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MEMORANDUM

Date: October 5, 2022

To: Josh Whitney, Vulcan Materials Company (Vulcan)
Elliott Botzis, Vulcan Materials Company

From: Joshua Simpson, P.G., GZA GeoEnvironmental, Inc.
Mark Krumenacher, P.G., GZA GeoEnvironmental, Inc.

File No.: 20.0157528.00

Re: August 2022 Subsurface Investigation
Vulcan Orangeburg Quarry ("Site")
Orangeburg County, South Carolina

In accordance with Contract Addendum No. 1 dated March 15, 2022, GZA GeoEnvironmental, Inc. (GZA) performed a subsurface investigation at the above referenced Site. The objectives of the subsurface investigation were to:

- Evaluate the bedrock surface elevation in two areas (termed "northern area" and "southern area");
- Assess the hydrogeologic properties (e.g., hydraulic conductivity) of the overburden;
- Obtain groundwater elevation data in multiple areas of the Site to better assess local groundwater flow conditions;
- Deploy transducers to collect water level data over time, which can be utilized to further assess baseline conditions prior to potential quarry operations; and
- Utilize the data collected during this investigation to assess potential future refinements to the numerical groundwater flow model developed for the Site.

This work and technical memorandum are subject to the limitations provided in **Attachment 1**.

BACKGROUND

Using prior Site corehole data, a bedrock surface elevation map was extrapolated for the Site. In early 2022, GZA incorporated the extrapolated bedrock surface elevations in a Site-specific groundwater flow model to evaluate dewatering rates and allowable extents of a potential quarry for varying dewatering elevations. An important condition of the prior modeling efforts is that the water level at the property boundary needed to remain at least 3 feet above the extrapolated bedrock surface during simulated quarry dewatering. Due to this condition, the simulated allowable areal extent of the quarry were restricted by areas of higher bedrock surface elevations at the property boundary. As a result, the August 2022 subsurface investigation was performed at the areas of higher extrapolated bedrock surface elevations to assess the accuracy of those extrapolated elevations.



In addition, Site-specific hydraulic conductivity data was previously unavailable for the overburden. The simulated water reinjection rates at the property boundary, and the quarry dewatering rates, are directly related to this input parameter. Therefore, hydraulic testing at newly-installed monitoring wells screened within the overburden was also performed as part of this subsurface investigation.

AUGUST 2022 SUBSURFACE INVESTIGATION

On August 15, 2022, GZA and Elite Techniques, Inc. (Elite), our drilling subcontractor, mobilized to the Site to initiate the subsurface investigation. The following summarizes the work performed as part of the August 2022 subsurface investigation:

- 1) Elite advanced 17 soil boreholes to bedrock (10 locations) or to approximately five feet above bedrock (7 locations). Eleven boreholes were completed near the property boundary north of the potential quarry (northern area) and six boreholes were completed along the southern property boundary (southern area).
- 2) At the seven boreholes advanced to approximately five feet above bedrock, Elite installed 2-inch PVC monitoring wells screened within the overburden. Four wells were installed in the northern area, and three were installed in the southern area.
- 3) GZA developed the wells by purging dry multiple times using a Waterra foot valve/surge block. Following well development, in-well hydraulic testing was performed to estimate the hydraulic conductivity of the overburden.
- 4) GZA estimated the soil boring/monitoring well coordinates using a GPS unit and elevations based on Light Detection and Ranging (LiDAR) data available from the South Carolina Department of Natural Resources.
- 5) GZA measured water levels in each well and installed pressure transducers in one north and one south monitoring well.

DRILLING PROGRAM

Prior to the initiation of field exploration activities, GZA and Vulcan reviewed the general drilling locations at the Site. Based on these discussions and due to access limitations, a portion of the drilling locations in the southern area were shifted to the north/northeast. The investigation locations are presented on **Figure 1**.

Direct push drilling techniques were performed by Elite using a Geoprobe 7822DT track-mounted rig. Each borehole was advanced until Geoprobe refusal was observed. Elite routinely utilizes this method in the region to estimate the depth to top of bedrock. During borehole advancement, soil samples were continuously collected using 5-foot sleeves. Drilling activities were observed by a GZA scientist on a full-time basis to document drilling observations and describe soil samples. In general, the overburden soils were described as silt with some fine sand and clay. Gravel, weathered limestone, was encountered above the bedrock. The soil boring logs are presented in **Attachment 2**.

GZA's field scientist also recorded the depth to bedrock for each borehole location, based upon Geoprobe refusal. The estimated bedrock surface elevations from this drilling program are lower than previous corehole data included in the groundwater flow model. As a result, the recent drilling data provides valuable data in previously unexplored areas. Note that "weathered limestone" elevations (as recorded by others) were conservatively used to extrapolate the prior bedrock surface map.

A lower bedrock surface elevation in these two areas would likely increase the simulated allowable areal extents of the quarry for varying dewatering elevations. **Figure 2** presents a comparison of the previously extrapolated bedrock surface map and an extrapolated bedrock surface map that incorporates the August 2022 data. A comparison of the August 2022 data to the nearby corehole data is presented in the following table.



Drilling Area	Investigation Program	Location ID	Bedrock Surface Elevation (feet; NAVD 88)
Northern	August 2022	North-1	58.5
		North-2	57.5
		North-3	58.0
		North-4	59.5
		North-5	62.5
		North-6	64.0
		North-7	62.0
	Prior Investigation	19-019	"Weathered" – 68.5 "Fresh" – 64.0
		19-020	"Weathered" – 69.0 "Fresh" – 67.0
Southern	August 2022	South-1	54.5
		South-2	54.0
		South-3	53.5
	Prior Investigation	19-013	"Weathered" – 61.5 "Fresh" – NR
		19-015	"Weathered" – 66.5 "Fresh" – 66.0

Four overburden monitoring wells (MW-4 through MW-7) were installed in the northern area. An additional three overburden monitoring wells (MW-8 through MW-10) were installed in the southern area. For each monitoring well installation, Elite advanced a borehole using 4 ¼-inch ID hollow stem augers (HSA) near a previously completed Geoprobe borehole. The bottom of each HSA borehole was approximately 5 feet above the recorded bedrock surface from the nearby Geoprobe borehole. For each well, a 5-foot section of 2-inch diameter, schedule 40 PVC well screen was connected to solid 2-inch PVC riser pipe. The annular space surrounding the PVC was filled with a sand filter pack to approximately 2 feet above the top of the screen. A 2-foot thick bentonite seal was installed above the sand filter pack. In conformance with South Carolina regulations, the remainder of the annular space was grouted to the ground surface. Each well was completed with a 2- to 4-foot stickup protective casing, including a locking cap, which was cemented in a concrete surface pad. The monitoring well installation logs are provided in **Attachment 3**.

Following well installation, GZA developed the monitoring wells to establish a better hydraulic connection between the monitoring well, filter pack, and surrounding soils. Each monitoring well was developed using a pumping and surging technique using a Waterra foot valve and/or Waterra surge block. After initiating the development process, GZA more rigorously removed fine particulates from the well/filter pack using the Waterra foot valve (without a surge block). The foot valve was initially placed near the top of the screen and subsequently moved downwards as the amount of suspended fines in the purge water decreased. Purge water was discharged at the ground surface, away from the concrete surface pad. Due to the lower permeability of the overburden, the wells were pumped dry multiple times during the development process (4-5 times in northern area; 2 times in southern area). GZA resumed development after the water level recovered to near static conditions in the well.



HYDRAULIC CONDUCTIVITY TESTING

GZA performed hydraulic conductivity (K) testing in MW-4, MW-6, MW-9, and MW-10 to evaluate the hydrogeologic properties of the overburden. Two separate rising and falling head K tests (i.e., slug tests)¹ were performed at each well. During the testing, groundwater elevations in the test well were monitored using a pressure transducer. This instrument automatically recorded pressure (converted to water level) and temperature data at a user-specified time interval (e.g., one reading per second). Near the start and end of each test, manual water level readings were also collected by GZA.

The following procedure was generally followed for each falling head slug test:

- 1) The pressure transducer was deployed within the well and set within 0.5 feet from the bottom of the well screen. The transducer was set to record pressure/temperature data throughout the testing.
- 2) The slug was lowered into the well using a line/rope to the “pre-test” position, directly above the static water level within the well.
- 3) The slug was rapidly submerged below the static water level and the line/rope was secured at the ground surface so the slug remained at a constant position (“test” position).
- 4) The pressure transducer’s water level readings were reviewed as the water level within the well lowered back to static conditions.

Once near-static water levels were observed, the slug was quickly removed from the water column to perform the rising head slug test. After near-static water levels were observed, the slug was then lowered back into the well for the second falling/rising head test at each location.

The K testing data was analyzed using AQTESOLV and the Bouwer and Rice slug test solution² for fully penetrating wells in an unconfined aquifer. The AQTESOLV solution fits are presented in **Attachment 4**. As presented in the following table, the estimated K_h (horizontal hydraulic conductivity) of the overburden in the vicinity of the tested wells ranges between approximately 0.1 and 2 feet/day.

¹ A “slug” refers to any object that can be lowered into a monitoring well to displace water within the well casing. As a result, the water level will rise within the well. When the slug is removed, the water level will decrease in the well. For this project, rebar was used as the slug.

² Bouwer, H. and Rice, R.C., 1976; A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells; Water Resources Research, Vol. 12, pp 423-428.



Well ID	Test	K_h (ft/day)	Average K_h (ft/day)	Geometric Mean K_h (ft/day)
MW-4	Falling 1	1.9	1.8	1.7
	Falling 2	1.9		
	Rising 1	1.8		
	Rising 2	1.4		
MW-6	Falling 1	0.9	0.5	0.4
	Falling 2	0.6		
	Rising 1	0.2		
	Rising 2	0.2		
MW-9	Falling 1	0.2	0.1	0.1
	Falling 2	0.02		
	Rising 1	0.05		
	Rising 2	0.05		
MW-10	Falling 1	0.15	0.2	0.2
	Falling 2	0.2		
	Rising 1	0.3		
	Rising 2	0.2		

Within the groundwater flow model, the simulated K_h for overburden is currently 3 feet/day. Therefore, the Site K testing results support the conclusion that the overburden’s hydraulic conductivity may be one order of magnitude lower than the currently simulated hydraulic conductivity. As a result, the modeled reinjection rates for surface trenches likely represent an upper bound estimate within the model. Furthermore, the water extracted for quarry dewatering may not adequately infiltrate into the shallow soils via surface trenches. These conditions could be further evaluated with model sensitivity simulations.

Note that lower simulated quarry dewatering rates could also be anticipated if the overburden K is decreased in the model. However, the overall dewatering rates are primarily influenced by the hydraulic properties of the underlying limestone.

INVESTIGATION LOCATION COORDINATES/ELEVATIONS AND WATER LEVEL DATA

GZA collected horizontal coordinates and vertical elevation data for each investigation location using a Trimble R2 RTK receiver. The GPS unit recorded a vertical inaccuracy of greater than three feet at several locations (e.g., North-3, MW-9, MW-10). The accuracy was primarily influenced by trees and overhead cover at these locations. Given these inaccuracies, GZA compared the vertical elevations collected by the GPS unit to previous elevation data, including LiDAR data for the Site area. The LiDAR data has a vertical accuracy of approximately 0.3 to 0.6 feet and utilizes the same vertical datum as the groundwater flow model developed for the Site. Based on this comparison, the recently collected GPS elevations were consistently lower than the prior LiDAR data for the site. Therefore, GZA used the existing LiDAR data and stick-up measurements recorded in the field to estimate the vertical elevations for the investigation locations. The horizontal coordinates and vertical elevation data for the investigation locations are presented in **Table 1**.

On August 19, 2022, GZA performed a comprehensive groundwater level gauging round of the preexisting and newly installed Site monitoring wells. At each monitoring point, field personnel measured and recorded the depth to water, the total depth of the well, and the time of measurement. The water level measurements were completed using an electronic water level meter, with an accuracy of 0.01 feet. These depth to water measurements were converted to groundwater



elevations using the top of casing elevations, which were estimated from LiDAR data. The groundwater elevation data are presented in **Table 2**.

As summarized in the table, the measured groundwater elevations are highest in the northern area and lowest in the southern area. Therefore, the data suggests a south/southeast groundwater flow direction, which is consistent with the numerical model. The groundwater flow model indicates that the Site area groundwater elevations are influenced (lowered) by dewatering at the nearby Martin Marietta quarry, located southeast of the Site.

On August 19, 2022, GZA deployed pressure transducers at MW-6 and MW-9 to record water level data over time. These instruments were programmed to automatically record data every two hours. This data can be downloaded in the future to review baseline (pre-quarry) groundwater conditions at the Site, including potential changes in groundwater elevations that may be related to the proposed expansion of the nearby Martin Marietta quarry.

RECOMMENDATIONS TO CONSIDER FOR FUTURE WORK

As presented above, the August 2022 subsurface investigation was performed (in part) to: 1) assess the bedrock surface elevation in the northern and southern drilling areas; and 2) evaluate the hydrogeologic properties of the overburden. These two conditions/parameters were estimated in GZA's prior numerical modeling efforts due to the lack of existing Site-specific data. The results of the recent subsurface investigation support the conclusion that the actual bedrock surface is lower than the previously interpolated surface in both the northern and southern areas. A lower bedrock surface elevation in these two areas would likely increase the modeled allowable areal extents of the quarry for varying dewatering elevations.

In addition, the Site hydraulic conductivity testing results are up to one order of magnitude lower than that modeled for the overburden. The previously modeled hydraulic conductivity was based on general soil descriptions provided by others because Site-specific testing results were previously unavailable. The hydraulic conductivity of the overburden will influence the modeled reinjection rates at surface trenches, the zone of influence within the overburden, and the dewatering rates for the quarry.

Based on these results, GZA could refine the model input parameters (e.g., hydraulic properties of the overburden, bedrock surface elevations) to enhance the model results. During these efforts, GZA would specifically evaluate the simulated total quarry dewatering rates, simulated maximum allowable mining extents, and simulated reinjection rates at the property boundary to further evaluate the practicability of surface reinjection trenches. These modeling efforts would require a budget increase of approximately \$7,500, which includes a brief memorandum that would summarize the model refinements and associated results.

ATTACHMENTS

Table 1 – Investigation Locations Summary Table

Table 2 – Groundwater Elevation Measurements

Figure 1 – Investigation Locations

Figure 2 – Bedrock Surface Elevation Maps

Attachment 1 – Limitations

Attachment 2 – Soil Boring Logs

Attachment 3 – Monitoring Well Installation Logs

Attachment 4 – AQTESOLV Hydraulic Conductivity Testing Results



TABLES

TABLE 1 INVESTIGATION LOCATIONS SUMMARY TABLE.

