SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION WATER POLLUTION CONTROL PLANT SEWERAGE SYSTEM IMPROVEMENTS GROVETOWN, GEORGIA GEC PROJECT NO. 150874.210

PREPARED FOR

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JANUARY 12, 2016

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GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS, INC

January 12, 2016

Mr. John McClellan
G. Ben Turnipseed Engineers
4210 Columbia Road, Building 3
Augusta, Georgia 30907

SUBJECT: Subsurface Exploration and Geotechnical Engineering Evaluation
Water Pollution Control Plant
Sewerage System Improvements
Grovetown, Georgia
GEC Project No. 150874.210

Dear Mr. McClellan:

Geotechnical & Environmental Consultants, Inc. (GEC) is pleased to present this report of our subsurface exploration and geotechnical engineering evaluation for the above site. The purpose of this exploration was to obtain data to evaluate the site and subsurface conditions in order to provide recommendations relative to the geotechnical aspects of the project.

We greatly appreciate the opportunity to provide these services to you. If you have any questions, or if we can be of further assistance, please do not hesitate to call.

Sincerely,

GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS, INC.

Geoffrey A. Madrazo, P.E.
Project Engineer
Ga. Reg #40568

GAM/TED/gam

Thomas E. Driver, P.E.
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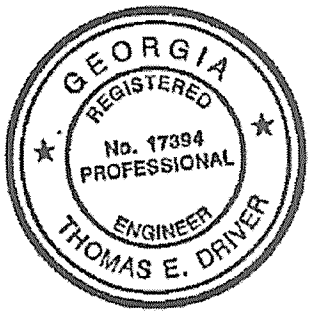

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1.0 EXECUTIVE SUMMARY

The following summary highlights our pertinent findings and recommendations concerning this project.

- Site preparation will include the removal of any existing gravel, topsoil or cultivated/spray field soils, as well as vegetation and any soft/loose near-surface soils in the planned construction areas. All stripped materials and debris should be disposed off-site or in non-structural areas.

- The on-site materials appear to be suitable for use as structural fill.

- Refusal to the auger process was not encountered within the depths explored and is not anticipated to impact construction activities.

- Groundwater was encountered in the borings at the time of drilling. Shallow groundwater was encountered in borings B-3 through B-13, and the presence of groundwater is anticipated to impact construction activities.

- Site dewatering operations may be required prior to and during construction. The extent of dewatering required can be best determined at the time of construction.

- We recommend using conventional shallow foundations for support of the proposed structures. An allowable soil bearing pressure of 3,000 psf may be used for design of shallow foundations bearing on competent soils at the proposed foundation elevations.

- The concrete slab-on-grade floor for the proposed structures may be designed using a modulus of subgrade reaction of 100 pci for the soil types encountered at the site.

This executive summary has been prepared solely to provide a general overview of the report. The executive summary should not be relied upon for any purpose except for a general overview. Please rely on the full report for information concerning the findings, recommendations and other concerns at the site.

2.0 PROJECT INFORMATION

Our understanding of the project is based on conversations with representatives from G. Ben Turnipseed Engineers. The proposed Water Pollution Control Plant is to be located within and around existing spray fields located on the north side of Lakeview Drive in Grovetown, Georgia, as shown on the *Site Location Map* in the Appendix.

We understand the proposed development will consist of the construction of a screen and grit structure, raw sewage pump station, four (4) sequence batch reactors (SBR's), UV/filters/effluent pump station/plant pump station, aerobic digester, sludge dewatering building, maintenance/blower building, chemical structure, control building, and associated drives and piping. All construction will take place on the subject property located on Lakeview Drive in Grovetown, Georgia. The proposed development is shown on the *Boring Location Plans* in the Appendix.

Based on the site plan and preliminary structural elevations provided to GEC, we anticipate that maximum excavations will be on the order of 15 to 25 feet below the existing grades for the screen and grit structure, raw sewage pump station, SBR's, and UV/filters/effluent pump station/plant pump station. Maximum excavations will be on the order of 10 feet below the existing grades for the aerobic digester. Fill sections are expected to be on the order of five (5) feet or less.

Structural plans have not been provided to GEC at this time. We assume that the maximum column loads will not exceed 50 kips and the maximum wall loads will not exceed three kips per foot.

3.0 METHOD OF EXPLORATION

3.1 Site Conditions

GEC performed a general review of the proposed project site and surrounding areas on December 16, 2015, prior to the performance of our subsurface exploration activities. The review was performed to evaluate surface conditions that could impact our exploration techniques or the proposed construction.

