF Profile (showing collection direction)
	Site Limits

**Notes**

Geophysical survey was conducted January 4-5, 2023 using an ABEM Wadi VLF meter.

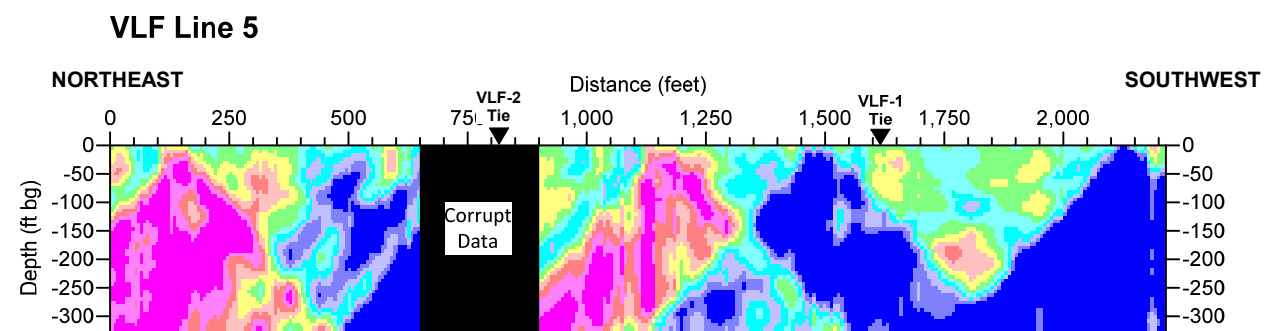
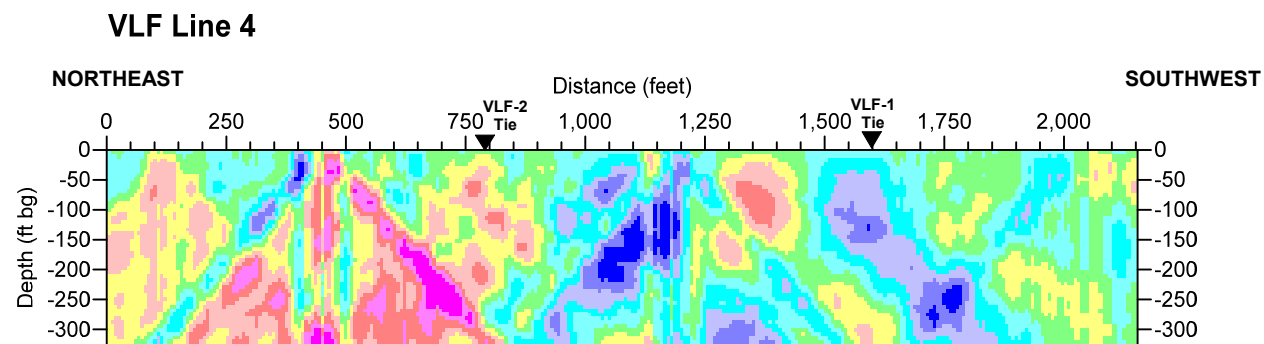
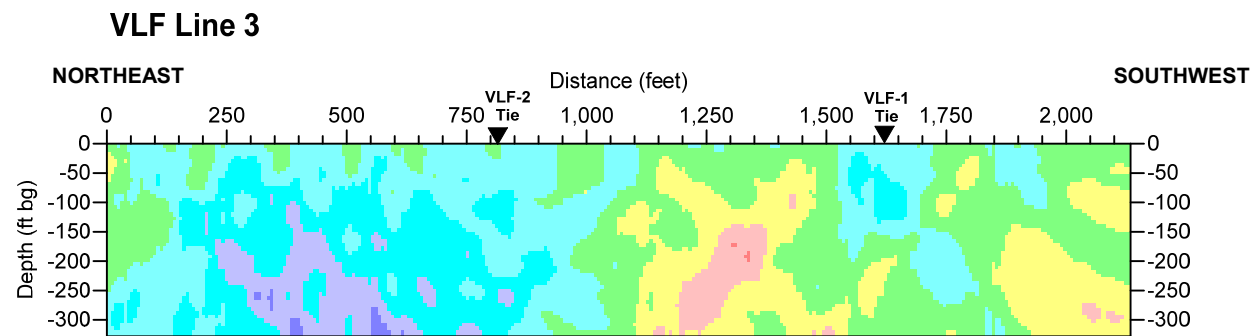
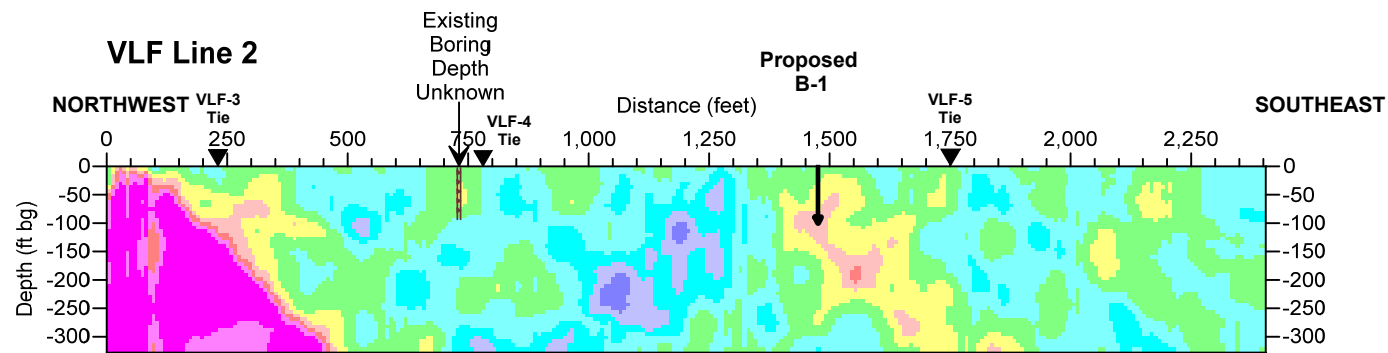
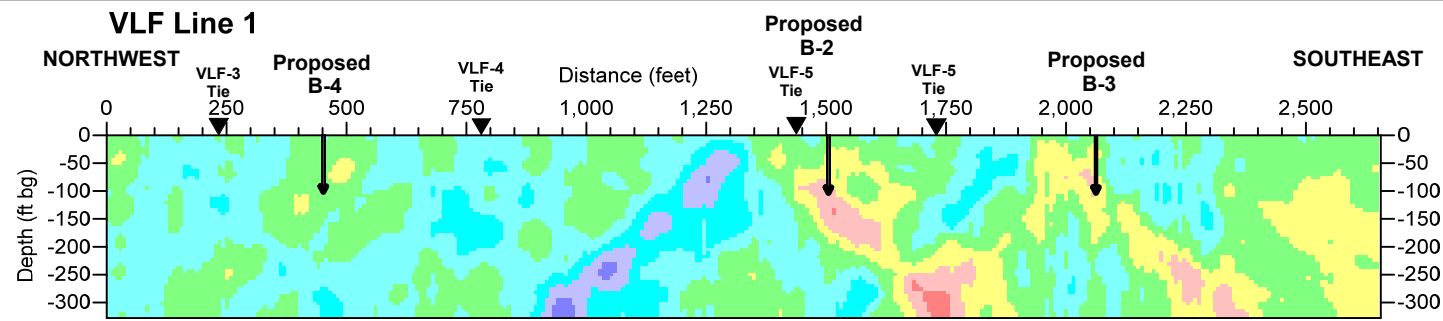
Real-time positioning of data using fully integrated Trimble Geo-7X global positioning system set to NAD 1983 US State Plane (South Carolina) coordinate system in US Survey feet.

Locations and depths are approximate.

**THG GEOPHYSICS**  
 4280 Old William Penn Hwy  
 Murrysville, Pennsylvania 15668  
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 www.thggeophysics.com

DRN	MLT	1/20/23	<b>PROJECT:</b> <b>Geophysical Investigation</b> <b>Synergy Materials, LLC</b> <b>Pacolet, South Carolina</b>
DES	MLT	1/20/23	
CHK	PJH	1/20/23	
REV			
PROJ. MGR.	MLT	1/20/23	
SCALE: 1 in = 500 ft			<b>DRAWING NO.:</b> <b>Figure 2</b> <b>Geophysical Survey Map</b>
SOURCE: Google Earth, 2023			
PREPARED FOR:			<b>PROJECT NO.:</b> 459-11297 <b>SHEET TITLE:</b> DWG11297F2





**Notes**

Geophysical survey was conducted January 4-5, 2023 using an ABEM Wadi VLF meter.

Real-time positioning of data using fully integrated Trimble Geo-7X global positioning system set to NAD 1983 US State Plane (South Carolina) coordinate system in US Survey feet.