Proposed Vulcan Materials Company Quarry
Orangeburg, South Carolina

Location ID	Type	Location	Northing (feet) ¹	Easting (feet) ¹	Reference Elevation (feet) ²
North-1	Soil Boring	North Area	557665.5	2216515.5	85.5
North-2	Soil Boring		557692.0	2216798.0	86.0
North-3	Soil Boring		557714.5	2217008.0	86.0
North-4	Soil Boring		557734.0	2217193.5	87.0
North-5	Soil Boring		557728.5	2217353.5	87.0
North-6	Soil Boring		557748.0	2217574.5	87.5
North-7	Soil Boring		557778.5	2217904.0	87.5
MW-4	Monitoring Well	North, Adjacent to North -1	557667.0	2216527.5	88.3
MW-5	Monitoring Well	North, Adjacent to North -3	557714.5	2217007.5	89.4
MW-6	Monitoring Well	North, Adjacent to North -6	557741.0	2217494.0	90.8
MW-7	Monitoring Well	North, Adjacent to North -7	557779.5	2217904.5	90.8
MW-1S	Monitoring Well	Central Area	555515.0	2216615.5	89.5
MW-1D	Monitoring Well		555510.5	2216618.5	89.0
MW-2S	Monitoring Well		555493.0	2216706.5	89.0
MW-2D	Monitoring Well		555499.0	2216704.0	89.0
MW-3D	Monitoring Well		555535.5	2216635.0	89.0
South-1	Soil Boring	South Area	554898.0	2219714.0	88.0
South-2	Soil Boring		554748.0	2219498.5	88.0
South-3	Soil Boring		554633.5	2219048.5	88.0
MW-8	Monitoring Well	South, Adjacent to South-1	554641.5	2219038.5	89.7
MW-9	Monitoring Well	South, Adjacent to South-2	554761.0	2219508.0	89.6
MW-10	Monitoring Well	South, Adjacent to South-3	554898.0	2219710.0	89.8

Notes

1. Horizontal datum: South Carolina State Plane (US Survey feet), FIPS 3900, NAD 1983. GZA personnel used a Trimble R2 RTK GPS unit to obtain the northing and easting coordinates on August 18, 2022.
2. Reference elevation = ground surface elevation for soil borings and top of casing elevation for monitoring wells. Due to GPS inaccuracies, reference elevations were estimated from LiDAR data (NAVD 88) and field-measured casing stickup heights.

TABLE 2 Groundwater Elevations.
Proposed Vulcan Materials Company Quarry
Orangeburg, South Carolina

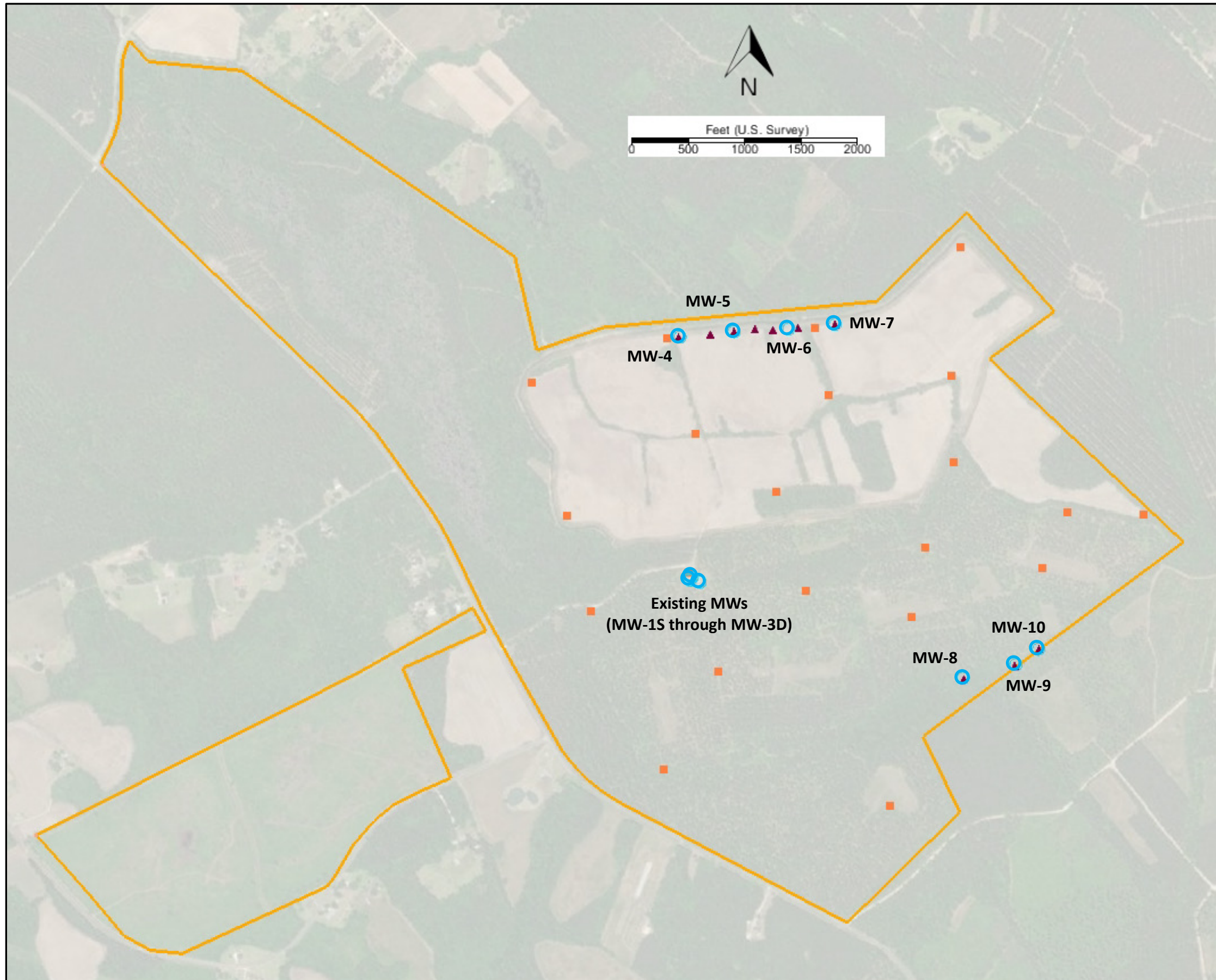
Site Area	Location ID	Ground Surface Elevation (feet)	Stick-up Height (feet)	Top of Casing Elevation (feet)	Total Depth (feet below TOC)	Date	Time	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)
North	MW-4	85.5	2.8	88.3	24.8	8/19/2022	1108	7.10	81.2
						8/19/2022	1134	7.10	81.2
	MW-5	86.0	3.4	89.4	26.4	8/19/2022	1800	7.25	82.2
	MW-6	87.5	3.3	90.8	22.3	8/19/2022	1050	8.35	82.5
						8/19/2022	1145	8.35	82.5
MW-7	87.5	3.3	90.8	23.3	8/19/2022	1040	8.46	82.3	
Central	MW-1S	Installed by Others (TOC Elevation Reported)		89.5	40.0	8/19/2022	945	9.80	79.7
	MW-1D			89.0	88.6	8/19/2022	947	9.50	79.5
	MW-2S			89.0	37.7	8/19/2022	953	9.06	79.9
	MW-2D			89.0	92.1	8/19/2022	949	9.72	79.3
	MW-3D			89.0	90.6	8/19/2022	942	9.45	79.6
South	MW-8	86.5	3.2	89.7	30.2	8/19/2022	1004	12.75	77.0
	MW-9	86.5	3.1	89.6	31.1	8/19/2022	1007	12.94	76.7
						8/19/2022	1415	12.94	76.7
	MW-10	86.5	3.3	89.8	32.3	8/19/2022	1012	12.91	76.9
						8/19/2022	1425	12.92	76.9

Notes

1. Due to GPS inaccuracies, elevations were estimated from LiDAR data (NAVD 88) and field-measured casing stickup heights.
2. GZA personnel manually measured depth to groundwater at the dates/times indicated. Water levels are anticipated to fluctuate over time based on responses to precipitation events, localized groundwater withdrawals, evapotranspiration, etc.



FIGURES



LEGEND

- PROPERTY BOUNDARY
- PRIOR COREHOLE
- ▲ SOIL BORING
- MONITORING WELL

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VULCAN ORANGEBURG QUARRY
ORANGEBURG COUNTY, SOUTH CAROLINA

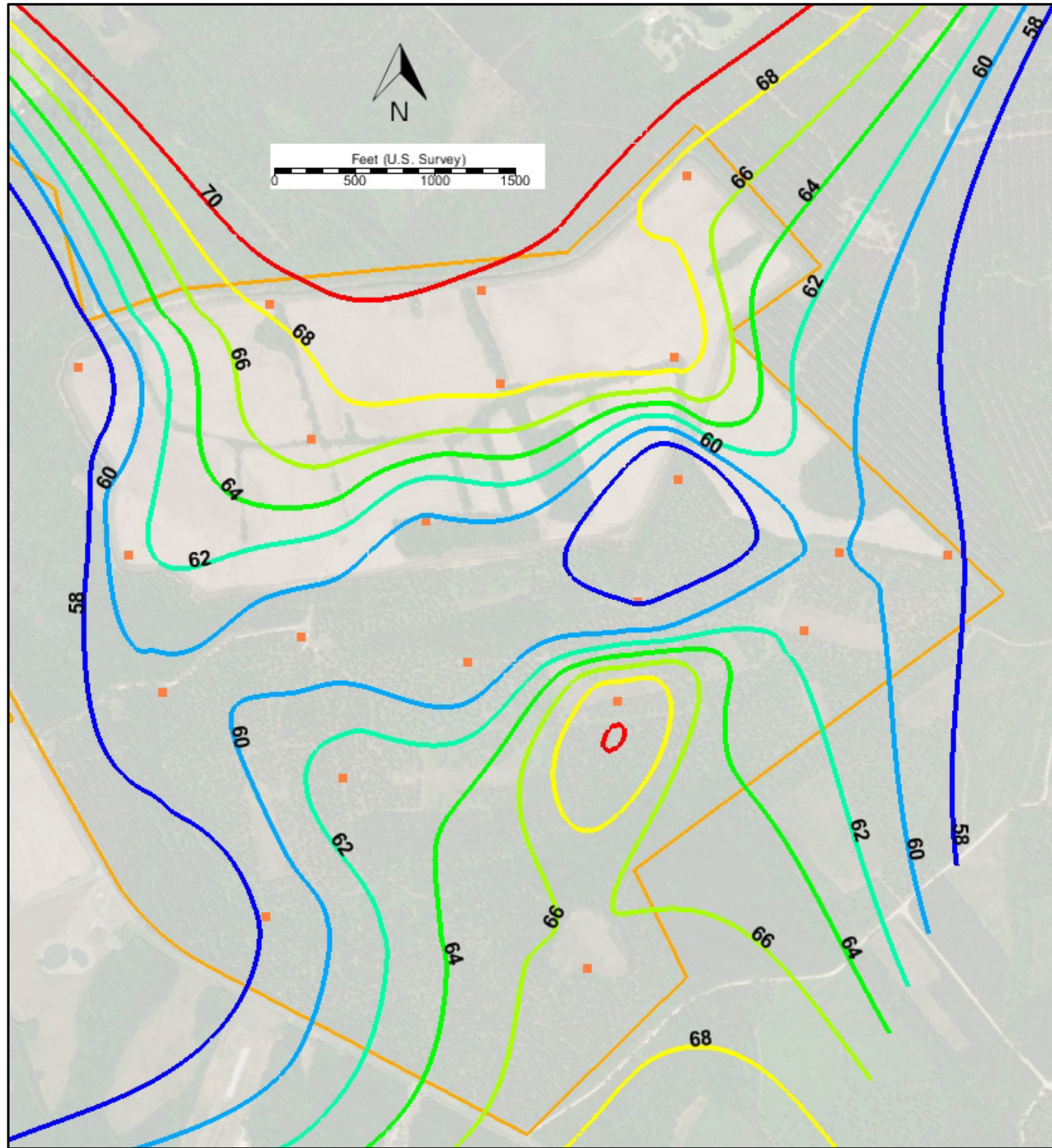
AUGUST 2022 SUBSURFACE
INVESTIGATION LOCATIONS

PREPARED BY:
GZA GeoEnvironmental, Inc.
 Engineers and Scientists
 www.gza.com

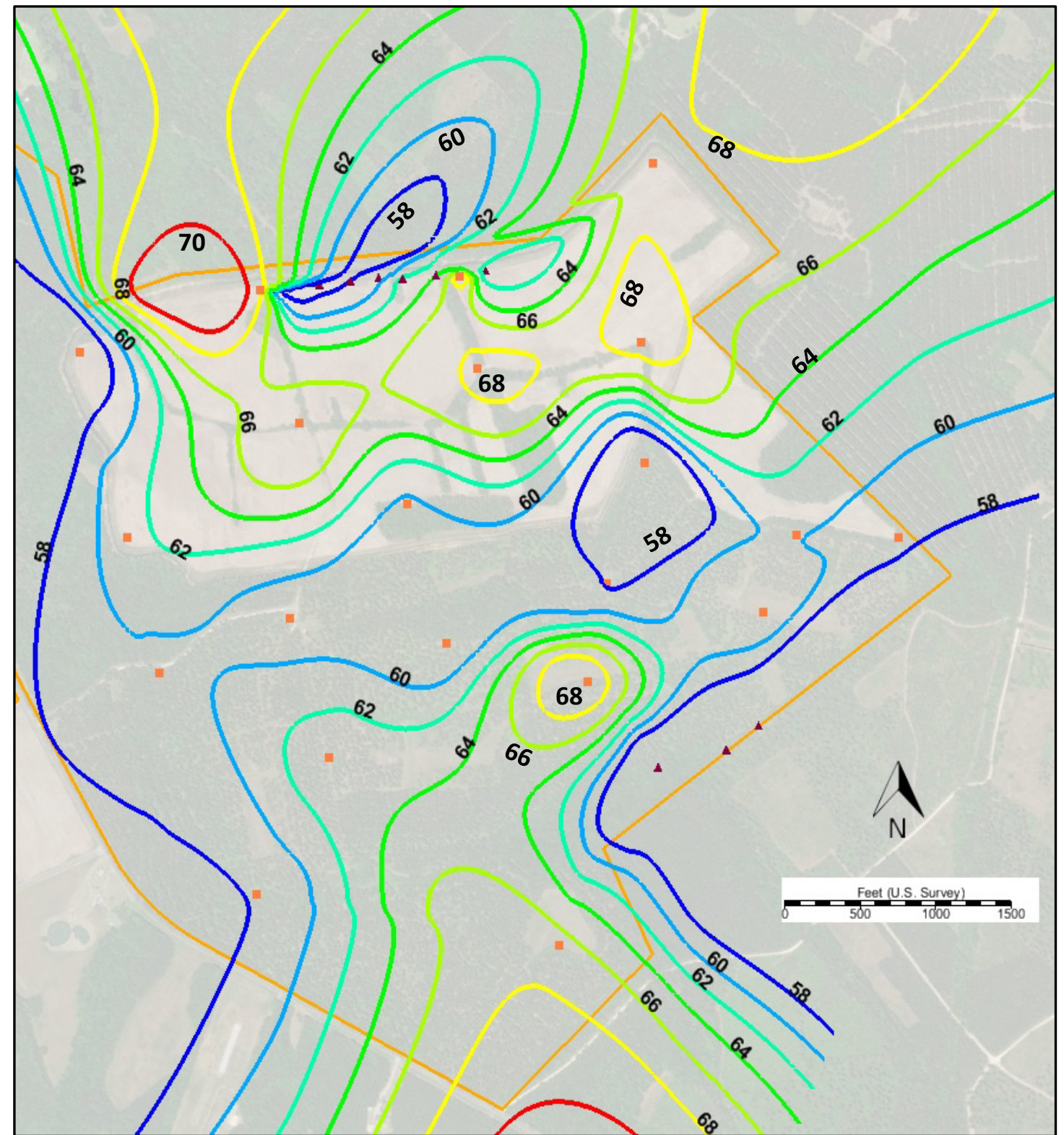
PREPARED FOR:
VULCAN MATERIALS COMPANY

PROJ MGR: MJK	REVIEWED BY: MJK	CHECKED BY: BF	1
DESIGNED BY: JAS	DRAWN BY: JAS	SCALE: N/A	
DATE: 09-12-2022	PROPOSAL NO. 20.0157528.00	REVISION NO.	