The locations and depths of the borings were selected by GEC based on the proposed site plan. The boring locations were marked in the field with a handheld GPS and by measuring from existing features.

3.2 Soil Test Borings

A total of 13 soil test borings were performed at the project site. The boring designated B-1 was performed near the proposed screen and grit structure and was extended to a depth of 30 feet below the existing ground surface. The boring designated B-2 was performed near the proposed raw sewage pump station and was extended to a depth of 30 feet below the existing ground surface. Borings designated B-3 through B-7 were performed near the proposed sequence batch reactors (SBR's) and were extended to a depth of 30 feet below the existing ground surface. Boring designated B-8 was performed near the proposed UV/filter/effluent pump station/plant pump station and was extended to a depth of 30 feet below the existing ground surface. Boring designated B-9 was performed near the proposed aerobic digester and was extended to a depth of 25 feet below the existing ground surface. Boring designated B-10 was performed near the sludge dewatering building and was extended to a depth of 20 feet below the existing ground surface. Boring designated B-11 was performed near the maintenance/blower building and was extended to a depth of 20 feet below the existing ground surface. Boring designated B-12 was performed near the chemical structure and was extended to a depth of 15 feet below the existing ground surface. Boring designated B-13 was performed near the control building and was extended to a depth of 15 feet below the existing ground surface. The approximate locations of the borings are presented on the *Boring Location Plans* located in the Appendix.

All borings were backfilled with the auger cuttings prior to site demobilization. The split-spoon samples were returned to our laboratory and were manually and visually examined and classified. The samples were classified according to the Unified Soil Classification System (USCS). Detailed records of the soil test borings, indicating the N-values (blow counts) obtained from the Standard Penetration Testing (SPT) and a more detailed description of the drilling and sampling processes, are presented in the Appendix.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 Site Description

The proposed project is located on the north side of Lakeview Drive in Grovetown, Georgia. The proposed site consists of an existing spray field system, treatment ponds, and associated ancillary structures. The new construction will take place to the north and east of the existing ponds, and currently consists of an existing influent structure and pump station to the north of the ponds, and an existing spray field area to the east of the ponds. The site generally drains to the north.

4.2 Local Geology

The site is located in the Coastal Plain Physiographic Province of Georgia. Soils in the Coastal Plain are the result of the deposition of sediments in a former marine environment. Coastal Plain

sedimentary deposits make up about 60 percent of Georgia's surface area and consist of a southwardly thickening wedge of sediments that are bordered on the north by the parent rocks of the Piedmont Physiographic Province. The border between these provinces is known as the "Fall-Line." The Coastal Plain sediments range in age from the Cretaceous to the Recent, with the oldest exposed along the "Fall-Line" and the youngest along the coast. Typically, the surface soils consist of complexly interbedded sands, silts, and clays of various mixtures. Sandstones, shales, and limestones comprise the characteristic lithology of the Coastal Plain. These formations are usually found at depths greater than 50 feet but can also be found at or near the ground surface. They are not known to occur near the surface in the site area. Topography in this region of the Coastal Plain is generally flat to gently rolling.

4.3 Subsurface Conditions

Details of the subsurface conditions encountered by the soil test borings are shown on the *Soil Boring Records* in the Appendix of this report. These records represent an estimate of the subsurface conditions based on our interpretation of the boring data using normally accepted engineering judgment. Stratification lines on the *Soil Boring Records* represent approximate boundaries between soil types. However, the in-situ transition is typically more gradual. Although individual test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of the subsurface conditions at other locations or at other times. The general soil conditions and their pertinent characteristics are discussed in the following paragraphs.

General Stratigraphy

The general subsurface stratigraphy of the site consisted of a layer of gravel, topsoil, or cultivated/spray field soil at the surface, with Coastal Plain Sediment soils extending to the maximum depths explored.

Gravel/Topsoil/Cultivated Soil

Gravel was measured at approximated two (2) inches at boring B-1, and contained some organic matter. Topsoil was measured at approximately three (3) inches at boring B-2. A stripping depth of six (6) inches is recommended in this area to account for any variation in thickness.

Cultivated/spray field soil was measured at approximately 12 inches at borings B-3 through B-13. A stripping depth of 12 inches is recommended for planning and budgeting purposes.