Locations and depths are approximate.

Scale:  
 Vertical: 1 inch = 328 feet (100 meters)  
 Horizontal: 1 inch = 400 feet

**THG GEOPHYSICS** 4280 Old William Penn Hwy  
 Murrysville, Pennsylvania 15668  
 (724) 325-3996 Fax: (724) 733-7901  
 www.thggeophysics.com

DRN	MLT	1/20/23	<b>PROJECT:</b> <b>Geophysical Investigation Synergy Materials, LLC</b> <b>Pacolet, South Carolina</b>
DES	MLT	1/20/23	
CHK	PJH	1/20/23	
REV			
PROJ. MGR.	MLT	1/20/23	
SCALE: See Notes			<b>DRAWING NO.:</b> <b>Figure 3</b> <b>VLF Profiles</b>
SOURCE: Google Earth, 2023			
PREPARED FOR:			<b>PROJECT NO.:</b> 459-11217 <b>SHEET TITLE:</b> DWG11217F3

## **Appendix IV – Well Permit, Boring Logs and Well Records**



# Monitoring Well Application

1. Proposed Location of Monitoring Well(s):

Street Address: **1010 Hammett Grove Road**

City (including Zip): **Spartanburg, SC 29307**

County: **Spartanburg**

Please attach Scaled Map or Plat

5. Intended Purpose of Well(s):

Pre-Purchase

Investigation

**NOTE:** If this request is for an existing DHEC project, please enter the Program area and ID number below.

Program Area: **MW-13489**  
Project or Site ID #:

6. Proposed number of monitoring wells: **4 Perm. plus 5 Hyd Study**

2. Well Owner's Information:

Name (Last then First): **Mitchell, Jack**

Company: **Synergy Materials, LLC**

Complete Address: **1831 12th Ave S. #400  
Nashville, TN 37203**

Telephone Number: **(615) 216-4832**

7. Proposed parameters to be analyzed (check all that apply), please specify analytical method beside check box:

VOCs

BTEX

MtBE

Naphthalene

PAHs

Metals  EPA Method 6010

Nitrates  EPA Method 353.2

Base, Neutral & Acid Ex.

Pesticides/Herbicides

Phenols

Radionuclides

PCBs

Other (specify below)

3. Property Owner's Information:

Check if same as Well Owner

Name (Last then First): **Wesson, Mark**

Company: **Wiley Fork Legacy**

Address: **100 Dunbar St, 400  
Spartanburg, SC 23906**

Telephone Number: **(864) 585-2000**

8. Proposed construction details (complete and attach proposed monitoring well schematics):

**See attached typical diagram**

4. Proposed Drilling Date: **12/08/2022**

**Revised to Start 2/13/2023**



## **South Carolina Department of Health and Environmental Control (SCDHEC) summary of standards for monitoring well construction (per South Carolina Well Standards and Regulations R. 61-71)**

### **Approval and License Requirements**

Prior Department approval is required for the installation or abandonment of all monitoring wells including direct push, geoprobe or other temporary type monitoring wells. The attached monitoring well approval document should be completed, submitted and approved prior to construction of any monitoring well. A monitoring well is any well used to obtain water samples for water quality analyses or to measure groundwater levels. There are no fees for approvals. All monitoring wells must be drilled by a driller that is registered in South Carolina with the Board of Certification of the Environmental Systems Operators. If any of the information on the application including the proposed drilling date, well construction details or well placement changes, the Department (i.e. project manager issuing the well approval) must be notified 24 hours prior to well construction.

### **Location**

Due to the nature and purpose of a monitoring well, the depth and location requirements in respect to surface water bodies, potential contamination sources, etc., are variable, and shall be approved on a case by case basis by the Department.

### **Construction and Material**

Casing should be of sufficient strength to withstand normal forces encountered during and after well installation and be composed of material so as to minimally affect water quality analyses. Casing should have a sufficient diameter to allow for efficient sample collection (i.e., to provide access for sampling equipment). The diameter of the drilled hole needs to be large enough on all sides (1.5 inches of annular space) to allow forced injection of grout through a tremie pipe. All monitoring wells should have a cement pad or aggregate reinforced concrete at the ground surface which extends at least six inches beyond the bore hole diameter and six inches below ground surface to prevent infiltration between the surface casing and the bore hole. All monitoring wells should be grouted from the top of the bentonite seal to the surface with a neat cement, high solids bentonite or neat cement, bentonite mixture approved by the Department. A hydrated bentonite seal with a minimum thickness of 12 inches is to be placed above the filter pack to prevent infiltration of grout if the well has a filter pack. The monitoring well intake or screen design should minimize the amount of formational materials entering the well. The gravel pack should be utilized opposite the well screen as appropriate so that parameters analyses will be minimally affected. All monitoring wells should have a locking cap or other security device to prevent damage and/or vandalism. Any monitoring well which is destroyed, rendered unusable or is abandoned should be reported to the Department and be properly abandoned, revitalized or replaced as appropriate or required by permit or regulation.

### **Development**

Monitoring wells shall be properly developed. Development shall include the removal of formation cuttings and drilling fluids from the well bore hole. Development shall be complete when the well produces water typical of the aquifer being monitored.

## **Reporting Requirements**

A monitor well record form (1903) or equivalent to include the following should be completed and submitted to the Department within 30 days after completion of the monitoring wells:

Name and address of facility/owner;  
Surveyed or global positioning system location of monitor well(s) on a scaled map or plat;  
Driller and certification number;  
Date drilled;  
Driller's or Geologist's log;  
Total depth;  
Screened interval;  
Diameter and construction details;  
Depth to water table with date and time measured;  
Surveyed elevation of measuring point with respect to established benchmark;  
Monitoring well approval number issued by the Department.

Additionally, the groundwater and soil (if taken) analytical results should be submitted to the Department within 30 days of receipt from the laboratory.

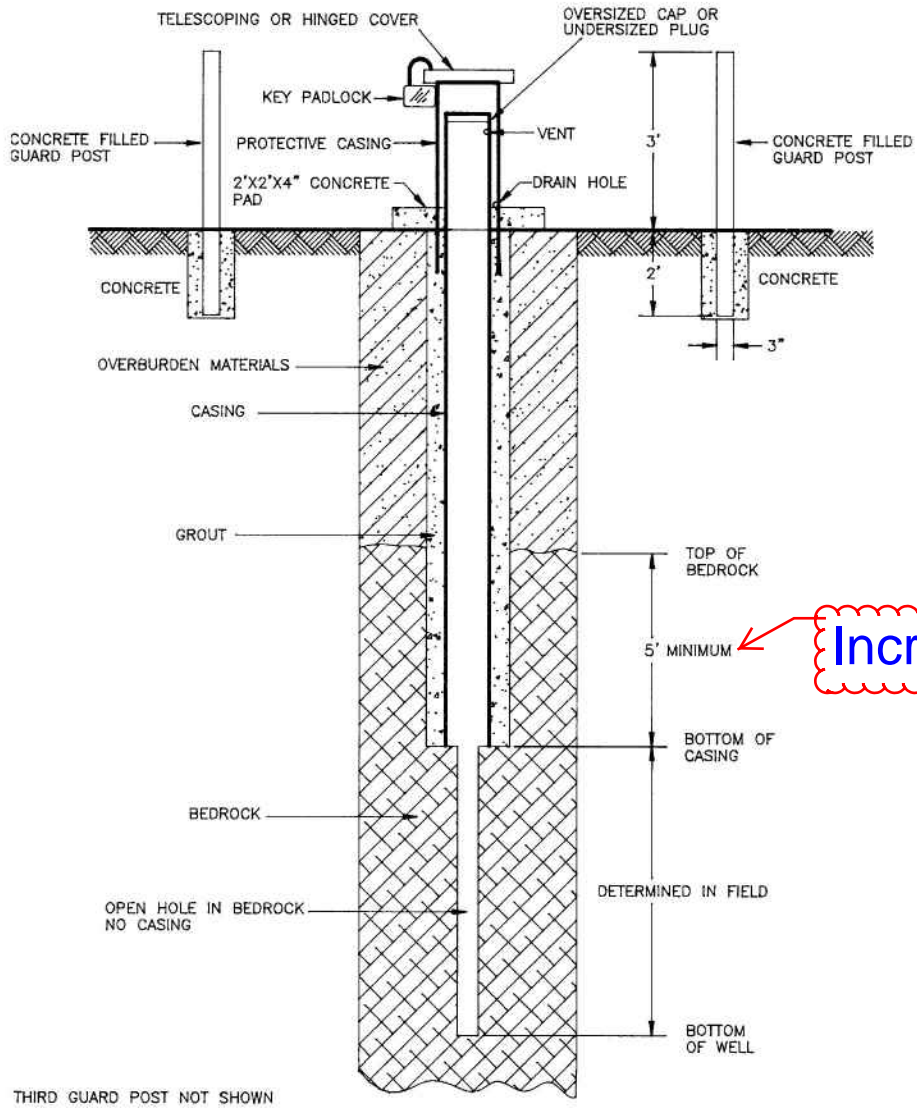
## **Abandonment**

All monitoring wells shall be properly abandoned, when deemed appropriate by the Department. Any well that acts as a source of contamination shall be repaired or permanently abandoned immediately after receipt of notice from the Department. Abandonment shall be by forced injection of grout or pouring through a tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation. The well shall be filled with either neat cement, bentonite-cement, or 20% high solids sodium bentonite grout, from the bottom of the well to the land surface.