PREVIOUS EXTRAPOLATED BEDROCK SURFACE MAP



BEDROCK SURFACE MAP (INCLUDES AUG 2022 DATA)



LEGEND

-  PROPERTY BOUNDARY
-  58
BEDROCK SURFACE ELEVATION (MULTI-COLORED)
-  PRIOR COREHOLE
-  SOIL BORING

VULCAN ORANGEBURG QUARRY ORANGEBURG COUNTY, SOUTH CAROLINA

BEDROCK SURFACE ELEVATION MAPS

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PREPARED BY:
 **GZA** GeoEnvironmental, Inc.
 Engineers and Scientists
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PREPARED FOR:
VULCAN MATERIALS COMPANY

PROJ MGR: MJK	REVIEWED BY: MJK	CHECKED BY: BF	FIGURE 2
DESIGNED BY: JAS	DRAWN BY: JAS	SCALE: N/A	
DATE: 09-12-2022	PROPOSAL NO. 20.0157528.00	REVISION NO.	



ATTACHMENTS



ATTACHMENT 1

Limitations



LIMITATIONS

1. The conclusions presented in this memorandum are based upon the hydrogeologic and physical data obtained from specific sampling, testing, and gauging locations at specific times. The full nature and extent of variations in the data between these specific locations and times are not known. The conditions existing between these specific locations and times have only been inferred using interpolation and extrapolation based on judgment.
2. The subsurface profiles described in the memorandum are intended to convey anticipated trends in subsurface conditions. The conditions modeled are approximate and generalized and were developed, in part, based on judgment and professional interpretation. For specific information at specific locations, refer to the individual boring investigation logs.
3. Water level readings (piezometric pressures) have been made in the specific monitoring points at times and under conditions stated. These data have been reviewed and interpretations have been made in the text and on the figures of this memorandum. However, it must be noted that temporal and spatial fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time and location measurements were made.
4. Actual subsurface conditions are likely more complex than indicated in this memorandum. Our mathematical model is, by its very nature, a simplification of actual conditions. Except as noted in the memorandum, we did not validate the code used in the model. In constructing the model, point-specific data were generalized and extrapolated across the study area. In addition, in areas where field data were not available, we used professional judgment, based on experience and regional information, to construct the model. Model assumptions are provided within the memorandum. Actual flow patterns and/or groundwater discharges may be other than simulated. As additional field data becomes available our numerical model can be modified to better reflect conditions of possible interest.
5. Variations in the flow paths may occur due to seasonal water table fluctuations, past and current operational practices (i.e., groundwater extraction), climate change, the passage of time, and other factors. Should additional data (water analyses, water elevations, subsurface deposits, construction and operation, etc.) become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented herein modified accordingly.
6. Our results are based on the work conducted as part of the subsurface investigation presented in the memorandum and reflect our professional judgment. These results must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data provided during the course of our work. Conditions other than described in this memorandum may be found at the subject location(s).
7. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.



ATTACHMENT 2

Soil Boring Logs



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-1

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557665.5; E: 2216515.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NW portion of northern drilling area

Release System: NA

GS Elevation: 85.5'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture <i>(ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)</i>
0-5	1	P	60/60	NA	NA	NA	13" - TOPSOIL 13" - Soft, gray, SILTY CLAY, trace sand, moist 24" - Medium dense, red-brown, CLAYEY SILT, moist 10" - Stiff, gray, SILTY CLAY, trace sand, moist
5-10	2	P	51/60	NA	NA	NA	30" - SAA 12" - Medium dense, gray, FINE SAND, some silt, trace clay, moist 9" - Medium dense, gray, FINE SAND, some silt, trace clay, wet
10-15	3	P	28/60	NA	NA	NA	28" - SAA
15-20	4	P	50/60	NA	NA	NA	12" - SAA 38" - Medium dense, gray, FINE SAND, some silt, trace clay, trace fine gravel, wet

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-4 installed ~10' east of boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-1

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557665.5; E: 2216515.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NW portion of northern drilling area

Release System: NA

GS Elevation: 85.5'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
20-25	5	P	51/60	NA	NA	NA	51" - Dense, gray, FINE SAND, some silt, trace clay, trace fine gravel, wet
25-27.3	6	P	21/21	NA	NA	NA	18" - SAA 3" - Very dense, gray, FINE GRAVEL, trace fine sand, wet
TOP OF BEDROCK AT 27.3'							

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-4 installed ~10' east of boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-2

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557692.0; E: 2216798.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NW corner of site

Release System: NA

GS Elevation: 86.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Color, Other Comments, Moisture (ex : Dense, well graded SAND (SW), fine to medium; trace Gravel, fine; brown, concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	51/60	NA	NA	NA	12" - TOPSOIL 27" - Loose, red-brown, CLAYEY SILT, moist 12" - Soft, gray, SILTY CLAY, trace fine sand, moist
5-10	2	P	32/60	NA	NA	NA	29" -Soft, brown/gray mottled, CLAY and SILT, trace fine sand, moist 3" - SAA, wet
10-15	3	P	60/60	NA	NA	NA	27" - Medium dense, brown, FINE SAND, with silt, trace clay, wet 33" - Medium dense, gray, SILT, little fine sand, trace clay, trace fine gravel, wet
15-20	4	P	6/60	NA	NA	NA	6" - SAA Poor Recovery. Most of sample poured out of sleeve.

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-2

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557692.0; E: 2216798.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NW corner of site

Release System: NA

GS Elevation: 86.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION		
							Relative Density/Consistency, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Color, Other Comments, Moisture (ex: Dense, well graded SAND (SW), fine to medium; trace Gravel, fine; brown, concrete fragments, 1" Silt layer at 12', wet)		
20-25	5	P	60/60	NA	NA	NA	60" - Medium dense, gray, SILT, little fine sand, trace clay, trace fine gravel, wet		
25-28.5	6	P	42/42	NA	NA	NA	38" - SAA 4" - Very dense, gray, FINE GRAVEL, trace fine to medium sand, wet		
							TOP OF BEDROCK AT 28.5'		
GRANULAR SOILS Blows / Ft-Density		COHESIVE SOILS P.P.(tsf)-Consistency		TYPE OF SAMPLE		MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION	
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense		<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard		SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl		1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand	

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-3

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557714.5; E: 2217008.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 86.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Color, Other Comments, Moisture (ex: Dense, well graded SAND (SW), fine to medium; trace Gravel, fine; brown, concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	60/60	NA	NA	NA	18" - TOPSOIL 32" - Loose, red-brown, CLAYEY SILT, trace fine sand, moist 10" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist
5-10	2	P	23/60	NA	NA	NA	17" - Medium dense, gray, CLAYEY SILT, little fine sand, trace fine gravel, moist 6" - SAA, wet Low recovery because drillers forgot to put sleeve in core.
10-15	3	P	30/60	NA	NA	NA	30" - Medium dense, gray, CLAYEY SILT, little fine sand, trace fine gravel, wet
15-20	4	P	60/60	NA	NA	NA	60" - SAA

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-5 installed at boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-3

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557714.5; E: 2217008.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 86.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION				
							Relative Density/Consistency, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Color, Other Comments, Moisture (ex: Dense, well graded SAND (SW), fine to medium; trace Gravel, fine; brown, concrete fragments, 1" Silt layer at 12', wet)				
20-25	5	P	60/60	NA	NA	NA	60" - Medium dense, gray, CLAYEY SILT, little fine sand, trace fine gravel, wet				
25-28.3	6	P	39/39	NA	NA	NA	35" - SAA 4" - Very dense, gray, FINE GRAVEL, trace fine to medium sand, wet				
TOP OF BEDROCK AT 28.3'											
GRANULAR SOILS Blows / Ft-Density			COHESIVE SOILS P.P.(tsf)-Consistency		TYPE OF SAMPLE		MINOR COMPONENTS		MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION	
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense			<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard		SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl		1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)		DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand	

NOTES:

Top of bedrock was determined by direct push refusal.

MW-5 installed at boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-4

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557734.0; E: 2217193.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 87.0'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	60/60	NA	NA	NA	11" - TOPSOIL 13" - Loose, red-brown, CLAYEY SILT, little fine sand, moist 36" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist
5-10	2	P	25/60	NA	NA	NA	19" - SAA 6" - Medium dense, brown, CLAYEY SILT, trace fine sand, wet
10-15	3	P	60/60	NA	NA	NA	21" - SAA 39" - Dense, gray, CLAYEY SILT, some fine sand, trace fine gravel, wet
15-20	4	P	60/60	NA	NA	NA	60" - SAA

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed at this location.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-4

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557734.0; E: 2217193.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 87.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION		
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)		
20-25	5	P	60/60	NA	NA	NA	60" - Dense, gray, CLAYEY SILT, some fine sand, trace fine gravel, wet		
25-27.5	6	P	30/30	NA	NA	NA	30" - SAA		
							TOP OF BEDROCK AT 27.5'		
GRANULAR SOILS Blows / Ft-Density		COHESIVE SOILS P.P.(tsf)-Consistency		TYPE OF SAMPLE		MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION	
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense		<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard		SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl		1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand	

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed at this location.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-5

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557728.5; E: 2217353.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 87.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	29/60	NA	NA	NA	18" - TOPSOIL, with fine sand 11" - Medium stiff, gray, SILTY CLAY, trace fine sand, moist
5-10	2	P	36/60	NA	NA	NA	11" - SAA 21" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist 4" - SAA, wet
10-15	3	P	0/60	NA	NA	NA	NO RECOVERY
15-20	4	P	60/60	NA	NA	NA	60" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed at this location.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-5

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557728.5; E: 2217353.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: North center of site

Release System: NA

GS Elevation: 87.0'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION		
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)		
20-24.4	5	P	53/53	NA	NA	NA	10" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist 43" - Very dense, gray, CLAYEY SILT, trace fine sand, trace fine gravel, wet		
TOP OF BEDROCK AT 24.4'									
GRANULAR SOILS Blows / Ft-Density		COHESIVE SOILS P.P.(tsf)-Consistency		TYPE OF SAMPLE		MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION	
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense		<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard		SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl		1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand	

NOTES:

Top of bedrock was determined by direct push refusal.

No well installed at this location.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-6

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557748.0; E: 2217574.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NE portion of site

Release System: NA

GS Elevation: 87.5'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture <i>(ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)</i>
0-5	1	P	60/60	NA	NA	NA	13" - TOPSOIL 28" - Medium dense, gray to brown, CLAYEY SILT, some fine sand, moist 19" - Medium dense, gray, SILT AND CLAY, trace fine sand, moist
5-10	2	P	28/60	NA	NA	NA	28" - Medium dense, brown, FINE SAND, some silt, trace clay, moist
10-15	3	P	60/60	NA	NA	NA	13" - SAA 12" - Medium dense, brown, FINE SAND, some silt, trace clay, wet 35" - Dense, gray, FINE SAND, little silt, trace clay, trace fine gravel, wet
15-20	4	P	60/60	NA	NA	NA	60" - SAA

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-6 installed ~80' west of boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-6

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557748.0; E: 2217574.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NE portion of site

Release System: NA

GS Elevation: 87.5'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION	
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)	
20-23.2	5	P	38/38	NA	NA	NA	38" - Dense, gray, FINE SAND, little silt, trace clay, trace fine gravel, wet	
							TOP OF BEDROCK AT 23.2'	

NOTES:

Top of bedrock was determined by direct push refusal.

MW-6 installed ~80' west of boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-7

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 557778.5; E: 2217904.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NE corner of site

Release System: NA

GS Elevation: 87.5'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	60/60	NA	NA	NA	9" - TOPSOIL 51" - Soft, gray, SILTY CLAY, trace fine sand, moist
5-10	2	P	41/60	NA	NA	NA	12" - SAA 9" - Medium dense, gray, FINE SAND, little silt, trace clay, moist 20" - Medium dense, gray, FINE to MEDIUM SAND, trace silt, trace clay, wet
10-15	3	P	50/60	NA	NA	NA	3" - SAA 9" - Dense, brown, CLAYEY SILT, little fine to medium sand, wet 38" - Dense, gray, CLAYEY SILT, little fine to medium sand, wet
15-20	4	P	51/60	NA	NA	NA	51" - Dense, gray, CLAYEY SILT, little fine to medium sand, trace gravel, wet

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-7 installed at boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: North-7

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 557778.5; E: 2217904.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/15/2022

Hammer Wt./Fall: NA

/

Boring Location: NE corner of site

Release System: NA

GS Elevation: 87.5'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
20-25	5	P	31/60	NA	NA	NA	31" - Dense, gray, CLAYEY SILT, little fine to medium sand, trace gravel, wet
25-25.7	6	P	8/8	NA	NA	NA	3" - SAA 5" - Very dense, gray, FINE GRAVEL, little fine to medium sand, trace silt, trace clay, wet
TOP OF BEDROCK AT 25.7'							

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:

Top of bedrock was determined by direct push refusal.

MW-7 installed at boring.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-1

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 554898.0; E: 2219714.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: SE corner of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture <i>(ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)</i>
0-5	1	P	44/60	NA	NA	NA	6" - TOPSOIL 38" - Loose, red-brown, CLAYEY SILT, little fine sand, moist
5-10	2	P	60/60	NA	NA	NA	9" - SAA 30" - Medium dense, gray, SILT AND CLAY, trace fine sand, moist 21" - Medium dense, gray, CLAYEY SILT, trace fine sand, moist
10-15	3	P	14/60	NA	NA	NA	14" - Medium dense, yellow-gray, CLAYEY SILT, little sand, wet
15-20	4	P	60/60	NA	NA	NA	21" - SAA 39" - Dense, gray, FINE SAND, some, silt, trace clay, wet

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:
Top of bedrock was determined by direct push refusal.

MW-10 installed at boring.