Coastal Plain Sediment Soils

The Coastal Plain Sediment soils encountered in all of the borings generally consisted of very loose to very dense sands (SC, SM) with various silt and clay contents, as well as very soft to very

stiff silts and clays (ML, MH, CL, CH). The SPT N-values in these soils ranged from 0 to 50/3" blows per foot (bpf).

Groundwater

Groundwater was encountered in most of the borings at the time of drilling. Shallow groundwater was encountered at borings B-3 through B-13. Due to deep cut sections for several of the structures in this area, we anticipate that the presence of the groundwater will impact construction activities and will require dewatering.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Due to the site being located on an existing and active land application system, it is to be expected that the near-surface conditions are saturated and the groundwater table is relatively close to the surface. It is recommended that the land application system be shut-off for several weeks prior to construction, in the general area to be disturbed. Additional dewatering should be expected and may require temporary or permanent sump pumps.

5.1 Site and Subgrade Preparation

The initial step in general site preparation for the new structures and the parking and drive areas should consist of the removal of gravel, topsoil, or cultivated/spray field soil, as well as any vegetation, and soft/loose near-surface soils in the planned construction areas. Any utility lines in the project area should be removed and relocated. Excavations or holes resulting from the removal of utilities should be backfilled with structural fill to the compaction requirements presented in Section 5.2, *Earthwork*. We estimate that the gravel thickness at boring B-1 is approximately two (2) inches, and the topsoil thickness at boring B-2 is approximately three (3) inches. We recommend a depth of six (6) inches for planning purposes. We estimate that the cultivated/spray field soil thickness at borings B-3 through B-13 is approximately 12 inches, and we recommend a depth of 12 inches for planning purposes. Stripped material should be moved outside of any fill areas and may be used as landscaping materials.

Care should be taken with near-surface soils containing fine-grained particles (particles passing the 200 sieve) during grading. When exposed to moisture, the workability and strength of these near-surface soils deteriorates significantly, and the need for undercutting and other construction delays may result. We recommend that construction grades be maintained throughout this project in such a manner so to establish positive drainage away from working surfaces and subgrades.

Following site stripping, we recommend that all proposed fill areas or areas at-grade be proofrolled in the presence of a geotechnical engineer or his representative to evaluate subgrade stability. Proofrolling should be performed with a fully loaded tri-axle dump truck, 20-ton roller, or similar

equipment in an overlapping pattern to detect any soft or loose areas. Any areas that pump or rut excessively and cannot be densified by continued rolling should be undercut to a depth to be determined in the field by the geotechnical engineer, and be replaced with structural fill.

In general, if loose/soft soils are encountered in structural areas, the soils will need to be reworked or undercut to a point 10 feet outside the perimeters of the structural areas. We anticipate that the majority of these soils can be compacted in place, however very soft/loose soils were encountered near the surface at borings B-3 and B-6. Some undercutting of localized areas may be necessary, but it is not anticipated that undercutting will be significant. The extent of the reworking necessary will depend on the final grading plans and the climatic conditions at the time of construction. All undercut areas should be backfilled with structural fill as described in Section 5.2, *Earthwork*, of this report.

Prior to fill placement, the subgrade should be scarified, moisture-conditioned to slightly above the optimum moisture content, and compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D698) in all structural or paved areas. All at-grade areas and cut surfaces should be scarified, moisture conditioned to slightly above the optimum moisture content, and compacted to at least 98 percent of the same criteria.

5.2 Earthwork

The soil test borings indicate the near-surface soils at the site can be graded with conventional earthmoving equipment such as self-loading or pusher-assisted pans and tracked dozers. The near-surface soils appear to be suitable for use as fill material. However, wetting or drying of the soils at the site may be necessary to achieve the required compaction criteria. The contractor should be required to have equipment available on site for both wetting and drying of the soils.

In general, all fill placed at the site, including on-site soils, should not contain rocks or lumps larger than four (4) inches in greatest dimension and contain no more than 15 percent larger than 2.5 inches. Structural fill soils should have a liquid limit less than 50, plastic index less than 30 and a standard Proctor maximum dry density (ASTM D698) greater than 90 pcf. Generally, soils classified as SP, SM, SC, ML or CL according to the Unified Soil Classification System are considered suitable for fill providing they meet the above criteria.

Structural fill should be moisture-conditioned to slightly above the optimum moisture content, spread in relatively thin lifts (8-inch maximum loose lifts) and methodically compacted with heavy compaction equipment to at least 95 percent of the standard Proctor maximum dry density (ASTM D698). The upper one-foot of fill material should be compacted to a 98 percent compaction criterion. Additionally, the upper one-foot of material in areas at-grade or cut surfaces should be scarified and compacted to the 98 percent criteria. Structural fill criteria should be utilized beneath proposed and future structural areas.