- \* This summary of standards for monitoring well construction may not include a listing of all information necessary to obtain an approval to install monitoring wells. Final approval of monitoring well installation will be dependant upon the regulatory requirements for the Department program area for which the monitoring wells are to be installed.
  
- \* Some areas of the Department may require a detailed justification of the placement of monitoring wells and the depth of monitoring well screened zones prior to granting installation approval.

# MONITOR WELL INSTALLATION

## Typical Bedrock Well Construction





## Temporary Piezometer Approval

Approval is hereby granted to: Larry Birkner/Turn-Key  
on behalf of: Jack Mitchell/Synergy Materials, LLC  
Facility: 1010 Hammett Grove Rd  
Site Identification: MW-13553  
County: Spartanburg

This approval is for the installation of 5 temporary piezometers. The temporary piezometers are to be installed in the locations as illustrated on the submitted map and per the proposed construction details provided by your correspondence 2/2/23. The piezometers are to be installed following all of the applicable requirements of R.61-71.

**Please note that R.61-71 requires the following:**

1. All piezometers shall be drilled, constructed, and abandoned by a South Carolina certified well driller per R.61-71.D.1.
2. A Water Well Record Form or other form provided or approved by the Department shall be completed and submitted to the Department within 30 days after piezometer completion or abandonment unless the Department has approved another schedule. The form should contain the "as-built" construction details and all other information required by R.61-71.H.1.f
3. All analytical data and water levels obtained from each piezometer shall be submitted to the Department within 30 days of receipt of laboratory results unless another schedule has been approved by the Department as required by R.61-71.H.1.d.
4. All temporary piezometers shall be abandoned within 5 days of borehole completion using appropriate methods as required by R.61-71.H.4.c.
5. If any of the information provided to the Department changes, Karen Morrison (803-898-0792, [morrisks@dhec.sc.gov](mailto:morrisks@dhec.sc.gov)) shall be notified a minimum of twenty-four hours prior to piezometer construction as required by R.61-71.H.1.a.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and R.61-71 of the South Carolina Well Standards and Regulations, dated April 26, 2002.

**Date of Issuance: 2/6/23**

**Approval #: 13553**

A handwritten signature in black ink, appearing to read "R. Cole", is written over a light blue circular stamp.

Robert Cole, Manager  
Division of Site Assessment Remediation & Revitalization (SARR)  
Federal & State Site Assessment Section  
Bureau of Land & Waste Management



2/6/23

Mark Wesson  
Wiley Fork Legacy  
100 Dunbar St, 400  
Spartanburg, SC 23906

Re: Piezometer Approval Request received 2/2/23  
Spartanburg County Site ID: MW-13553

Dear Mr Wesson :

The South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed and approved the referenced temporary Piezometer approval request submitted 2/2/23. The original temporary piezometer approval has been sent to Larry Birkner/Turn-Key, Inc. and a copy is enclosed for your records. The analytical results from the groundwater samples should be submitted to my attention on or before 4/6/23. Please note the following:

- Piezometer construction and sampling derived waste including but not limited to drill cuttings, drilling fluids, and development/purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regards to contents, source, and date of activity.
- Piezometers are to yield groundwater samples representative of the zone monitored per R.61-71 H.1.c of the South Carolina Well Standards and Regulations (e.g. low flow sampling techniques are recommended for samples to be analyzed for metals to reduce induced turbidity).
- If this investigation is conducted as part of a potential real estate transaction, the potential purchaser may want to contact SCDHEC's Brownfields Program before this work is performed. The Brownfields Program offers a mechanism to avoid liability for contamination that may be found during this investigation. The investigation proposed may satisfy part or all of the required assessment if pre-approved by the Brownfields Program. The Brownfields Program may be reached at 1-866-576-3432.

If you have any questions, please contact me at (803) 898-0802.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Cole", is written over a faint, illegible typed name.

Robert Cole, Manager  
Division of Site Assessment, Remediation & Revitalization (SARR)  
Federal & State Site Assessment Section

enc: Piezometer approval

cc: SCDHEC EQC Region



# Proposed locations of wells

## Monitoring Wells for Pacolet Site

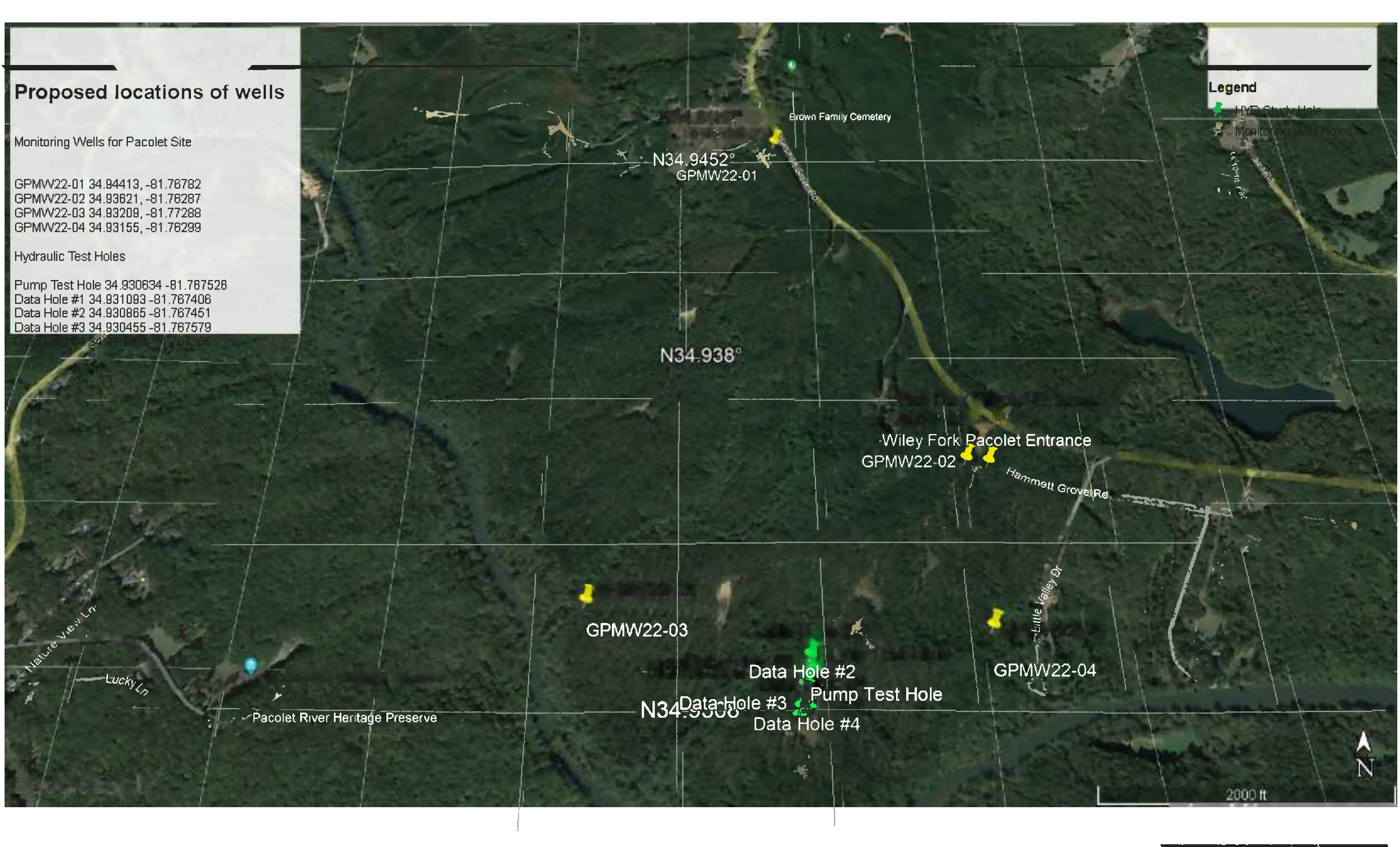
- GPMW22-01 34.94413, -81.76782
- GPMW22-02 34.93621, -81.76287
- GPMW22-03 34.93209, -81.77288
- GPMW22-04 34.93155, -81.76299