Drillers said no recovery could be due to wet sand.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-1

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 554898.0; E: 2219714.0 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: SE corner of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
20-25	5	P	0/60	NA	NA	NA	NO RECOVERY
25-30	6	P	60/60	NA	NA	NA	60" - Dense, gray, SANDY SILT, trace clay, wet
30-34.5	7	P	54/54	NA	NA	NA	51" - SAA 3" - Very dense, gray, GRAVEL, trace fine sand, wet
							TOP OF BEDROCK AT 34.5'

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:
 Top of bedrock was determined by direct push refusal.
 MW-10 installed at boring.
 Drillers said no recovery could be due to wet sand.
 Elevation estimated from LiDAR data due to GPS inaccuracies.
 SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-2

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 554748.0; E: 2219498.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: South center of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture <i>(ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)</i>
0-5	1	P	30/60	NA	NA	NA	7" - TOPSOIL 12" - Loose, brown, CLAYEY SILT, trace fine sand, moist 11" - Medium dense, red-brown, SILT AND CLAY, trace fine sand, moist
5-10	2	P	48/60	NA	NA	NA	10" - Stiff, red-brown, CLAY AND SILT, trace fine sand, moist 25" - Stiff, gray, SILTY CLAY, trace fine sand, moist 13" - Medium dense, gray, SILT AND CLAY, trace fine sand, moist
10-15	3	P	30/60	NA	NA	NA	6" - SAA 24" - Dense, gray, SANDY SILT, trace clay, wet
15-20	4	P	38/60	NA	NA	NA	38" - SAA

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:
Top of bedrock was determined by direct push refusal.

MW-9 installed at boring.

Drillers said no recovery could be due to wet sand.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-2

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 554748.0; E: 2219498.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: South center of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION		
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)		
20-25	5	P	0/60	NA	NA	NA	NO RECOVERY		
25-30	6	P	60/60	NA	NA	NA	60" - Dense, gray, SANDY SILT, trace clay, wet		
30-33.8	7	P	45/45	NA	NA	NA	42" - SAA 3" - Very dense, gray, GRAVEL, trace fine sand, wet		
							TOP OF BEDROCK AT 33.8'		
GRANULAR SOILS Blows / Ft-Density		COHESIVE SOILS P.P.(tsf)-Consistency		TYPE OF SAMPLE		MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION	
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense		<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard		SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl		1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand	

NOTES:
Top of bedrock was determined by direct push refusal.

MW-9 installed at boring.

Drillers said no recovery could be due to wet sand.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-3

Location: Orangeburg County, South Carolina

Page: 1 of 2

Coordinates: N: 554633.5; E: 2219048.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: SW corner of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
0-5	1	P	51/60	NA	NA	NA	10" - TOPSOIL 11" - Loose, brown, CLAYEY SILT, trace fine sand, moist 30" - Medium dense, red-brown, SILT AND CLAY, trace fine sand, moist
5-10	2	P	30/60	NA	NA	NA	9" - SAA 21" - Medium dense, gray, SILT AND CLAY, little fine sand, moist
10-15	3	P	56/60	NA	NA	NA	15" - Medium dense, gray, SILT AND CLAY, little fine sand, wet 41" - Dense, gray, SANDY SILT, trace clay, wet
15-20	4	P	60/60	NA	NA	NA	60" - Dense, gray, SANDY SILT, trace clay, trace fine gravel, wet

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:
Top of bedrock was determined by direct push refusal.

MW-8 installed at boring.

Drillers said no recovery could be due to wet sand.

Elevation estimated from LiDAR data due to GPS inaccuracies.

SAA = same as above



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Client Name: Vulcan Materials Company

Boring No.: South-3

Location: Orangeburg County, South Carolina

Page: 2 of 2

Coordinates: N: 554633.5; E: 2219048.5 (South Carolina State Plane (feet))

File No.: 20.0157528.00

Checked By: JAS

Contractor: Elite Techniques

Auger / Casing

Sampler

Foreman: Dearal Rodgers

Type: Direct Push

Sleeve

Rig: GeoProbe 7822 DT

O.D. / I.D.: 2.25"

1.75"

Logged By: Chad Martin

Hammer Type: NA

Date Start/Finish: 08/17/2022

Hammer Wt./Fall: NA

/

Boring Location: SW corner of site

Release System: NA

GS Elevation: 88.0'

Datum: NAVD 88

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
Not Measured				

Surveyed By: LiDAR Data

Survey Date:

DEPTH (feet)	No.	Type	Pen./ Rec (inch)	Blows (/6")	Field Test Data (ppm)	Pocket Pen Readings (tsf)	SAMPLE DESCRIPTION AND CLASSIFICATION
							Relative Density/Consistency, Color, Group Name (Modified Burmister), Group Descriptors; Constituents, Constituent Descriptors; Other Comments, Moisture (ex : Dense, brown, fine to medium SAND ; trace Gravel, fine; concrete fragments, 1" Silt layer at 12', wet)
20-25	5	P	60/60	NA	NA	NA	60" - Dense, gray, SANDY SILT, trace clay, trace fine gravel, wet
25-30	6	P	0/60	NA	NA	NA	NO RECOVERY
30-33.5	7	P	42/42	NA	NA	NA	39" - Dense, gray, SANDY SILT, trace clay, trace fine gravel, wet 3" - Very dense, gray, GRAVEL, trace fine sand, wet
							TOP OF BEDROCK AT 33.5'

GRANULAR SOILS Blows / Ft-Density	COHESIVE SOILS P.P.(tsf)-Consistency	TYPE OF SAMPLE	MINOR COMPONENTS	MOISTURE	UNIFIED SOIL CLASSIFICATION SYMBOL AND DESCRIPTION
0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	<0.25 - V. Soft 0.25 - 0.5 - Soft 0.5 - 1 - M. Stiff 1 - 2 - Stiff 2 - 4 - V. Stiff >4 - Hard	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag BL - Block P - Geoprobe HYP - Hydropunch HA - Hand Auger 0 - Other/Expl	1 - 5% TRACE 5 - 15% LITTLE 15 - 30% SOME 30 - 50% WITH (Or Use Adjective >25%)	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/Silt-Low Plast CH - Fat Clay MH - Elastic Silt OH - Organic Clay/Silt-High Plast PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

NOTES:
 Top of bedrock was determined by direct push refusal.
 MW-8 installed at boring.
 Drillers said no recovery could be due to wet sand.
 Elevation estimated from LiDAR data due to GPS inaccuracies.
 SAA = same as above



ATTACHMENT 3

Monitoring Well Installation Logs

MONITORING WELL INSTALLATION REPORT

WELL # MW-6

GZA GeoEnvironmental, Inc. Engineers and Scientists 17975 W. Sarah Ln. Suite 100, Brookfield, WI 53045	Project: Subsurface Investigation Location: Vulcan Orangeburg Quarry Orangeburg County, SC	Project No. 20.0157528.00 Date: August 16, 2022
GZA Field Rep: Chad Martin Drilling Contractor: Elite Techniques Driller: Dearyl Rodgers	Horiz. Datum: NAD 1983 Northing: 557741.0 Easting: 2217494.0 Date Surveyed: August 18, 2022 Surveyed By: GZA GPS	Elev. Datum: NAVD 88 Ground Elev: 87.5 Top of Well Elev: 90.8 GS Surveyed By: LiDAR data

MONITORING WELL DETAILS

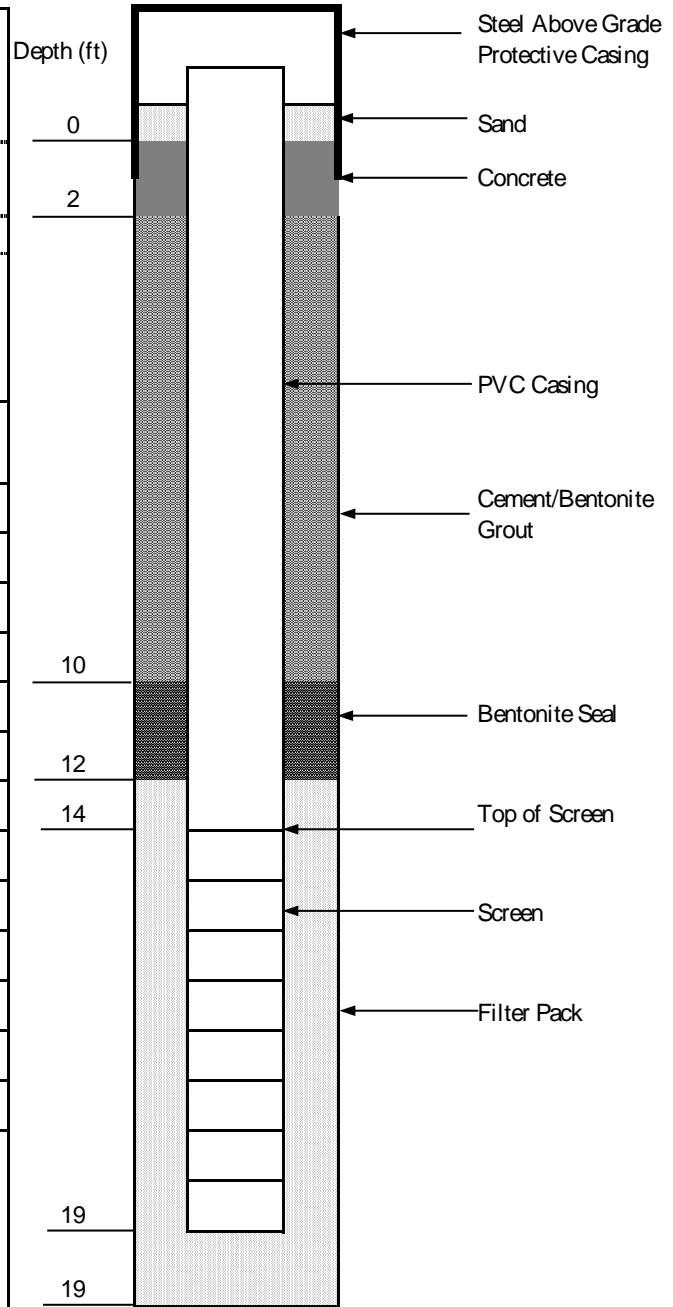
Wellscreen Dia: 2-inch	Type: Sch. 40 PVC
Slot Size: 0.010-inch	Length: 5 feet
Well Riser Dia: 2-inch	Type: Sch. 40 PVC
Pipe Connections: Flush-threaded	Length: 10 feet
Filter and Sand Type: Badger Mining 65-75	
Protective Casing: YES	Pad: Concrete
Locked Cap: YES	Pad Size: 2' x 2'
Casing Dia: 4-inch	
Length: 5 feet	

GROUNDWATER MEASUREMENT DATA

Date	Time	Depth ¹	Method	Elev.
8/19/2022	1050	8.35	Elec. WL	82.5
8/19/2022	1145	8.35	Elec. WL	82.5

REMARKS: 1. Groundwater depth measurement made from top of well casing.

See borehole North-6 for soil descriptions.



MONITOR WELL DRAWING NOT TO SCALE.

MONITORING WELL INSTALLATION REPORT

WELL # MW-10

GZA GeoEnvironmental, Inc. Engineers and Scientists 17975 W. Sarah Ln. Suite 100, Brookfield, WI 53045	Project: Subsurface Investigation Location: Vulcan Orangeburg Quarry Orangeburg County, SC	Project No. 20.0157528.00 Date: August 18, 2022
GZA Field Rep: Chad Martin Drilling Contractor: Elite Techniques Driller: Dearyl Rodgers	Horiz. Datum: NAD 1983 Northing: 554898.0 Easting: 2219710.0 Date Surveyed: August 18, 2022 Surveyed By: GZA GPS	Elev. Datum: NAVD 88 Ground Elev: 86.5 Top of Well Elev: 89.8 GS Surveyed By: LiDAR data

MONITORING WELL DETAILS

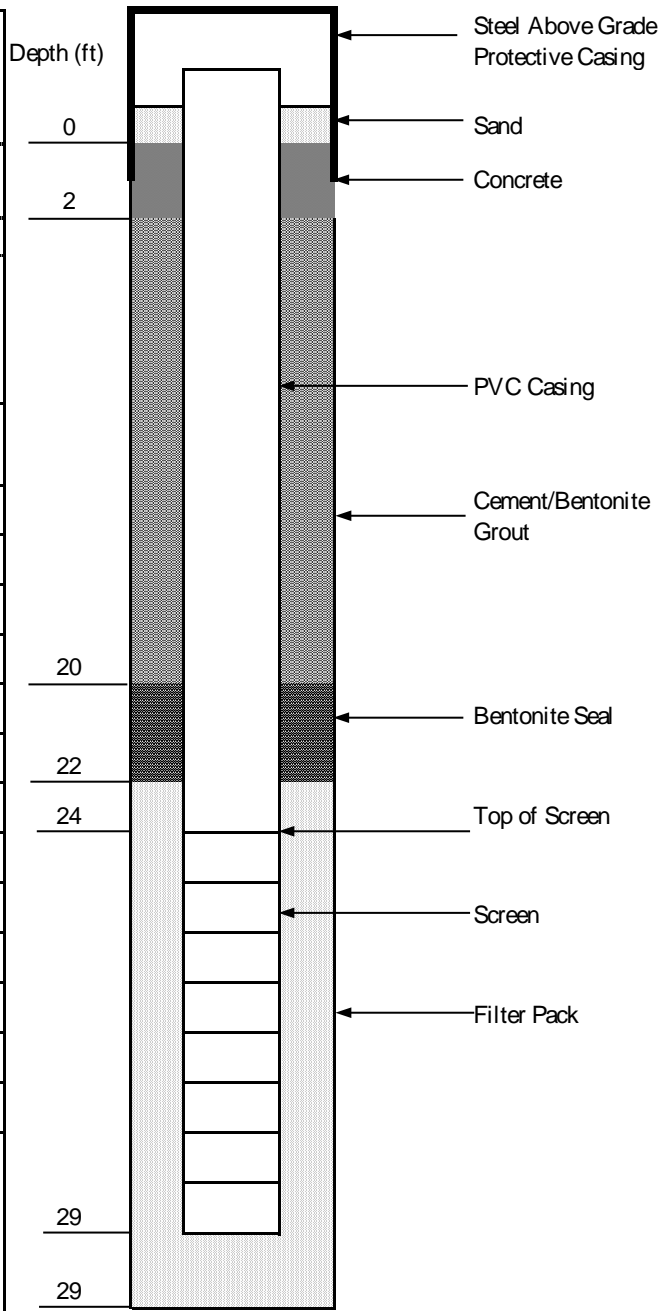
Wellscreen Dia: 2-inch	Type: Sch. 40 PVC
Slot Size: 0.010-inch	Length: 5 feet
Well Riser Dia: 2-inch	Type: Sch. 40 PVC
Pipe Connections: Flush-threaded	Length: 10 feet
Filter and Sand Type: Badger Mining 65-75	
Protective Casing: YES	Pad: Concrete
Locked Cap: YES	Pad Size: 2' x 2'
Casing Dia: 4-inch	
Length: 5 feet	

GROUNDWATER MEASUREMENT DATA

Date	Time	Depth ¹	Method	Elev.
8/19/2022	1012	12.91	Elec. WL	76.9
8/19/2022	1425	12.92	Elec. WL	76.9

REMARKS: 1. Groundwater depth measurement made from top of well casing.

See borehole South-3 for soil descriptions.