Structural fill should extend horizontally beyond the outer edge of the foundations at least 10 feet or a distance equal to the height of the fill to be placed, whichever is greater. In paved areas, fill slopes should extend horizontally at least five feet beyond the edge of pavement prior to sloping.

Utility trenches should be backfilled with materials satisfying the criteria described above for general fill, placed in lifts of approximately eight (8) inches in uncompacted thickness. However, thicker lifts may be used provided the method of compaction is approved by the project geotechnical engineer and the required minimum degree of compaction is achieved.

5.3 Foundations

The proposed structures can be constructed on conventional shallow foundations or structural slabs bearing on the in-place soils, reworked soils, or structural fill meeting the compaction requirements of Section 5.2, *Earthwork*. Based on the soils encountered during our exploration at the proposed foundation elevation, we recommend a uniform net allowable soil bearing pressure of **3,000 psf** be used for shallow foundation design of the proposed structures once the on-site soils are treated as outlined in this report. Exterior foundations should bear at a minimum of 18 inches below external grades to preclude damage due to frost penetration.

Using assumed structural loads, we estimate that total post-construction settlement of up to one (1) inch will occur. Differential settlement should be approximately 50% of the total settlement over a distance of 30 feet. Individual spread footings should have a minimum dimension of 24 inches and strip footings should have a minimum lateral dimension of 20 inches.

A Geotechnical Engineer or his representative should examine footing subgrades immediately prior to rebar placement to confirm that the foundation conditions are as anticipated and the design bearing pressure is available. Auger and hand-held dynamic cone penetrometer testing, augmented by hand probing, should be used to determine whether conditions within these areas are consistent with those encountered by the borings.

5.4 Slab Design

Assuming that the upper 12 inches of subgrade consist of properly compacted and proofrolled existing soil or newly installed fill material compacted to a minimum of 98% of standard Proctor maximum dry density, concrete slab-on-grade floors for the proposed building may be designed using a modulus of subgrade reaction of 100 pci. A modulus of subgrade reaction of 200 pci may be used if at least 6 inches of No. 57 stone or compacted graded aggregate base is provided below the slab. A durable vapor barrier should be provided beneath soil supported slabs to reduce dampness due to soil moisture.

5.5 Slopes

Several of the structures will be excavated to depths of up to 15 feet below the existing grade. All excavations should be made to conform to current OSHA regulations. After construction of the various walls and foundations, the excavations should be backfilled using the compaction criteria discussed in Section 5.2, *Earthwork*, of this report.

For final site slopes, based on our experience with soils similar to those encountered during our exploration, we recommend excavated slopes less than 10 feet be laid back at least to a 2H:1V (Horizontal to Vertical) slope. Permanent fill slopes placed on suitable subgrade may be constructed at 2.5:1 or flatter. All fill slopes should be adequately compacted as recommended in this report. Permanent slopes of 3:1 or flatter may be used to facilitate mowing. All sloped surfaces should be protected from erosion by grassing or other means. All confined excavations should conform to the latest OSHA Regulations.

5.6 Lateral Earth Pressures

Based on the borings drilled for this exploration and the testing of reasonably similar soils on other projects, the following earth pressure coefficients are recommended for the near surface in-place soils at the site:

Active Earth Pressure (Ka)	At-Rest Earth Pressure (Ko)	Passive Earth Pressure (Kp)	Frictional Sliding Resistance (fs)
0.33	0.50	3.00	0.38

The earth pressure coefficients presented in the preceding table are based on our experience with similar projects having similar soil conditions. These coefficients were estimated based on an assumed angle of internal friction of approximately 30°. For sliding resistance purposes, a soil cohesion value should be neglected for design. Triaxial shear testing, which was beyond the scope of this exploration, would be required to determine the actual strength properties of the soils at this site. A moist unit weight of 120 pounds per cubic foot should be used for design calculations.

Our recommendations assume that the ground surface above the wall is level and the residual soils similar to those found in our borings will be used for wall backfill.

The recommended values assume that constantly functioning drainage systems are installed to prevent the accidental backup of hydrostatic pressures behind the wall system. Tractors and other heavy equipment should not operate within five feet of below grade walls to prevent lateral pressures in excess of those cited above.