## Hydraulic Test Holes

- Pump Test Hole 34.930634 -81.767526
- Data Hole #1 34.931093 -81.767406
- Data Hole #2 34.930865 -81.767451
- Data Hole #3 34.930455 -81.767579

## Legend

- HYD Study Hole
- Monitoring Well Holes



N34.9452°  
GPMW22-01

N34.938°

Wiley Fork Pacolet Entrance  
GPMW22-02

GPMW22-03

GPMW22-04

N34.9308°

Data Hole #2  
Data Hole #3  
Pump Test Hole  
Data Hole #4

2000 ft



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1</b> <i>Sheet 1 of 5</i>	
<b>DATE:</b> 02/20/2023	<b>ELEVATION:</b> 602.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 402.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931276	<b>LONGITUDE:</b> -81.767437
<b>SAMPLING METHOD:</b>	<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>		

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
0					SILTY SAND (SM), tan, fine to medium grained, dry			598
5								593
10								588
15								583
20								578
25								573
30								568
35		35.0			SILTY SAND (SM), tan, medium to coarse grained, dry			563
40								558
45								553
50								548
55								543
59.0					METAGRANITE, light gray white, dry, Felsic, Rock			538
60								533
65								528
70								523
75								518
80								513
85								508
90		90.0			AMPHIBOLE GNEISS, soft, Tan brown green, Intermediate, Rock <i>Fracture: 92 ft to 102 ft, ~2 GPM</i>			
95								
100								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	55.8	Top of casing elevation 603.79 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1</b> <i>Sheet 2 of 5</i>	
<b>DATE:</b> 02/20/2023	<b>ELEVATION:</b> 602.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 402.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931276	<b>LONGITUDE:</b> -81.767437
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
105					AMPHIBOLE GNEISS, soft, Tan brown green, Intermediate, Rock			498
110								493
115								488
120	120.0				AMPHIBOLE GNEISS, black dark gray, soft to hard, Mafic, Rock			483
125								478
130								473
135								468
140								463
145								458
150								453
155								448
160					<i>Fracture: 160 ft, ~4 GPM</i>			443
165								438
170								433
175								428
180								423
185								418
190								413
195	195.0							408
200	200.0				METADIORITE, gray, Intermediate, Rock			403

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	55.8	Top of casing elevation 603.79 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
**LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1</b> <i>Sheet 3 of 5</i>	
<b>DATE:</b> 02/20/2023	<b>ELEVATION:</b> 602.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 402.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931276	<b>LONGITUDE:</b> -81.767437
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
205			Rock		AMPHIBOLE GNEISS, black/gray, Mafic/Intermediate, Rock <i>Bucket Test: 3-5 GPM</i>			398
210								393
215								388
220								383
225								378
230						<i>Bucket Test: ~5 GPM</i>		373
235								368
240								363
245								358
250						<i>Fracture: 250 ft, ~6 GPM</i>		353
255							348	
260							343	
265							338	
270							333	
275							328	
280					<i>Bucket Test: ~7 GPM</i>		323	
285							318	
290					<i>Fracture: 290 ft, &lt;7 GPM</i>		313	
295	295.0						308	
300					METAGRANITE, white gray green, Felsic/Intermediate, Rock			

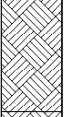
GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	55.8	Top of casing elevation 603.79 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1</b> <i>Sheet 4 of 5</i>	
<b>DATE:</b> 02/20/2023	<b>ELEVATION:</b> 602.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 402.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931276	<b>LONGITUDE:</b> -81.767437
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
305	310.0	Rock			METAGRANITE, white gray green, Felsic/Intermediate, Rock			298
310					<i>Fracture: 307 ft, &lt;7 GPM</i>			293
315					AMPHIBOLE GNEISS, black gray green, Mafic, Rock			288
320								283
325							278	
330							273	
335					<i>Fracture: 332 ft, &lt;7 GPM</i>		268	
340					<i>Bucket Test: ~7 GPM</i>		263	
345							258	
350							253	
355							248	
360							243	
365							238	
370							233	
375					<i>Fracture: 370 ft, ~8 GPM</i>		228	
380							223	
385	385.0						218	
390	390.0				METADIORITE, gray white, Intermediate/Felsic, Rock		213	
395					AMPHIBOLE GNEISS, black gray, Mafic/Intermediate, Rock		208	
400								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	55.8	Top of casing elevation 603.79 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



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DATE: 02/20/2023	ELEVATION: 602.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.
EQUIPMENT: Schramm T450	DATUM: NAVD88	
OPERATOR: IET	DEPTH: 402.0 ft	
HAMMER TYPE:	CLOSURE:	
DRILLING METHOD:	LOGGED BY: Cody McMechen	
SAMPLING METHOD:		LATITUDE: 34.931276 LONGITUDE: -81.767437
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet		

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
402.0		Rock			AMPHIBOLE GNEISS, black gray, Mafic/Intermediate, Rock <i>Bucket Test: ~8 GPM</i> Bore Hole terminated at 402.0 feet			198
405								193
410								188
415								183
420								178
425								173
430								168
435								163
440								158
445								153
450								148
455								143
460								138
465								133
470								128
475								123
480								118
485								113
490								108
495								
500								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	Σ			
END OF DRILLING	▼			
AFTER DRILLING	▼	03/22/2023	55.8	Top of casing elevation 603.79 ft
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)

DATE: 02/21/2023	ELEVATION: 604.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.
EQUIPMENT: Schramm T450	DATUM: NAVD88	
OPERATOR: IET	DEPTH: 403.0 ft	
HAMMER TYPE:	CLOSURE:	
DRILLING METHOD:	LOGGED BY: Cody McMechen	
SAMPLING METHOD:		LATITUDE: 34.931479 LONGITUDE: -81.767249
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet		

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION	
0					SILT (ML), orange brown, dry			600	
5		Residuum						595	
10									590
15								585	
20					SANDY SILT (ML), tan orange, fine to medium grained, dry, micaceous			580	
25								575	
30		Saprolite			SILTY SAND (SM), tan, medium to coarse grained, dry, Felsic			570	
35									565
40									560
45								555	
50								550	
55					METAGRANITE, white tan, Felsic, Partially Weathered Rock			545	
60		Partially Weathered Rock			Tan brown orange, medium grained, very soft, trace clays, Partially Weathered Rock			540	
65									535
70									530
75								525	
80								520	
85								515	
90								510	
95									
100									

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	∇			
END OF DRILLING	∇			
AFTER DRILLING	∇	03/22/2023	45.0	Top of casing elevation 605.91 ft
AFTER DRILLING	∇			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 NE</b> <i>Sheet 2 of 5</i>	
<b>DATE:</b> 02/21/2023	<b>ELEVATION:</b> 604.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 403.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931479	<b>LONGITUDE:</b> -81.767249
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
105		Partially Weathered Rock			Tan brown orange, medium grained, very soft, trace clays, Partially Weathered Rock			500
110								
115								490
120								485
125								480
130								475
135								470
140	140.0							465
145		Rock			AMPHIBOLE GNEISS, Intermediate hardness; Mafic; Black/Gray			460
150								
155								450
160								445
165								440
170								435
175								430
180					Fracture: 175 ft, ~2 GPM			425
185								420
190								415
195								410
200								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	45.0	Top of casing elevation 605.91 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 NE</b> <i>Sheet 3 of 5</i>	
<b>DATE:</b> 02/21/2023	<b>ELEVATION:</b> 604.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 403.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931479	<b>LONGITUDE:</b> -81.767249
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION	
205	220.0	Rock			AMPHIBOLE GNEISS, Intermediate hardness; Mafic; Black/Gray			400	
210					Fracture: 210 ft, <2 GPM			395	
215								390	
220					AMPHIBOLE GNEISS, black gray green, Mafic/Intermediate			385	
225	260.0	Rock			Fracture: 220 ft, <2 GPM			380	
230								375	
235					Fracture: 235 ft, ~3 GPM			370	
240								365	
245								360	
250									355
255									350
260								AMPHIBOLE GNEISS, black, Mafic	345
265								340	
270									335
275									330
280								Fracture: 280 ft, <3 GPM	325
285								320	
290									315
295								Fracture: 290 ft, ~4 GPM	310
300									