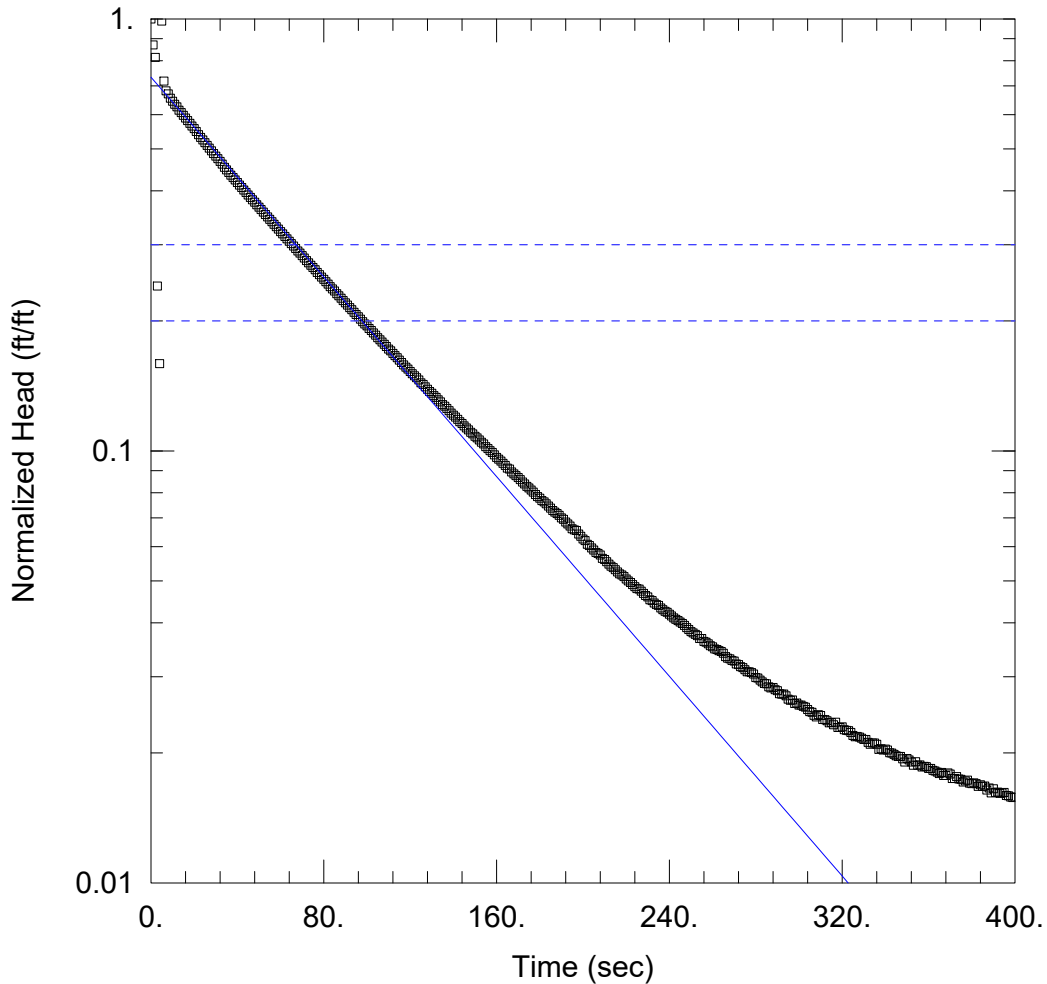


MONITOR WELL DRAWING NOT TO SCALE.



ATTACHMENT 4

AQTESOLV Hydraulic Conductivity Testing Results



ORANGEBURG COUNTY SITE

Data Set: \...\MW-4 - Falling 1.aqt
 Date: 09/01/22

Time: 14:43:10

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-4
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-4)

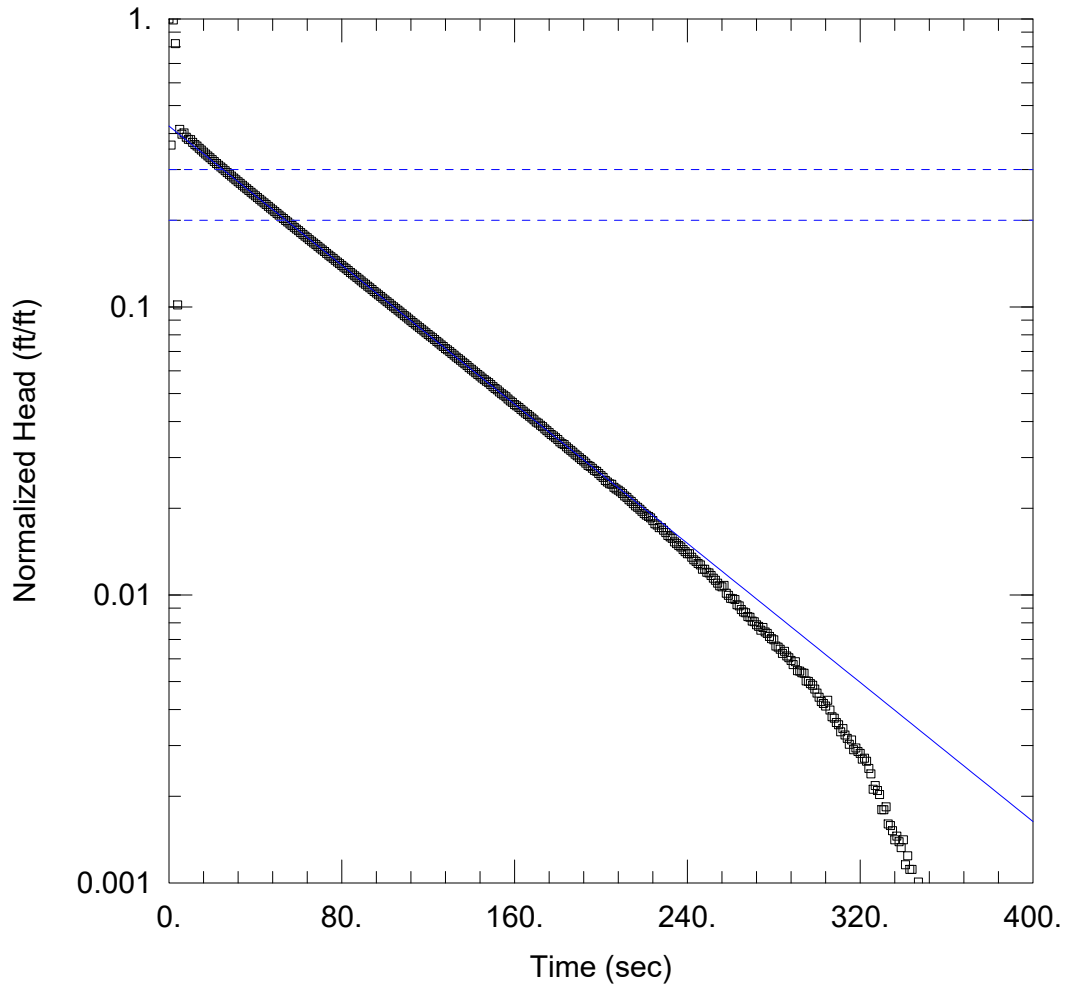
Initial Displacement: 2.8 ft
 Total Well Penetration Depth: 17.7 ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 1.851 ft/day

Solution Method: Bower-Rice
 y0 = 2.053 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-4 - Falling 2.aqt
 Date: 09/01/22

Time: 14:44:09

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-4
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-4)

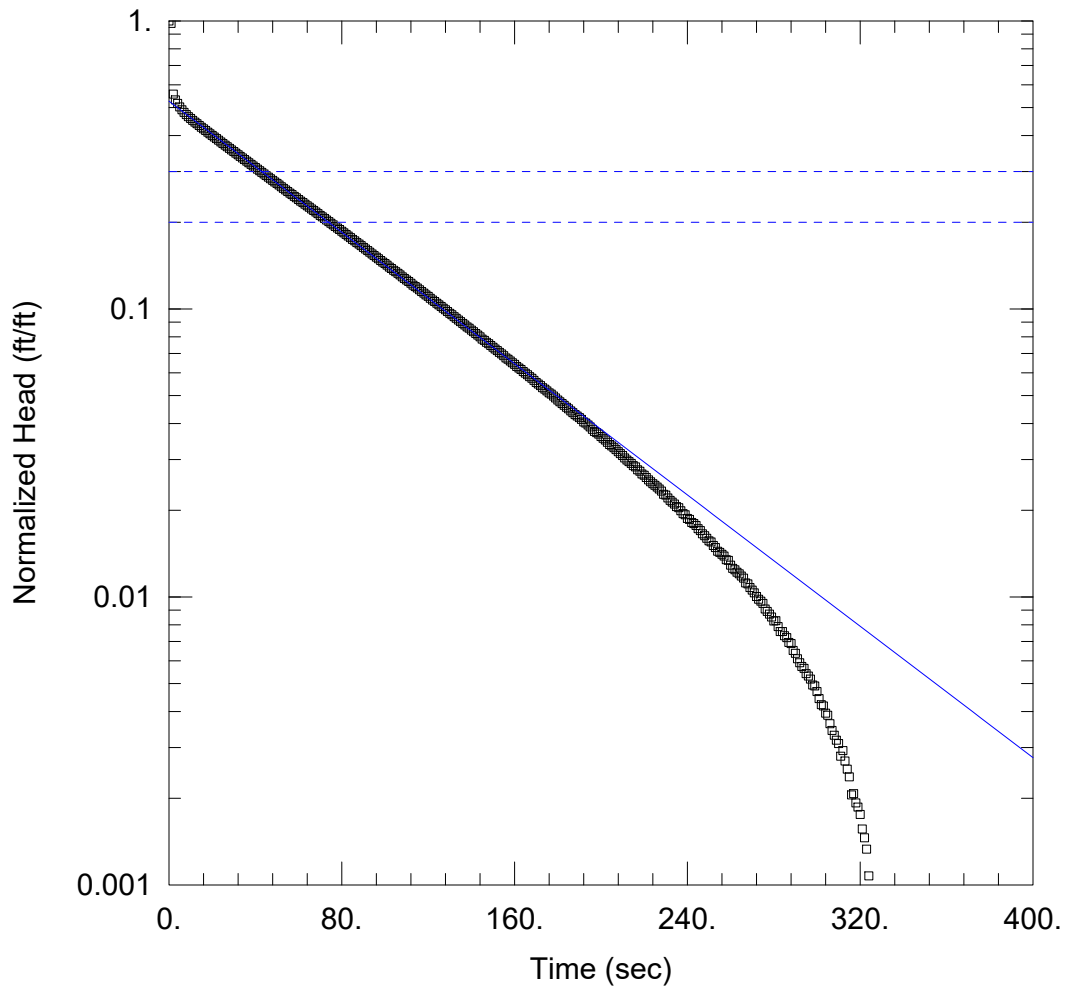
Initial Displacement: 4.7 ft
 Total Well Penetration Depth: 17.7 ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 1.934 ft/day

Solution Method: Bower-Rice
 y0 = 1.995 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-4 - Rising 1.aqt
 Date: 09/01/22

Time: 14:45:04

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-4
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-4)

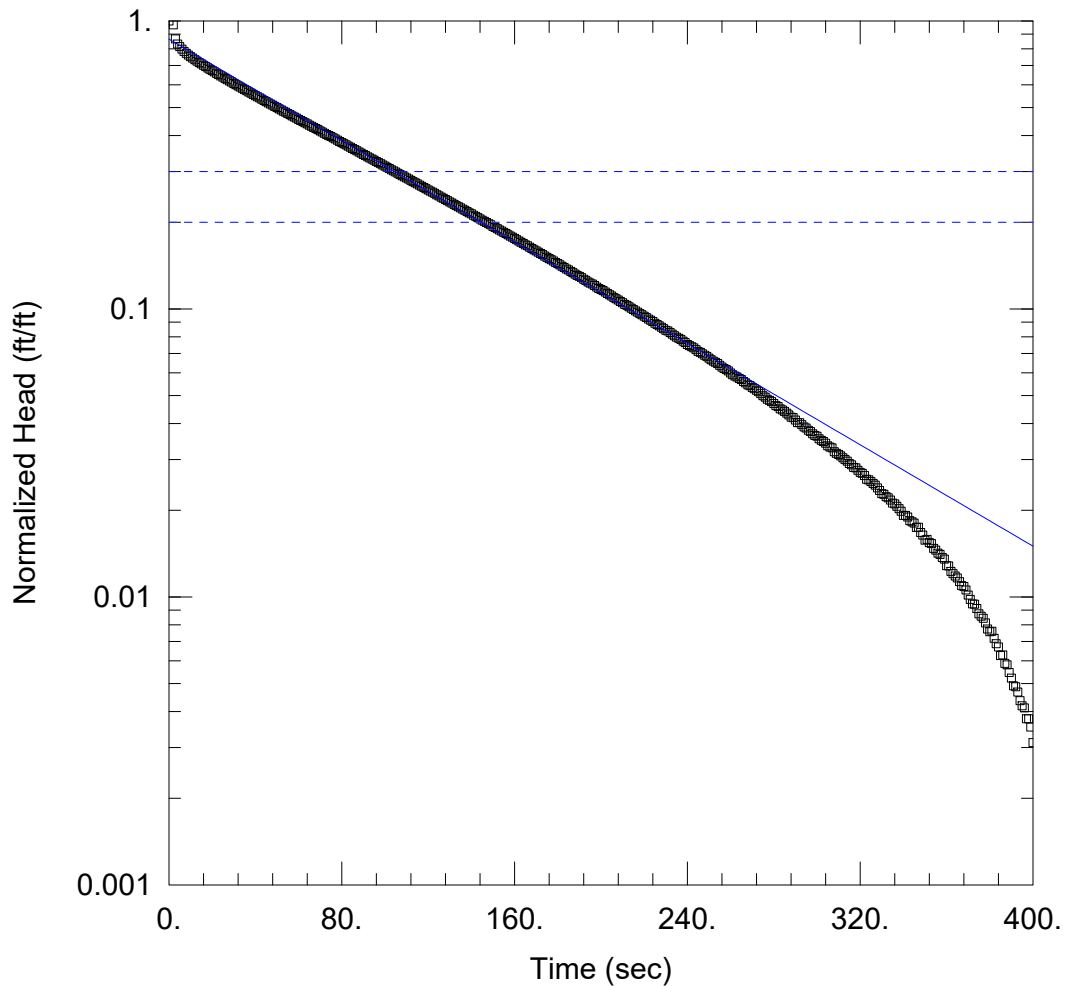
Initial Displacement: 4.7 ft
 Total Well Penetration Depth: 17.7 ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 1.826 ft/day

Solution Method: Bower-Rice
 y0 = 2.476 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-4 - Rising 2.aqt
 Date: 09/01/22

Time: 14:45:53

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-4
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-4)