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	45.0	Top of casing elevation 605.91 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 NE</b> <i>Sheet 4 of 5</i>	
<b>DATE:</b> 02/21/2023	<b>ELEVATION:</b> 604.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 403.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931479	<b>LONGITUDE:</b> -81.767249
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
305					AMPHIBOLE GNEISS, black, Mafic			300
310					Fracture: 310 ft, <4 GPM			295
315								290
320								285
325								280
330								275
335								270
340								265
345								260
350		Rock						255
355								250
360								245
365								240
370								235
375	375.0							230
380	380.0				METADIORITE, gray, Intermediate			225
385					AMPHIBOLE GNEISS, black gray, Mafic Fracture: 380 ft, ~6 GPM			220
390								215
395								210
400								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∑		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	45.0	Top of casing elevation 605.91 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
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<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 NE</b> <i>Sheet 5 of 5</i>	
<b>DATE:</b> 02/21/2023	<b>ELEVATION:</b> 604.7 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 403.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931479	<b>LONGITUDE:</b> -81.767249
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
403.0	403.0	Rock			AMPHIBOLE GNEISS, black gray, Mafic Bucket Test: ~6 GPM Bore Hole terminated at 403.0 feet			200
410								195
415								190
420								185
425								180
430								175
435								170
440								165
445								160
450								155
455								150
460								145
465								140
470								135
475								130
480								125
485								120
490								115
495								110
500								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	45.0	Top of casing elevation 605.91 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
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<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 SE</b> <i>Sheet 1 of 5</i>	
<b>DATE:</b> 03/01/2023	<b>ELEVATION:</b> 618.8 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931103	<b>LONGITUDE:</b> -81.767176
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
0		3.0			SANDY SILT (ML), brown tan, fine grained, moist, trace clay			614
5		8.0	Residuum		SANDY SILT (ML), brown tan, fine grained, moist, slight mica			609
10		16.0			SILTY SAND (SM), tan, fine grained, dry, micaceous			604
15					SILTY SAND (SM), tan brown, fine grained, moist, micaceous			599
20								594
25								589
30		31.0			POORLY GRADED SAND (SP), gray white, fine to coarse grained, dry			584
35								579
40			Partially Weathered Rock					574
45		46.0			SILTY SAND (SM), white tan brown, fine to coarse grained, dry, with small gravel, softer drilling			569
50		51.0			WELL-GRADED SAND (SW), tan brown, fine to coarse grained, dry, small to large gravel			564
55		57.0			SILTY SAND (SM), gray, fine to medium grained, moist			559
60								554
65								549
70								544
75		76.0			WELL-GRADED SAND (SW), gray brown, fine to coarse grained, moist, with small gravel			539
80								534
85		86.0			SILTY SAND (SM), gray brown, fine to medium grained, moist, micaceous			529
90		93.0	Saprolite					524
95			Partially Weathered Rock					
100		100.0			WELL-GRADED SAND (SW), gray tan, fine to coarse grained, moist, felsic gravel			

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	73.7	Top of casing elevation 621.01 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)

**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 SE</b> <i>Sheet 2 of 5</i>	
<b>DATE:</b> 03/01/2023	<b>ELEVATION:</b> 618.8 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931103	<b>LONGITUDE:</b> -81.767176
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
105		Saprolite			Gray tan, fine to coarse grained, moist, felsic gravel			514
110		Rock			AMPHIBOLE GNEISS, gray, fine, cuttings as SAND, mafic powder			509
115					METADIORITE, gray, Intermediate, cuttings as SAND			499
120					Fracture: 122 ft, 3 GPM			494
125					METAGRANITE, white gray, large gravel, felsic			489
130					Fracture: 130 ft, 10 GPM			484
135					Fracture: 135 ft to 136 ft, 30 GPM			479
140					Fracture: 138 ft to 139 ft, 30 GPM			474
145					AMPHIBOLE GNEISS, black, mafic, cuttings as fine sand			469
150					AMPHIBOLE GNEISS, hard, Intermediate; with felsic seams			464
155					Fracture: 170 ft, 40 GPM			459
160			Fracture: 179 ft, 40 GPM		454			
165					449			
170					444			
175					439			
180					434			
185					429			
190					424			
195								
200								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	73.7	Top of casing elevation 621.01 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



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<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 SE</b> <i>Sheet 3 of 5</i>	
<b>DATE:</b> 03/01/2023	<b>ELEVATION:</b> 618.8 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931103	<b>LONGITUDE:</b> -81.767176
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
205					GNEISS, Mafic, Intermediate			414
210								409
215	214.0				METAGRANITE, white, Felsic, cuttings as course sand, small gravel (10% mafic), softer zone 237-239 ft <i>Fracture: 214 ft, 45 GPM</i>			404
220								399
225					<i>Fracture: 218 ft, 45 GPM</i>			394
230								389
235								384
240								379
245								374
250	250.0	Rock			AMPHIBOLE GNEISS, fresh, Mafic, Intermediate, with felsic seams <i>Fracture: 250 ft, 45 GPM</i>			369
255								364
260								359
265	265.0				METADIORITE, fresh, Intermediate, slight feldspathic weathering			354
270	268.0				AMPHIBOLE GNEISS, fresh, Mafic, softer drilling			349
275	272.0				METADIORITE, fresh, Intermediate			344
280	279.0				AMPHIBOLE GNEISS, fresh, Mafic, feldspathic weathering			339
285								334
290								329
295								324
300	298.0				METADIORITE, Intermediate, weathered <i>Fracture: 298 ft to 302 ft, 50 GPM</i>			

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	73.7	Top of casing elevation 621.01 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 SE</b> <i>Sheet 4 of 5</i>	
<b>DATE:</b> 03/01/2023	<b>ELEVATION:</b> 618.8 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931103	<b>LONGITUDE:</b> -81.767176
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
302.0					METADIORITE, Intermediate, weathered AMPHIBOLE GNEISS, Mafic, weathering			314
305								309
310								304
315								299
320								294
325								289
330	328.0				METAGRANITE, felsic, Intermediate, feldspathic weathering, cuttings as course sand and small gravel; softer drilling			284
335	336.0				AMPHIBOLE GNEISS, Mafic			279
340	339.0				METAGRANITE, felsic; weathered, harder drilling, less cuttings			274
345								269
350								264
355								259
360	358.0				AMPHIBOLE GNEISS, Mafic, Intermediate with felsic seams, fresh			254
365	365.0				AMPHIBOLE GNEISS, Mafic, Intermediate, feldspathic weathering			249
370								244
375								239
380	378.0				AMPHIBOLE GNEISS, Mafic, fresh			234
385								229
390								224
395	396.0							
400	400.0				AMPHIBOLE GNEISS, Mafic, Intermediate; feldspathic weathering			

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	73.7	Top of casing elevation 621.01 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-100 SE</b> <i>Sheet 5 of 5</i>	
<b>DATE:</b> 03/01/2023	<b>ELEVATION:</b> 618.8 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931103	<b>LONGITUDE:</b> -81.767176
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
405					Bore Hole terminated at 400.0 feet			214
410								209
415								204
420								199
425								194
430								189
435								184
440								179
445								174
450								169
455								164
460								159
465								154
470								149
475								144
480								139
485								134
490								129
495								124
500								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	☒		
END OF DRILLING	☒		
AFTER DRILLING	☒ 03/22/2023	73.7	Top of casing elevation 621.01 ft
AFTER DRILLING	☒		

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-220</b> <i>Sheet 1 of 5</i>	
<b>DATE:</b> 02/27/2023	<b>ELEVATION:</b> 608.6 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931743	<b>LONGITUDE:</b> -81.767001
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
0		Residual			SILT (ML), orange brown, fine grained, moist, trace clay			604
5		Saprolite			SILT (ML), yellow orange, moist, trace saprolite clay			599
10					SILT (ML), yellow tan, moist			594
15		Partially Weathered Rock						589
20								584
25		Partially Weathered Rock			SANDY SILT (ML), brown tan, fine grained, very moist, filler			579
30								574
35		Partially Weathered Rock						569
40		Saprolite			SILT (ML), tan, fine to coarse grained, very moist			564
45								559
50		Saprolite						554
55		Partially Weathered Rock			SILTY SAND (SM), tan, fine to coarse grained, wet			549
60								544
65		Partially Weathered Rock			SILT (ML), tan brown, fine grained, wet, trace fine sand			539
70								534
75		Saprolite						529
80								524
85		Saprolite			SANDY SILT (ML), soft, tan, fine to coarse grained, wet			519
90								514
95								
100								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	54.4	Top of casing elevation 610.85 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-220</b> Sheet 2 of 5	
<b>DATE:</b> 02/27/2023	<b>ELEVATION:</b> 608.6 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931743	<b>LONGITUDE:</b> -81.767001
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
105		Saprolite			SANDY SILT (ML), soft, tan, fine to coarse grained, wet			504
110		Residualium			SANDY SILT (ML), fine grained, wet, cuttings saturated, mud			499
115		Partially Weathered Rock			SANDY SILT (ML), fine grained, wet			494
120					Poor return, casing set at 122 ft			489
125					AMPHIBOLE GNEISS, dry, Mafic, Intermediate, cuttings as powder			484
130								479
135								474
140					AMPHIBOLE GNEISS, black, dry, cuttings as powder/chips, fresh, water added			469
145								464
150								459
155								454
160		Rock			AMPHIBOLE GNEISS, black fresh, gray, dry, mafic/ Intermediate, fresh, cuttings as powder and coarse sand, hard drilling			449
165								444
170								439
175								434
180								429
185								424
190								419
195								414
200								414

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	54.4	Top of casing elevation 610.85 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

DATE: 02/27/2023	ELEVATION: 608.6 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.
EQUIPMENT: Schramm T450	DATUM: NAVD88	
OPERATOR: IET	DEPTH: 400.0 ft	
HAMMER TYPE:	CLOSURE:	
DRILLING METHOD:	LOGGED BY: Lyndal Butler	
SAMPLING METHOD:		PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
205			Rock		AMPHIBOLE GNEISS, Mafic, cuttings black chips, softer drilling			404
210	210.0					AMPHIBOLE GNEISS, black, Mafic, Intermediate, cuttings as chips; minimal weathering, with felsic seams <i>Fracture: 210 ft, &lt;1 GPM</i> <i>Fracture: 216 ft to 218 ft, 3-4 GPM</i>		399
215								394
220								389
225								384
230	230.0					AMPHIBOLE GNEISS, Mafic, Intermediate; cuttings as black chips with slight weathering; softer drilling		379
235								374
240								369
245							364	
250							359	
255	255.0				AMPHIBOLE GNEISS, black, harder drilling, fresh		354	
260							349	
265	265.0				METAGRANITE, Felsic; cuttings as white small gravel <i>Fracture: 265 ft, 5-6 GPM</i>		344	
270	270.0				AMPHIBOLE GNEISS AND METAGRANITE, Mafic with felsic seams; softer drilling 287-292 ft <i>Fracture: 298 ft, 5-6 GPM</i>		339	
275							334	
280							329	
285							324	
290							319	
295							314	
300								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	∑			
END OF DRILLING	∇			
AFTER DRILLING	∇	03/22/2023	54.4	Top of casing elevation 610.85 ft
AFTER DRILLING	∇			

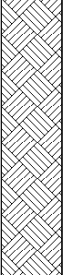
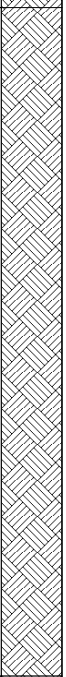
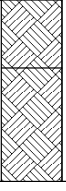
Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-220</b> <i>Sheet 4 of 5</i>	
<b>DATE:</b> 02/27/2023	<b>ELEVATION:</b> 608.6 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 400.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Lyndal Butler	<b>LATITUDE:</b> 34.931743	<b>LONGITUDE:</b> -81.767001
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION	
305		Rock			AMPHIBOLE GNEISS AND METAGRANITE, Mafic with felsic seams; softer drilling 287-292 ft			304	
310									299
315		PWR			AMPHIBOLE GNEISS, black, fresh, Mafic, PWR			294	
320									289
325	325.0								284
330									279
335									274
340									269
345							Fracture: 342 ft, 5-6 GPM		264
350									259
355									254
360									249
365		Rock			METAGRANITE, Felsic, cuttings as small gravel, weathered			244	
370									239
375									234
380								229	
385	384.0							224	
390	390.0							219	
395					AMPHIBOLE GNEISS, black, Mafic, Intermediate, fresh			214	
400	400.0								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	∇		
AFTER DRILLING	∇ 03/22/2023	54.4	Top of casing elevation 610.85 ft
AFTER DRILLING	∇		

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

**PROJECT:** River Bend Quarry Site  
Pacolet, South Carolina  
S&ME Project No. 22610504

**BORING LOG: B1-220**  
*Sheet 5 of 5*

**DATE:** 02/27/2023      **ELEVATION:** 608.6 ft

**EQUIPMENT:** Schramm T450      **DATUM:** NAVD88

**OPERATOR:** IET      **DEPTH:** 400.0 ft

**HAMMER TYPE:**      **CLOSURE:**

**DRILLING METHOD:**      **LOGGED BY:** Lyndal Butler      **LATITUDE:** 34.931743      **LONGITUDE:** -81.767001

**SAMPLING METHOD:**      **PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane South Carolina FIPS 3900 Feet

**NOTES:** Characterization based on air hammer cuttings.  
Estimated yields in gallons per minute (gpm) are cumulative.  
Casing: 6-5/8 inch diameter stainless steel.

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details		ELEVATION
405					Bore Hole terminated at 400.0 feet				204
410									199
415									194
420									189
425									184
430									179
435									174
440									169
445									164
450									159
455									154
460									149
465									144
470									139
475									134
480									129
485									124
490									119
495									114
500									

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	Σ			
END OF DRILLING	▼			
AFTER DRILLING	▼	03/22/2023	54.4	Top of casing elevation 610.85 ft
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
**LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-30</b> <i>Sheet 1 of 5</i>	
<b>DATE:</b> 02/15/2023	<b>ELEVATION:</b> 603.1 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 404.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931209	<b>LONGITUDE:</b> -81.767500
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
0					SILT (ML), tan brown, dry			599
5								594
10		10.0	Residuum		SILTY SAND (SM), tan, fine to medium grained, dry			589
15								584
20								579
25								574
30								569
35		35.0	Partially Weathered Rock		SILTY SAND (SM), tan, medium grained, dry			564
40								559
45		46.0	Partially Weathered Rock		METAGRANITE, light gray, felsic, moist, Partially Weathered Rock			554
50								549
55								544
60								539
65								534
70								529
75		74.0	Partially Weathered Rock		METAGRANITE, light gray, wet, felsic <i>Fracture: 75 ft, 2 GPM</i>			524
80								519
85					<i>Fracture: 84 ft, ~2 GPM</i>			514
90		90.0	Rock		AMPHIBOLE GNEISS, dark gray green, mafic <i>Fracture: 95 ft, 2 GPM</i>			509
95								
100								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	56.7	Top of casing elevation 604.27 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-30</b> <i>Sheet 2 of 5</i>	
<b>DATE:</b> 02/15/2023	<b>ELEVATION:</b> 603.1 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 404.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931209	<b>LONGITUDE:</b> -81.767500
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
105					AMPHIBOLE GNEISS, dark gray green, Mafic			499
110								494
115								489
120	120.0				AMPHIBOLE GNEISS, dark gray black, Mafic			484
125								479
130								474
135								469
140								464
145								459
150								454
155								449
160								444
165								439
170					Fracture: 169 ft to 172 ft, 7 GPM			434
175								429
180								424
185								419
190								414
195								409
200	200.0							

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	Σ			
END OF DRILLING	▼			
AFTER DRILLING	▼	03/22/2023	56.7	Top of casing elevation 604.27 ft
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**



DATE: 02/15/2023	ELEVATION: 603.1 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.
EQUIPMENT: Schramm T450	DATUM: NAVD88	
OPERATOR: IET	DEPTH: 404.0 ft	
HAMMER TYPE:	CLOSURE:	
DRILLING METHOD:	LOGGED BY: Cody McMechen	
SAMPLING METHOD:		LATITUDE: 34.931209 LONGITUDE: -81.767500
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet		

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
205	207.0	Rock			METAGRANITE, white, Felsic			399
210	212.0				METADIORITE, gray, Intermediate			394
215					Fracture: 210 ft to 215 ft, 7 GPM			389
220					AMPHIBOLE GNEISS, dark gray, Mafic			384
225					Fracture: 225 ft, 7 GPM			379
230					Fracture: 232 ft, 7 GPM			374
235								369
240								364
245								359
250								354
255						349		
260						344		
265						339		
270						334		
275						329		
280						324		
285						319		
290						314		
295						309		
300								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD	∅		
END OF DRILLING	▼		
AFTER DRILLING	▼ 03/22/2023	56.7	Top of casing elevation 604.27 ft
AFTER DRILLING	▼		

Vertical Accuracy: Land Survey (0.1 ft)

**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING**  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)



<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-30</b> Sheet 4 of 5	
<b>DATE:</b> 02/15/2023	<b>ELEVATION:</b> 603.1 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 404.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen		
<b>SAMPLING METHOD:</b>	<b>PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane South Carolina FIPS 3900 Feet</b>		

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
305	307.0	Rock			AMPHIBOLE GNEISS, dark gray, Mafic			299
310	312.0				METADIORITE, gray light gray, Intermediate			294
315					AMPHIBOLE GNEISS, dark gray, Mafic <i>Fracture: 312 ft, 7 GPM</i>			289
320								284
325								279
330								274
335								269
340								264
345								259
350								254
355						249		
360						244		
365						239		
370						234		
375	374.0 376.0				<i>Fracture: 372 ft, 7 GPM</i> METADIORITE, gray, Intermediate AMPHIBOLE GNEISS, dark gray, Mafic		229	
380							224	
385							219	
390	390.0				AMPHIBOLE GNEISS, dark gray green, Intermediate to mafic <i>Fracture: 390 ft, 7 GPM</i>		214	
395							209	
400								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING	03/22/2023	56.7	Top of casing elevation 604.27 ft
AFTER DRILLING			