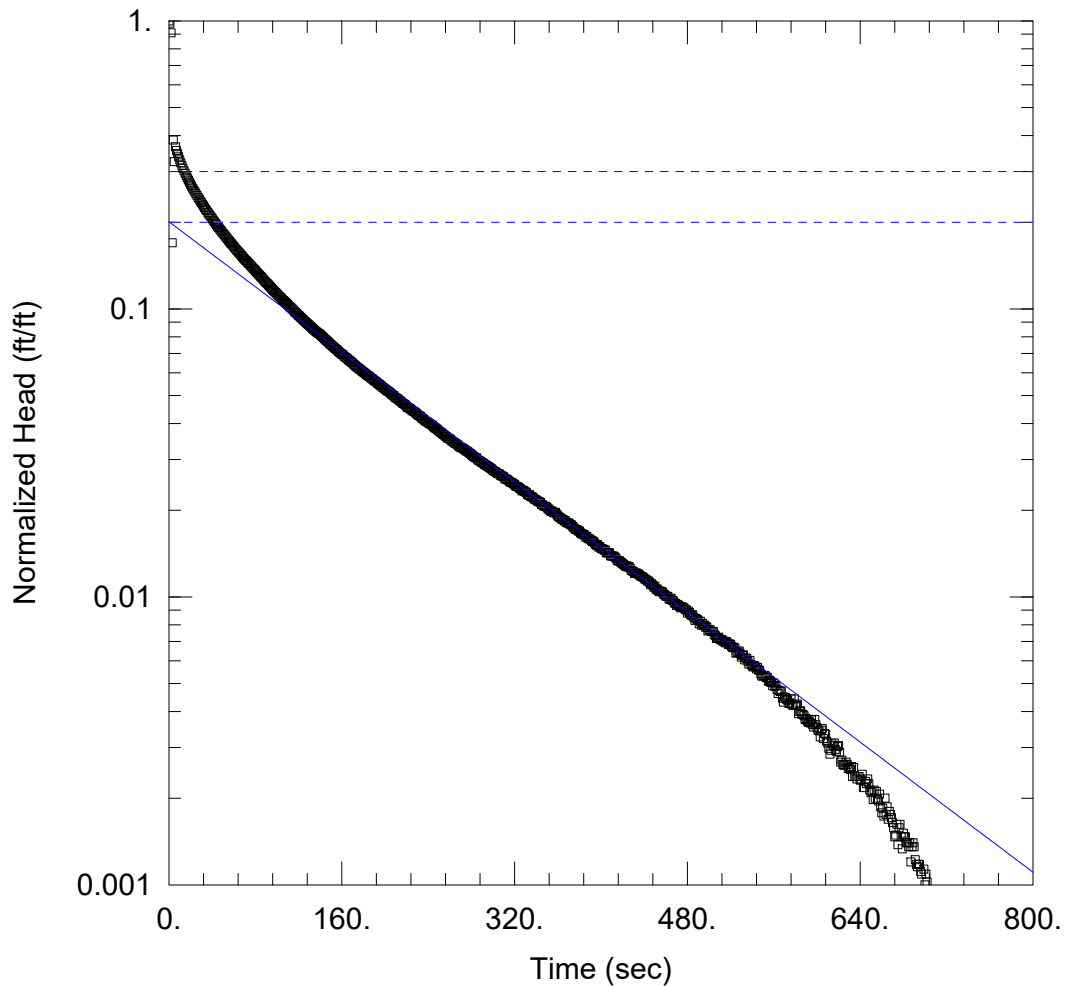
Initial Displacement: 2.9 ft
 Total Well Penetration Depth: 17.7 ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 1.41 ft/day

Solution Method: Bower-Rice
 y0 = 2.507 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-6 - Falling 1 - later time.aqt

Date: 09/01/22

Time: 14:50:17

PROJECT INFORMATION

Company: GZA

Client: Vulcan

Project: 20.0157528.00

Location: Orangeburg County, SC

Test Well: MW-6

Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-6)

Initial Displacement: 4.5 ft

Static Water Column Height: 14. ft

Total Well Penetration Depth: 14. ft

Screen Length: 7. ft

Casing Radius: 0.08333 ft

Well Radius: 0.3438 ft

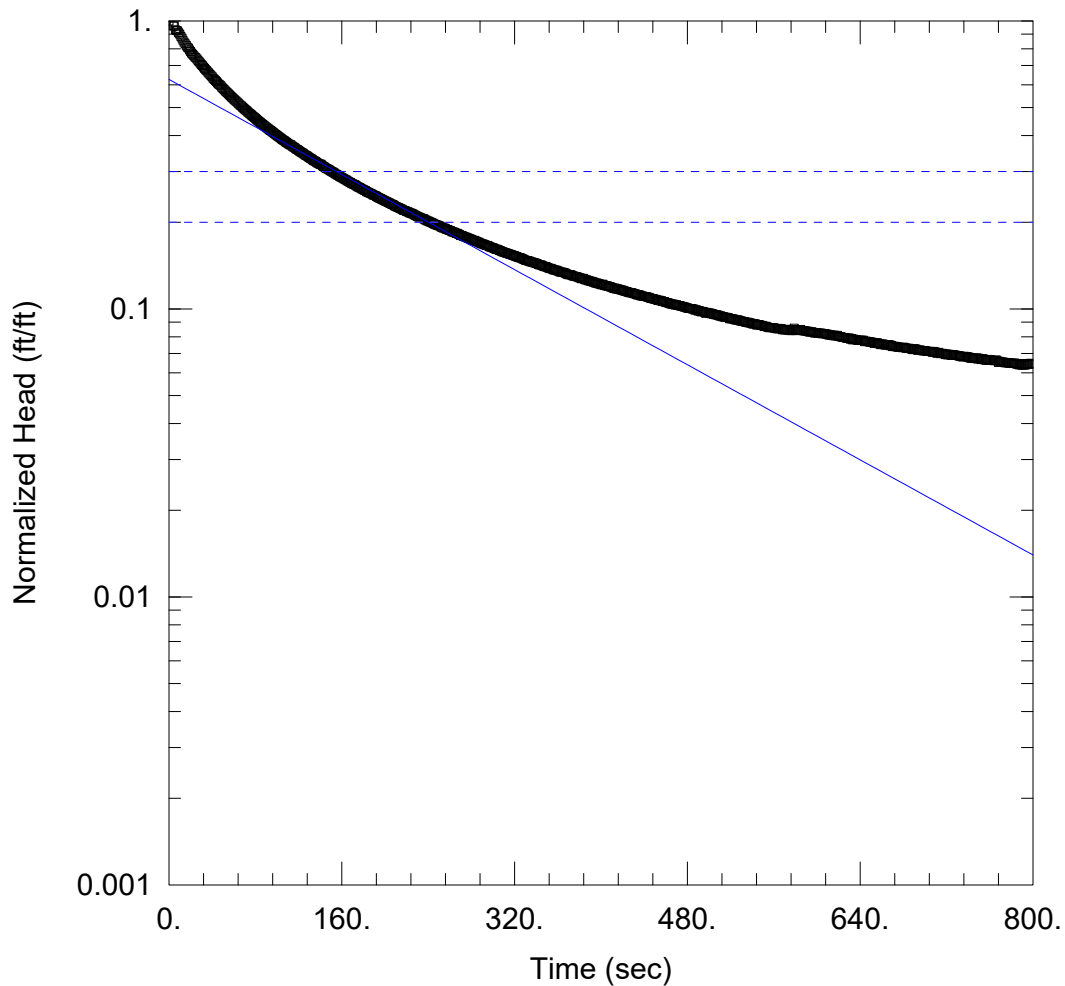
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

K = 0.865 ft/day

y0 = 0.9034 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-6 - Falling 2.aqt
 Date: 09/01/22

Time: 14:47:38

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-6
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-6)

Initial Displacement: 1.5 ft
 Total Well Penetration Depth: 14. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 14. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

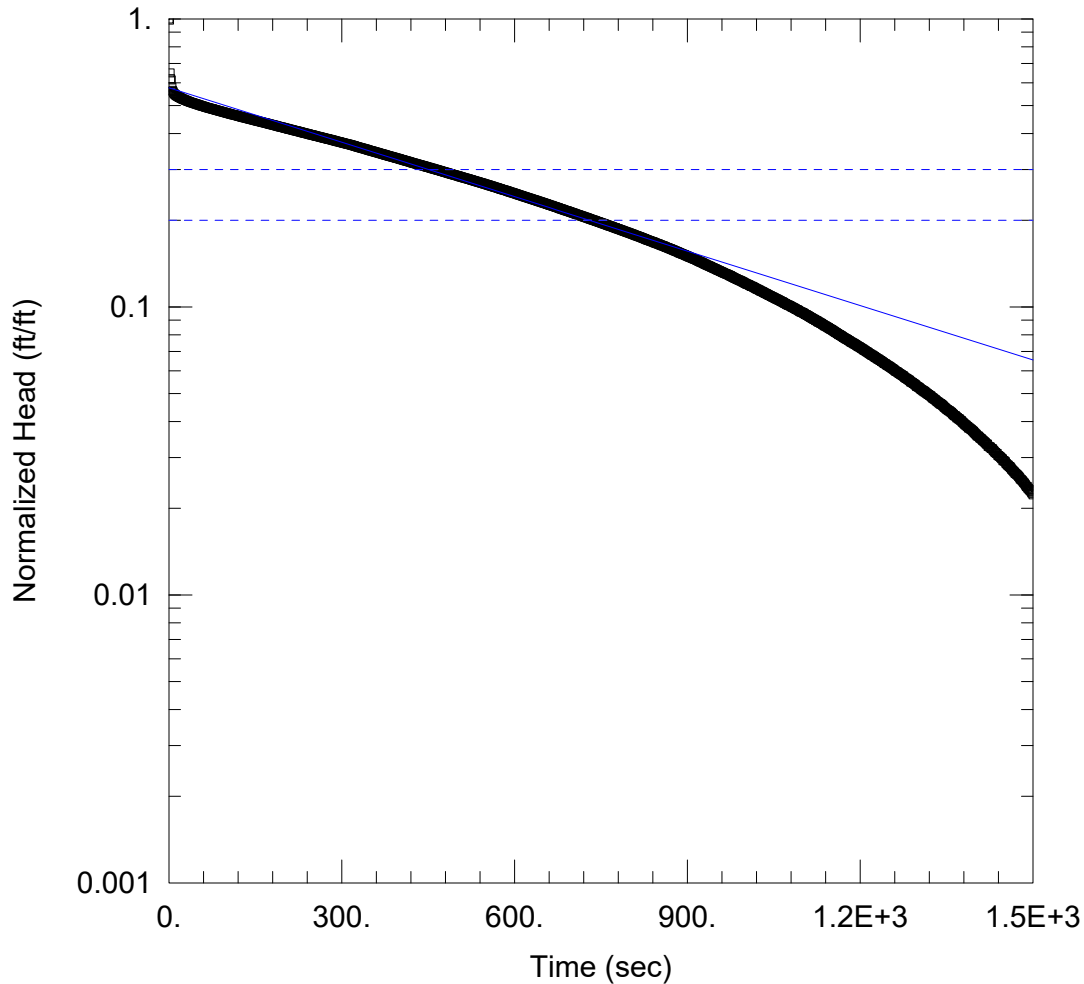
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6323 ft/day

y0 = 0.9396 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-6 - Rising 1.aqt
 Date: 09/01/22

Time: 14:49:07

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-6
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-6)

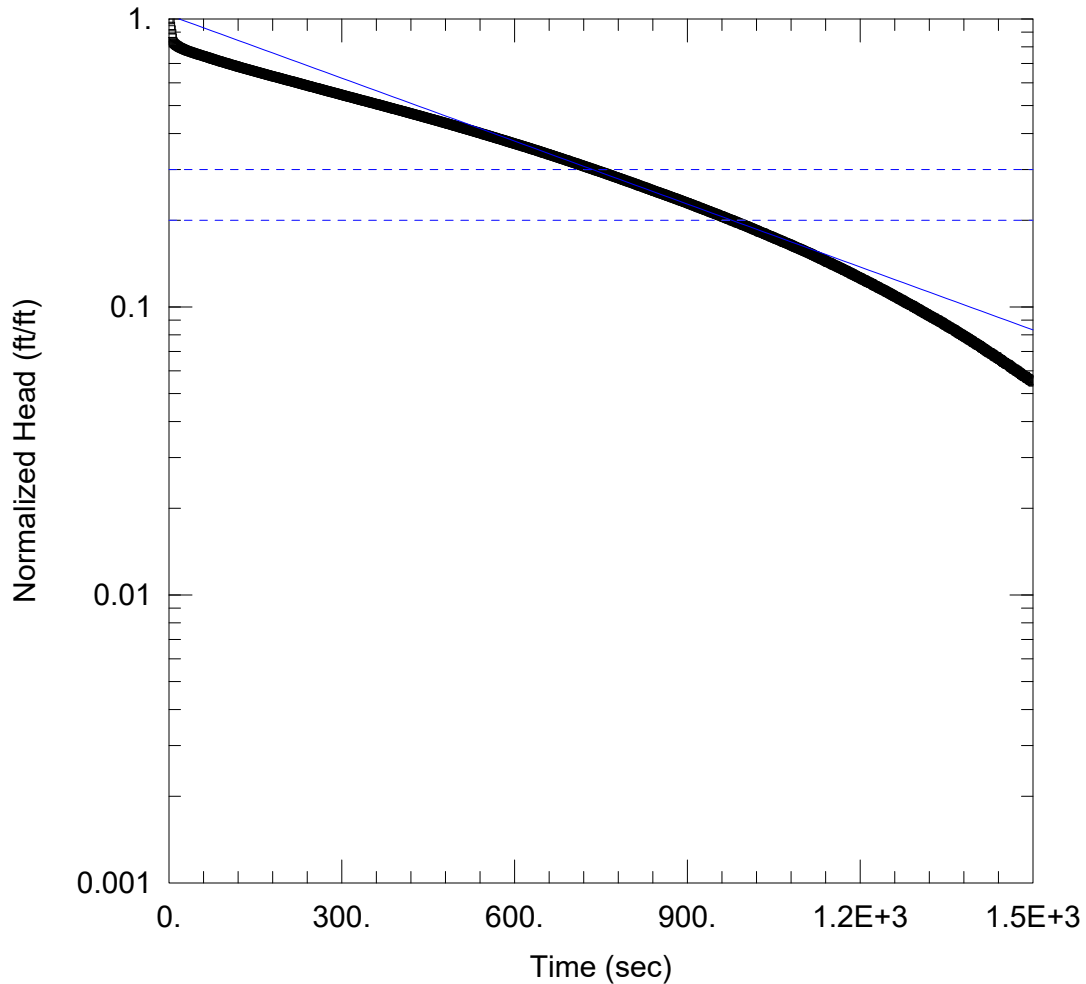
Initial Displacement: 4. ft
 Total Well Penetration Depth: 14. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 14. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.1929 ft/day

Solution Method: Bouwer-Rice
 y0 = 2.305 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-6 - Rising 2.aqt
Date: 09/01/22

Time: 14:50:57

PROJECT INFORMATION

Company: GZA
Client: Vulcan
Project: 20.0157528.00
Location: Orangeburg County, SC
Test Well: MW-6
Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-6)

Initial Displacement: 2.6 ft
Total Well Penetration Depth: 14. ft
Casing Radius: 0.08333 ft

Static Water Column Height: 14. ft
Screen Length: 7. ft
Well Radius: 0.3438 ft

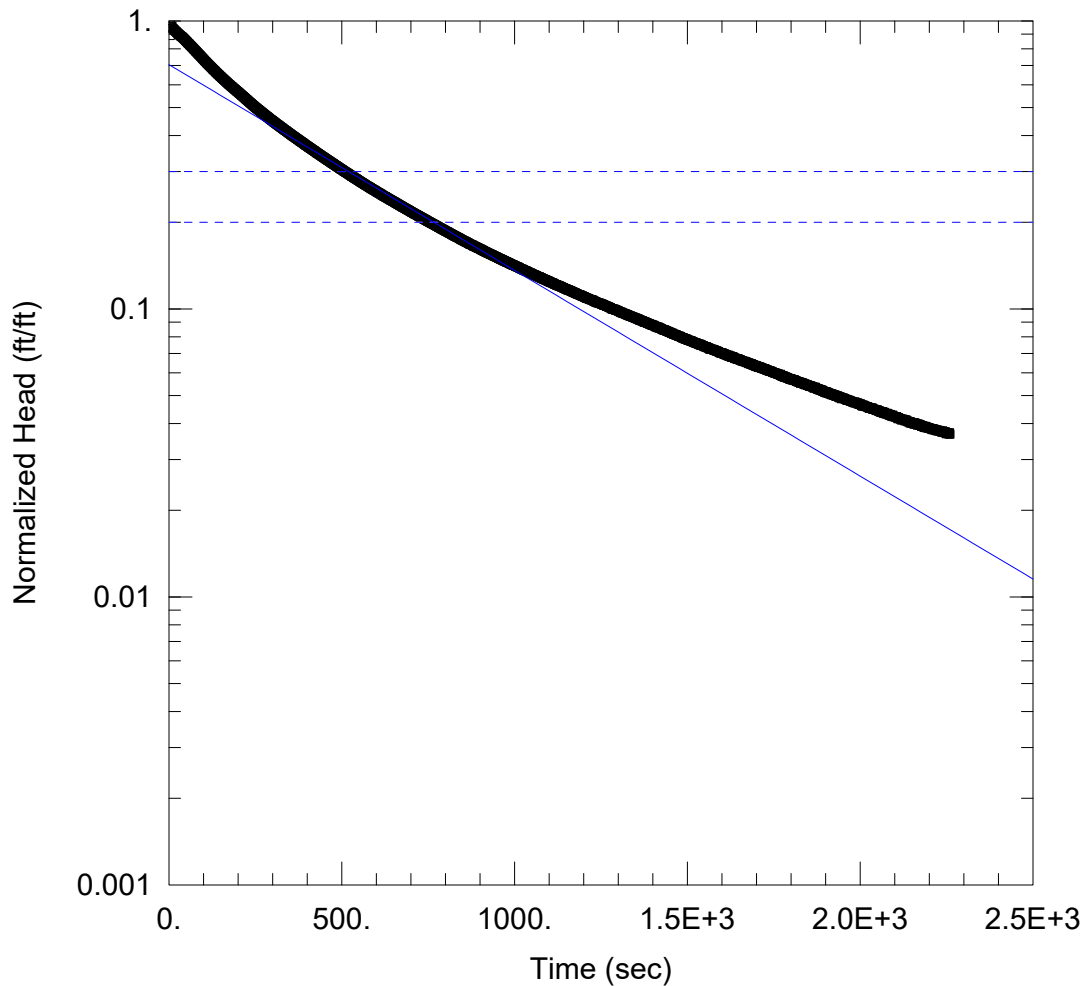
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.2232 ft/day

y0 = 2.678 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-9 - Falling 1.aqt
Date: 09/01/22

Time: 14:52:06

PROJECT INFORMATION

Company: GZA
Client: Vulcan
Project: 20.0157528.00
Location: Orangeburg County, SC
Test Well: MW-9
Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-9)

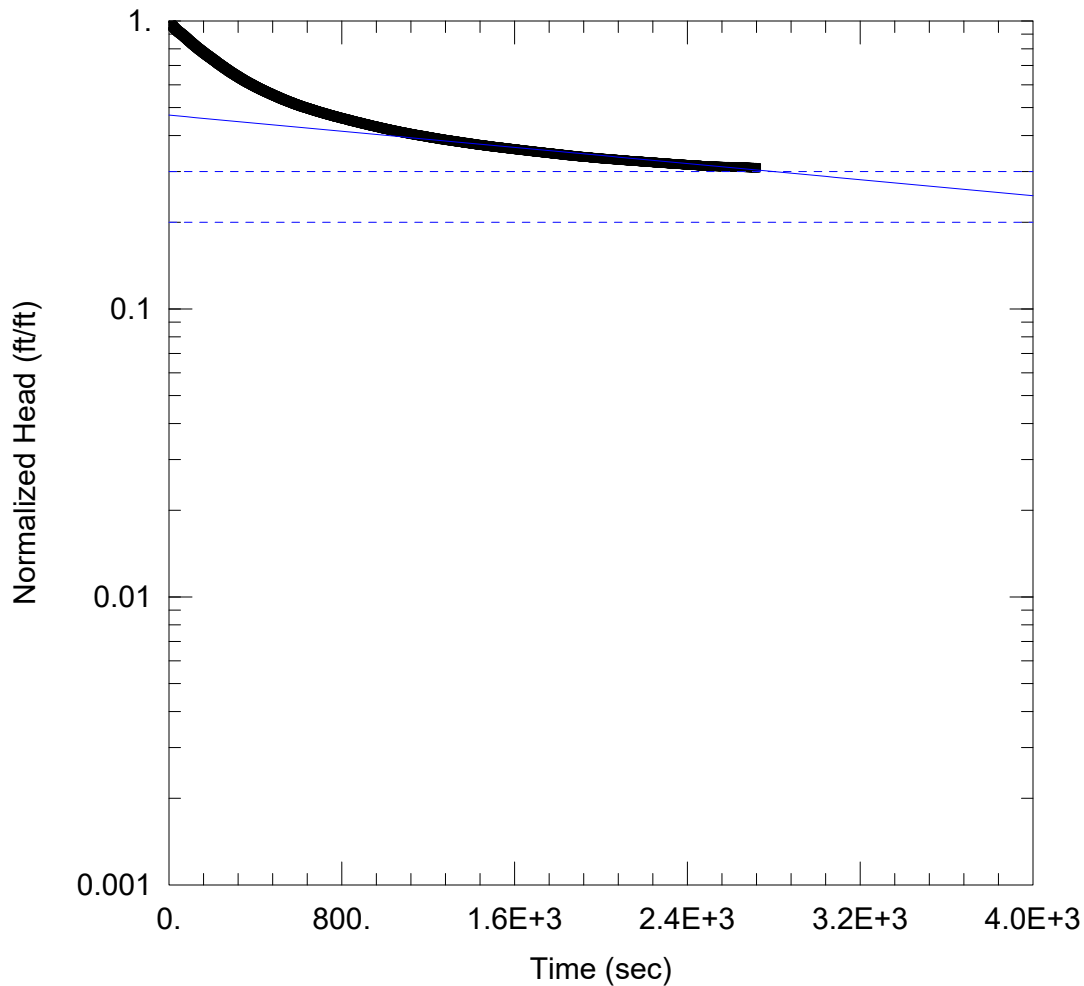
Initial Displacement: 2.3 ft
Total Well Penetration Depth: 18. ft
Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
Screen Length: 7. ft
Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.2297 ft/day

Solution Method: Bouwer-Rice
y0 = 1.622 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-9 - Falling 2.aqt
 Date: 09/01/22

Time: 14:52:56

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-9
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-9)

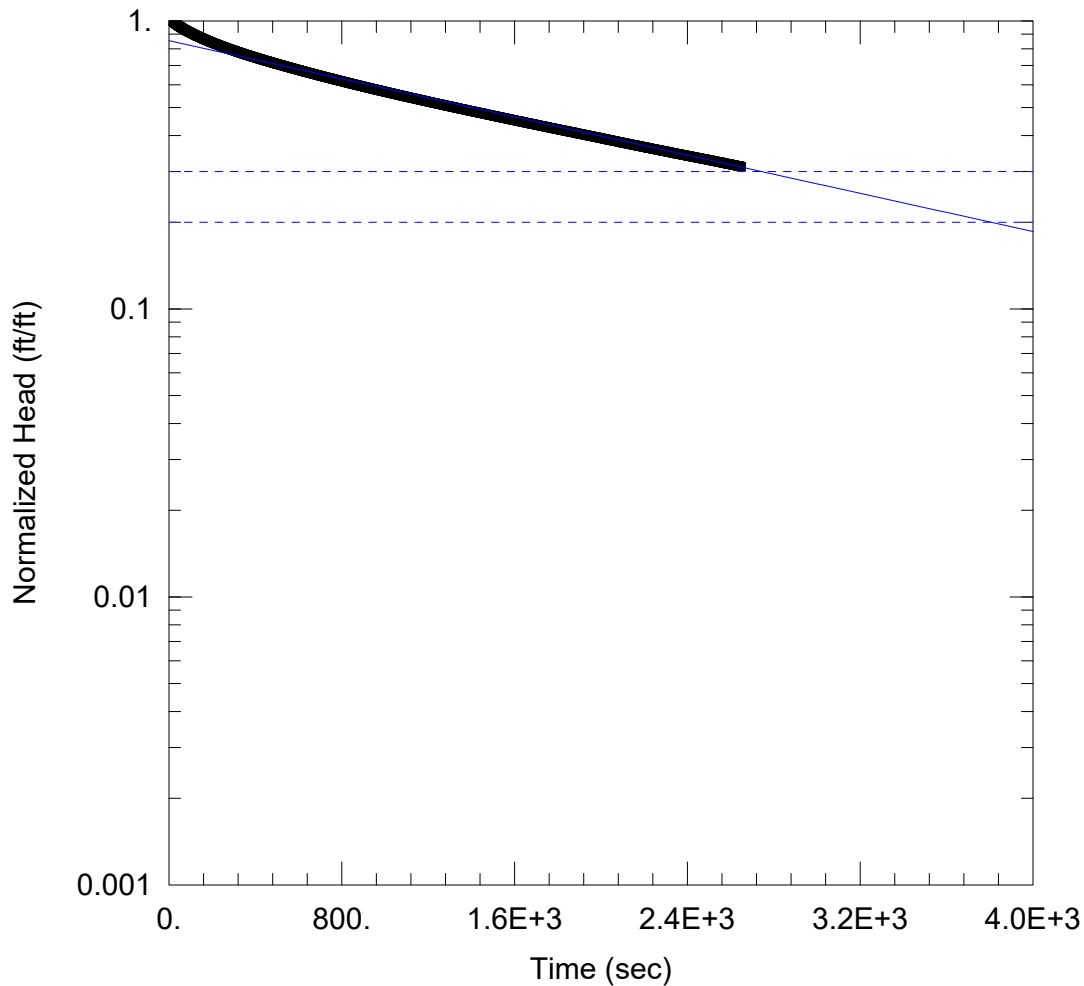
Initial Displacement: 2.3 ft
 Total Well Penetration Depth: 18. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.02251 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.083 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-9 - Rising 1.aqt
 Date: 09/01/22

Time: 14:54:10

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-9
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-9)

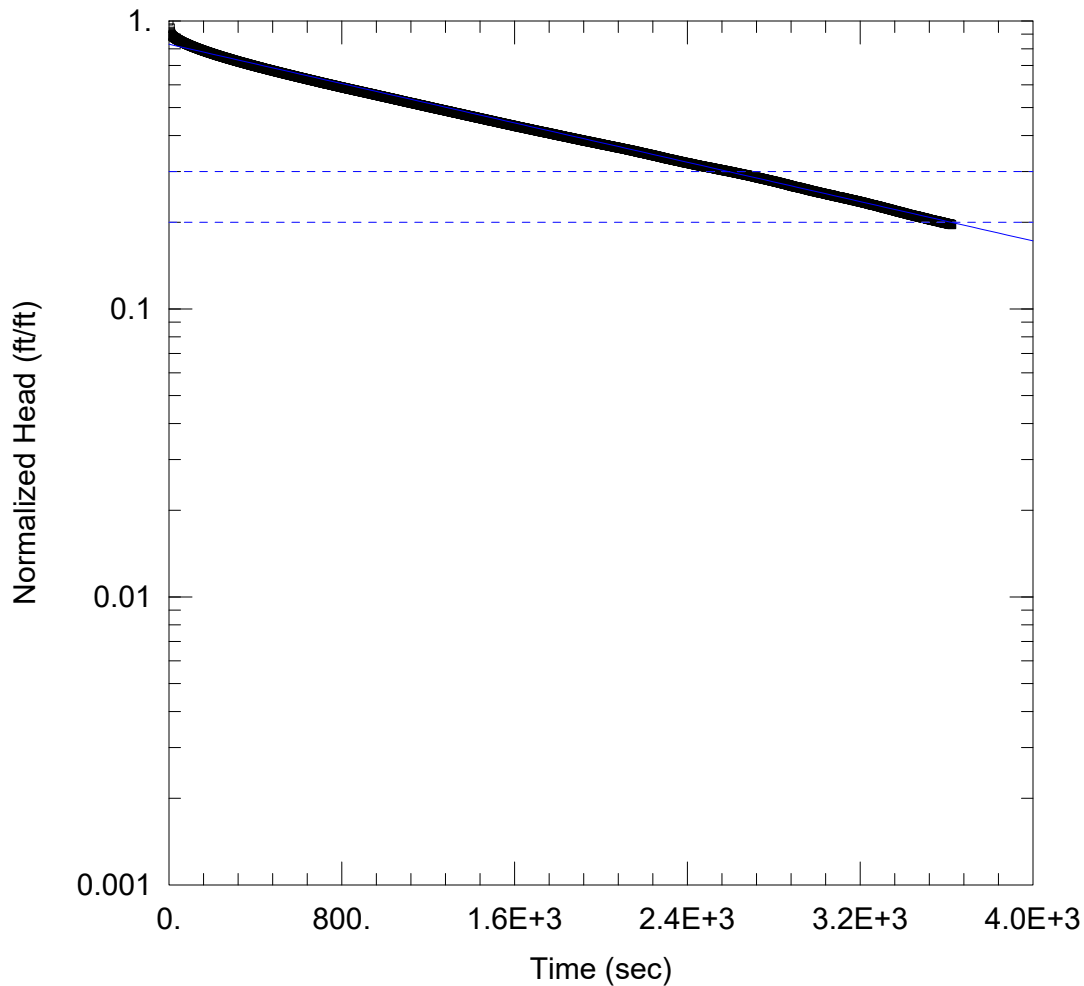
Initial Displacement: 2.3 ft
 Total Well Penetration Depth: 18. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.05325 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.964 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-9 - Rising 2.aqt
 Date: 09/01/22

Time: 14:55:20

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-9
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-9)