Vertical Accuracy: Land Survey (0.1 ft)



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)

<b>PROJECT:</b> River Bend Quarry Site Pacolet, South Carolina S&ME Project No. 22610504		<b>BORING LOG: B1-30</b> <i>Sheet 5 of 5</i>	
<b>DATE:</b> 02/15/2023	<b>ELEVATION:</b> 603.1 ft	<b>NOTES:</b> Characterization based on air hammer cuttings. Estimated yields in gallons per minute (gpm) are cumulative. Casing: 6-5/8 inch diameter stainless steel.	
<b>EQUIPMENT:</b> Schramm T450	<b>DATUM:</b> NAVD88		
<b>OPERATOR:</b> IET	<b>DEPTH:</b> 404.0 ft		
<b>HAMMER TYPE:</b>	<b>CLOSURE:</b>		
<b>DRILLING METHOD:</b>	<b>LOGGED BY:</b> Cody McMechen	<b>LATITUDE:</b> 34.931209	<b>LONGITUDE:</b> -81.767500
<b>SAMPLING METHOD:</b>		<b>PROJECT COORDINATE SYSTEM -</b> NAD 1983 StatePlane South Carolina FIPS 3900 Feet	

Depth (feet)	NOTES	DEPOSITIONAL ENVIRONMENT	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	Well Details	ELEVATION
405	404.0	Rock			AMPHIBOLE GNEISS, dark gray green, Intermediate to mafic Bore Hole terminated at 404.0 feet			199
410								194
415								189
420								184
425								179
430								174
435								169
440								164
445								159
450								154
455								149
460								144
465								139
470								134
475								129
480								124
485								119
490								114
495								109
500								

GROUNDWATER	DATE	DEPTH (FT)	REMARKS
ATD			
END OF DRILLING			
AFTER DRILLING		03/22/2023	56.7
AFTER DRILLING			Top of casing elevation 604.27 ft

Vertical Accuracy: Land Survey (0.1 ft)



**GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING  
 LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf)**



**Water Well Record**  
**Bureau of Water**  
 2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

*Note: Personal information provided on this document is subject to public scrutiny or release.*

<b>1. WELL OWNER INFORMATION:</b> Name: Jack Mitchell / Synergy Materials LLC (last) (first) Address: 1010 Hammett Grove Rd City: Spartanburg State: SC Zip: 29307-0000 Telephone: Work: 864-595-9900 Home:		<b>7. PERMIT NUMBER:</b>																																																																							
<b>2. LOCATION OF WELL: COUNTY: Spartanburg</b> Name: Street Address: 1010 Hammett Grove Rd City: Spartanburg Zip: 29307-0000 Latitude: Longitude:		<b>8. USE:</b> <input type="checkbox"/> Residential <input type="checkbox"/> Public Supply <input type="checkbox"/> Process <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Emergency <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> Monitor Well <input type="checkbox"/> Replacement																																																																							
<b>3. PUBLIC SYSTEM NAME: PUBLIC SYSTEM NUMBER:</b> B1		<b>9. WELL DEPTH (completed)</b> Date Started: 3-23 402 ft. Date Completed: 3-23																																																																							
<b>4. ABANDONMENT:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Give Details Below Grouted Depth: from _____ ft. to _____ ft.		<b>10. CASING:</b> <input checked="" type="checkbox"/> Threaded <input type="checkbox"/> Welded Diam.: 6" Type: <input type="checkbox"/> PVC <input type="checkbox"/> Galvanized <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Other 6" in. to 62 ft. depth _____ in. to _____ ft. depth																																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:75%;">Formation Description</th> <th style="width:12.5%;">*Thickness of Stratum</th> <th style="width:12.5%;">Depth to Bottom of Stratum</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum																																																																			<b>11. SCREEN:</b> Type: NA Diam.: _____ Slot/Gauge: _____ Length: _____ Set Between: _____ ft. and _____ ft. _____ ft. and _____ ft. <b>NOTE: MULTIPLE SCREENS USE SECOND SHEET</b> Sieve Analysis <input type="checkbox"/> Yes (please enclose) <input checked="" type="checkbox"/> No		
Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum																																																																							
<b>5. REMARKS:</b>		<b>12. STATIC WATER LEVEL</b> _____ ft. below land surface after 24 hours <b>13. PUMPING LEVEL</b> Below Land Surface. _____ ft. after _____ hrs. Pumping _____ G.P.M. Pumping Test: <input type="checkbox"/> Yes (please enclose) <input checked="" type="checkbox"/> No Yield: _____																																																																							
<b>6. TYPE:</b> <input type="checkbox"/> Mud Rotary <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/> Dug <input checked="" type="checkbox"/> Air Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Cable tool <input type="checkbox"/> Other		<b>14. WATER QUALITY</b> Chemical Analysis <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Bacterial Analysis <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please enclose lab results. <b>15. ARTIFICIAL FILTER (filter pack)</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Installed from _____ ft. to _____ ft. Effective size _____ Uniformity Coefficient _____																																																																							
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		<b>16. WELL GROUTED?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input checked="" type="checkbox"/> Bentonite/Cement <input type="checkbox"/> Other _____ Depth: From 50 ft. to 0 ft.																																																																							
5. REMARKS:		<b>17. NEAREST SOURCE OF POSSIBLE CONTAMINATION:</b> _____ ft. _____ direction Type _____ Well Disinfected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Type: _____ Amount: _____																																																																							
5. REMARKS:		<b>18. PUMP:</b> Date installed: _____ Not installed <input checked="" type="checkbox"/> Mfr. Name: _____ Model No.: _____ H.P. _____ Volts _____ Length of drop pipe _____ ft. Capacity _____ gpm TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet (shallow) <input type="checkbox"/> Turbine <input type="checkbox"/> Jet (deep) <input type="checkbox"/> Reciprocating <input type="checkbox"/> Centrifugal																																																																							
5. REMARKS:		<b>19. WELL DRILLER: Randy Phillips CERT. NO.: 1096-A</b> Address: (Print) Level: A B C D (circle one) 30 Grant Park Place Piedmont, SC 29673 Telephone No.: 864-288-1986 Fax No.: 864-288-2272																																																																							
5. REMARKS:		<b>20. WATER WELL DRILLER'S CERTIFICATION:</b> This well was drilled under my direction and this report is true to the best of my knowledge and belief.																																																																							
5. REMARKS:		Signed: _____ Date: 4/18/23 Well Driller																																																																							
5. REMARKS:		If D Level Driller, provide supervising driller's name:																																																																							





Water Well Record
Bureau of Water

2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

Note: Personal information provided on this document is subject to public scrutiny or release.

1. WELL OWNER INFORMATION:
Name: Jack Mitchell / Synergy Materials LLC
Address: 1010 Hammett Grove Rd
City: Spartanburg State: SC Zip: 29307-0000

7. PERMIT NUMBER:

8. USE:
Residential, Public Supply, Process, Irrigation, Air Conditioning, Emergency, Test Well, Monitor Well, Replacement

2. LOCATION OF WELL: COUNTY: Spartanburg
Name:
Street Address: 1010 Hammett Grove Rd
City: Spartanburg Zip: 29307-0000

9. WELL DEPTH (completed) Date Started: 3-23
404 ft. Date Completed: 3-23

10. CASING: [X] Threaded [ ] Welded
Diam.: 6"
Type: [ ] PVC [ ] Galvanized [X] Steel [ ] Other

3. PUBLIC SYSTEM NAME: PUBLIC SYSTEM NUMBER: B1-30

11. SCREEN:
Type: NA Diam.:
Slot/Gauge: Length:
Set Between: ft. and ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET

4. ABANDONMENT: [ ] Yes [X] No
Give Details Below
Grouted Depth: from ft. to ft.

Table with 3 columns: Formation Description, Thickness of Stratum, Depth to Bottom of Stratum. Multiple rows for data entry.