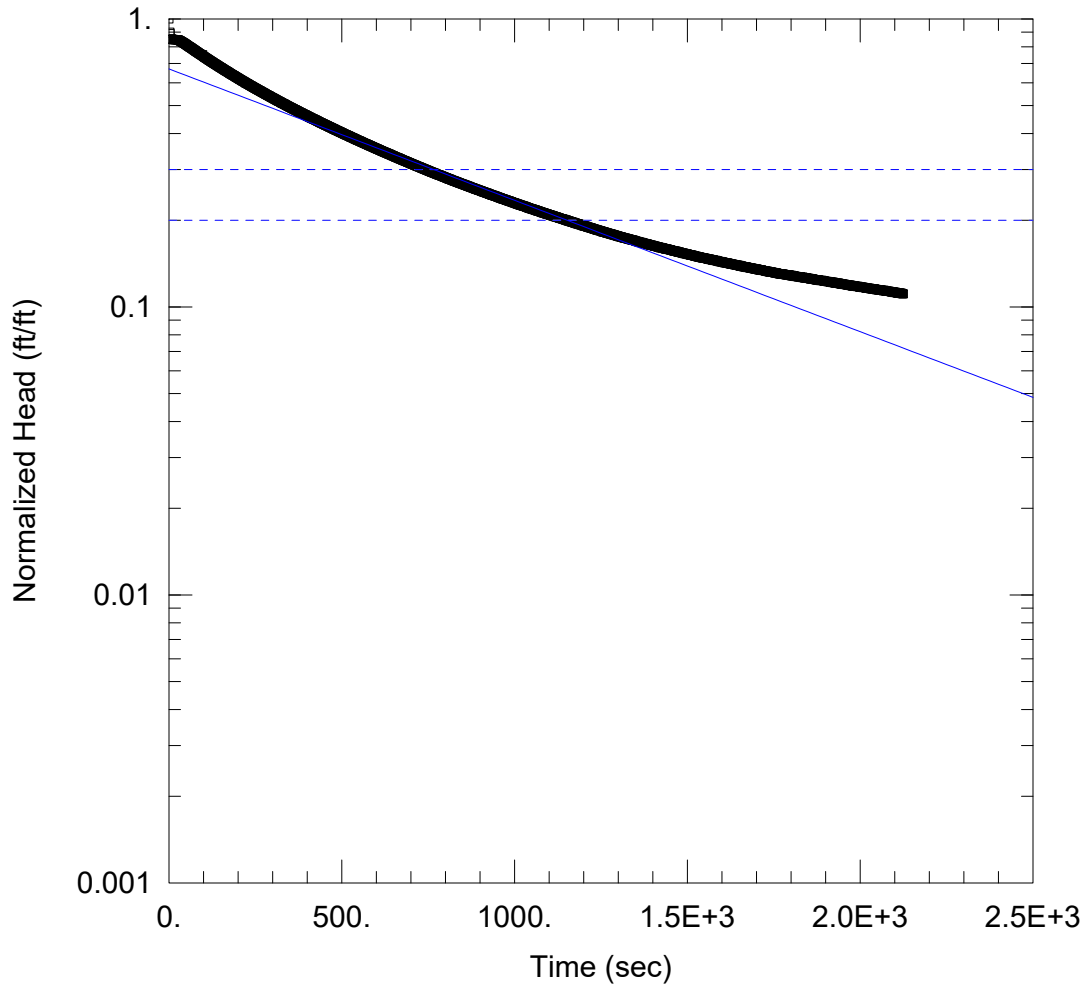
Initial Displacement: 2.3 ft
 Total Well Penetration Depth: 18. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 18. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.05488 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.909 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-10 - Falling 1.aqt
 Date: 09/01/22

Time: 14:56:10

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-10
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-10)

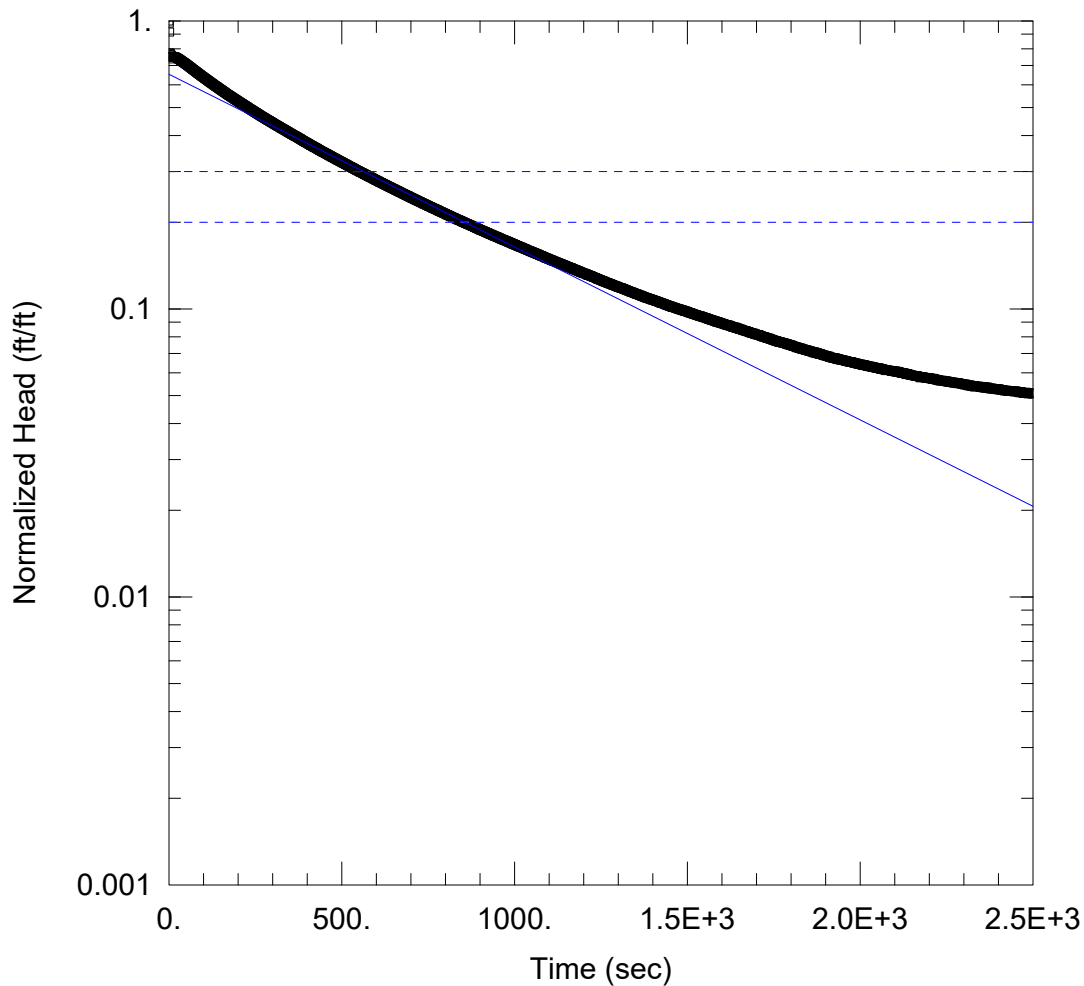
Initial Displacement: 2.3 ft
 Total Well Penetration Depth: 19. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 19. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.1484 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.542 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-10 - Falling 2.aqt
 Date: 09/01/22

Time: 14:57:05

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-10
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-10)

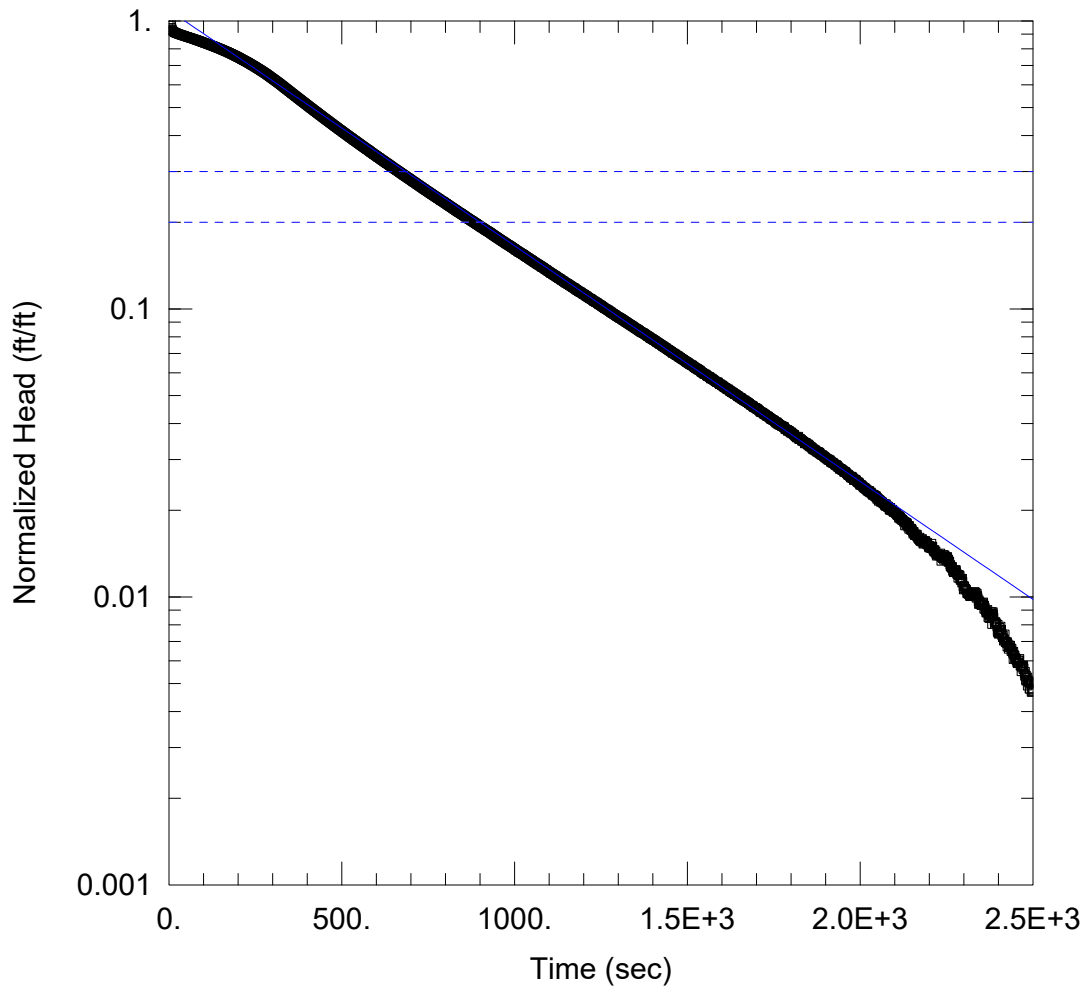
Initial Displacement: 2.8 ft
 Total Well Penetration Depth: 19. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 19. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.1952 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.828 ft



ORANGEBURG COUNTY SITE

Data Set: \\...MW-10 - Rising 1.aqt
 Date: 09/01/22

Time: 15:01:12

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-10
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-10)

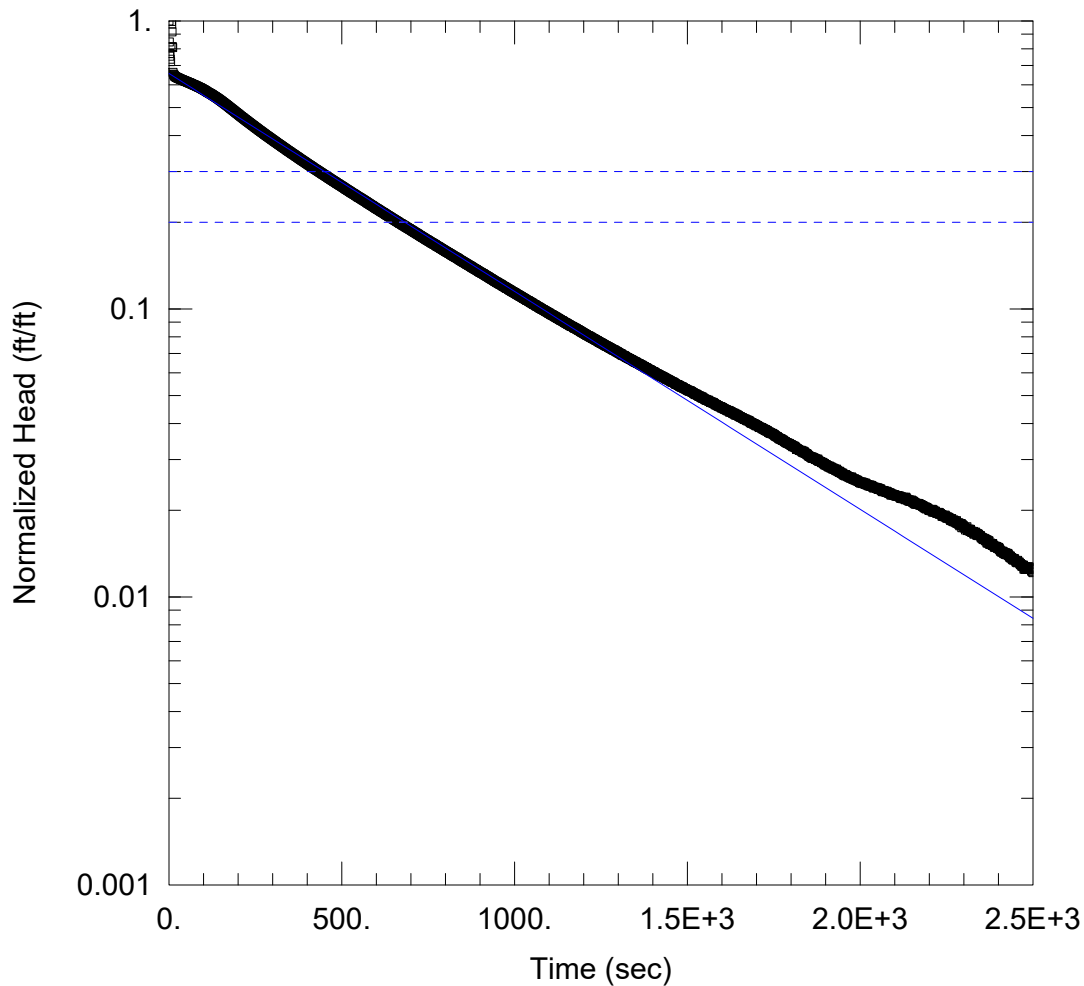
Initial Displacement: 2.5 ft
 Total Well Penetration Depth: 19. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 19. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.2662 ft/day

Solution Method: Bouwer-Rice
 y0 = 2.725 ft



ORANGEBURG COUNTY SITE

Data Set: \...\MW-10 - Rising 2.aqt
 Date: 09/01/22

Time: 15:05:51

PROJECT INFORMATION

Company: GZA
 Client: Vulcan
 Project: 20.0157528.00
 Location: Orangeburg County, SC
 Test Well: MW-10
 Test Date: 8/19/22

AQUIFER DATA

Saturated Thickness: 25. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-10)

Initial Displacement: 3.5 ft
 Total Well Penetration Depth: 19. ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 19. ft
 Screen Length: 7. ft
 Well Radius: 0.3438 ft

SOLUTION

Aquifer Model: Unconfined
 K = 0.2461 ft/day

Solution Method: Bower-Rice
 y0 = 2.298 ft