12. STATIC WATER LEVEL ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
ft. after hrs. Pumping G.P.M.
Pumping Test: [ ] Yes (please enclose) [X] No

14. WATER QUALITY
Chemical Analysis [ ] Yes [X] No Bacterial Analysis [ ] Yes [X] No

15. ARTIFICIAL FILTER (filter pack) [ ] Yes [X] No
Installed from ft. to ft.
Effective size Uniformity Coefficient

16. WELL GROUTED? [X] Yes [ ] No
Neat Cement [ ] Bentonite [X] Bentonite/Cement [ ] Other

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ft direction
Type
Well Disinfected [ ] Yes [X] No Type: Amount:

18. PUMP: Date installed: Not installed [X]
Mfr. Name: Model No.:
H.P. Volts Length of drop pipe ft. Capacity gpm

19. WELL DRILLER: Randy Phillips CERT. NO.: 1096-A
Address: (Print) Level: A B C D (circle one)
30 Grant Park Place
Piedmont, SC 29673
Telephone No.: 864-288-1986 Fax No.: 864-288-2272

\*Indicate Water Bearing Zones
(Use a 2nd sheet if needed)

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under
my direction and this report is true to the best of my knowledge and belief.

5. REMARKS:

Signed: Randy Phillips Date: 4/18/23

6. TYPE: [ ] Mud Rotary [ ] Jetted [ ] Bored
[ ] Dug [X] Air Rotary [ ] Driven
[ ] Cable tool [ ] Other

If D Level Driller, provide supervising driller's name:



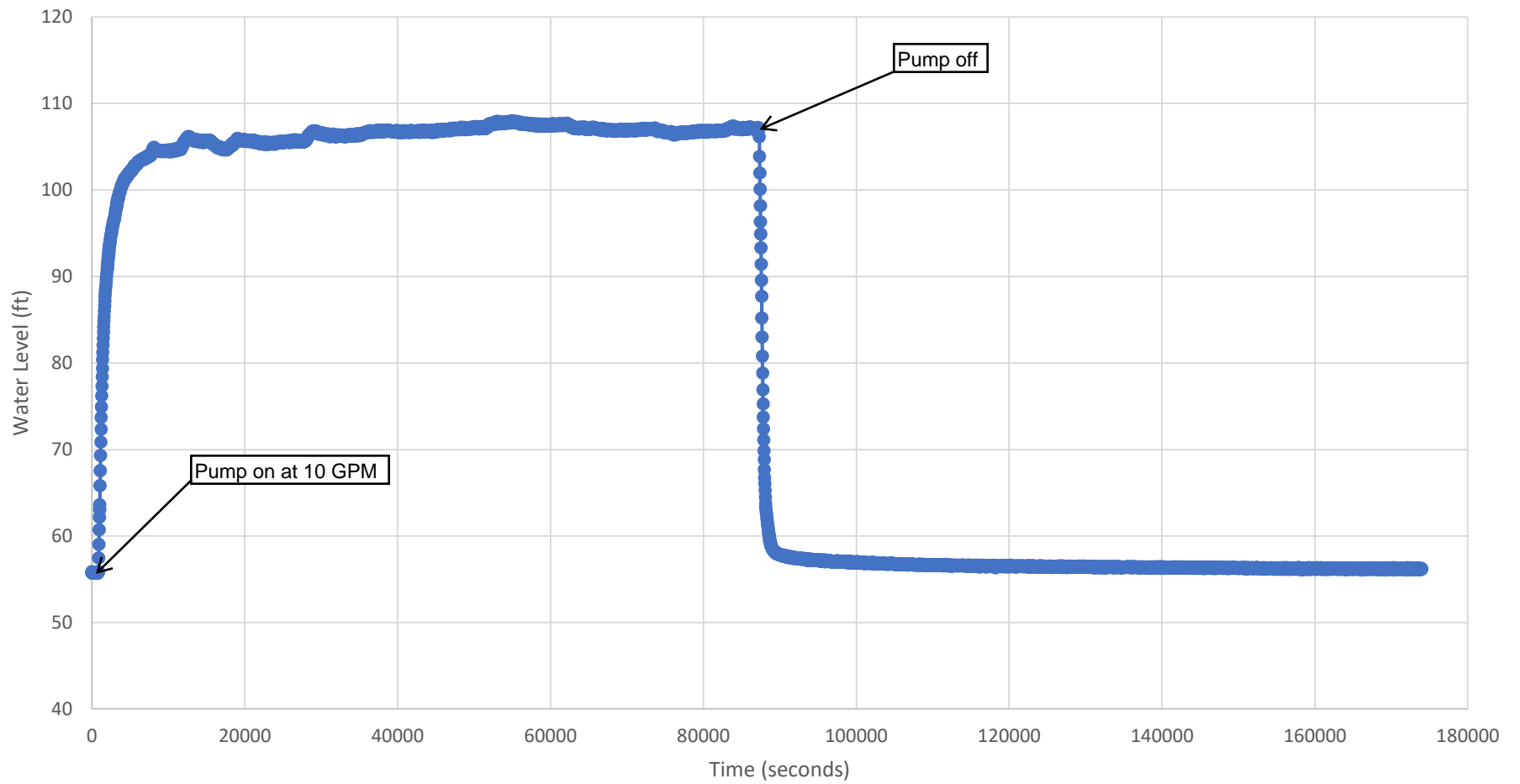




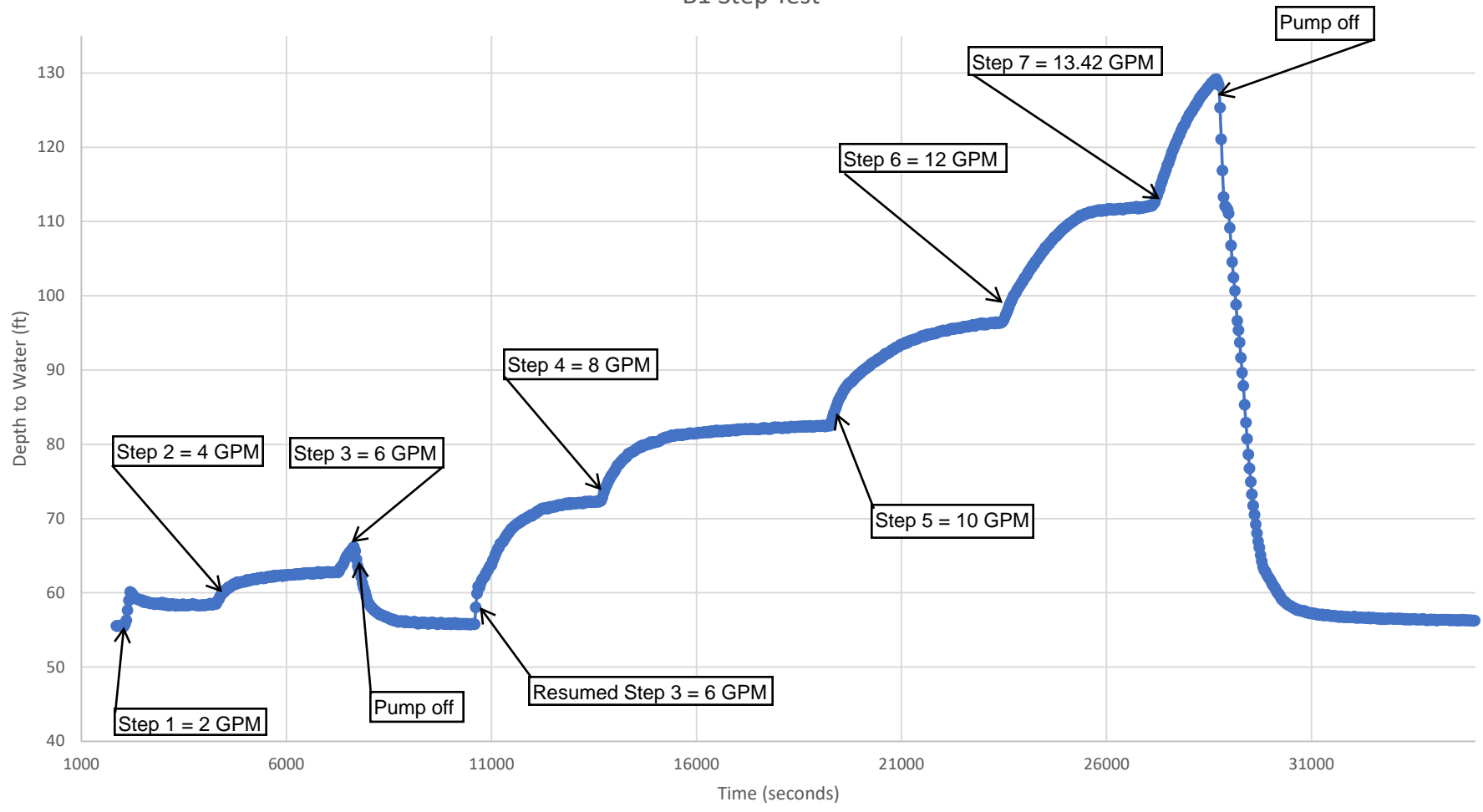


## **Appendix V – Pump Test Charts**

B1 Constant Rate Pump Test



### B1 Step Test



### B1 100 SE Step Test