These recommendations should not be correlated with soil parameters for use in any Mechanically Stabilized Earth (MSE) wall design. We recommend that soil parameters for any MSE retaining wall design be established through appropriate laboratory testing initiated by the wall designer.

5.7 Pavement Recommendations

The following pavement recommendations are issued for preliminary purposes. We recommend that we be allowed to perform an actual design based on design traffic loads once determined.

A preliminary analysis for flexible pavements was performed in general accordance with the American Association of State Highway and Transportation Officials (AASHTO) "Guide For Design of Pavement Structures", 2006. The AASHTO method considers the effects of traffic by equating the traffic loading to an Equivalent Single Axle Load (ESAL) of 18 kips. This is done by Equivalent Axle Load Factors (EALF). The EALF is applied to the each axle that crosses the pavement in order to consider its individual effect on the life of the pavement.

Based on the above assumptions, a design California Bearing Ratio (CBR) of at least four would be required for the reworked soils. We recommend that field and/or laboratory CBR testing be performed during construction to verify these recommendations. Based on the assumed loadings, the following pavement sections are recommended for this site:

RECOMMENDED PAVEMENT DESIGN SECTION				
Pavement Type	Anticipated Pavement Use	Pavement Components		Total Thickness (inches)
		Asphalt Concrete (inches)	Aggregate Base (inches)	
Flexible	Light Duty	2*	6	8
Flexible	Heavy Duty	3**	8	11

* The light duty surface course should consist of 2 inches of 9.5 mm Superpave
** The heavy duty surface course should consist of 1 inch of 9.5 mm Superpave over a binder course of 2 inches of 19 mm Superpave.

Based on our analysis, using a CBR value of 4 for the reworked subgrade soils, the flexible pavement design for the paved areas will yield approximate ESAL values of 12400 (SN=1.72) and 105,000 (SN=2.44), respectively for the light and heavy duty paving sections. It is extremely important to remember that if the actual traffic loads are anticipated to exceed those presented above; the design sections should be re-evaluated for the actual design conditions. Our analysis assumes the pavement subgrades are prepared in accordance with the recommendations outlined in this report.

5.8 Seismic Design Criteria

The seismic site classification for the proposed project was evaluated using the criteria given in the 2012 International Building Code (IBC 2012) section 1613. Based on the project information and soil test borings, we recommend the following parameters be used in design:

- Site Classification — Class D
- Maximum Considered Earthquake (MCE) spectral response acceleration for short period — S_{MS} = 0.429 g
- MCE spectral response acceleration for 1-second period — S_{M1} = 0.255 g
- Design spectral response acceleration for short period — S_{DS} = 0.286 g
- Design spectral response acceleration for 1-second — S_{D1} = 0.170 g

5.9 Geotechnical Controls

1. The Geotechnical Engineer should be provided the opportunity for a general review of the final design documents in order to assess proper interpretation of the earthwork and foundation recommendations.

2. The Geotechnical Engineer, or his qualified representative, should observe undercutting and proofrolling operations.

3. A qualified engineering technician, under the supervision of the Geotechnical Engineer, should observe fill operations and perform a minimum of one field density test per 2,500 square feet of area for each one-foot thickness of fill.

4. The Geotechnical Engineer, or his qualified representative, should check each foundation excavation utilizing hand probing and auger and dynamic cone penetrometer testing. This will reduce the risk of unsuitable or soft materials directly underlying the footings, which may be detrimental to the integrity of the structures.

5.10 Limitations

This report is for the exclusive use of G. Ben Turnipseed Engineers, the owner, and subcontractors for the project described herein, and may only be applied to this specific project. The analyses, conclusions and recommendations presented in this report are based on the preceding project information, and the results of this evaluation. Conditions may vary from those observed in the borings.

If it becomes apparent during construction that soil conditions differing from those discussed in this report are encountered, Geotechnical and Environmental Consultants, Inc. should be notified

at once so that the effects may be determined and any remedial measures necessary may be prescribed.

This report has been prepared in accordance with generally accepted standards of geotechnical engineering practice in the State of Georgia. No other warranty is expressed or implied. Our firm is not responsible for conclusions, opinions or recommendations of others.

The right to rely upon this report and the data within may not be assigned without the written permission of Geotechnical and Environmental Consultants, Inc. If the design or location of the structure is changed, the recommendations contained herein must be considered invalid, unless our firm reviews changes and our recommendations are either verified or modified in writing. When design is complete, we should be given the opportunity to review the foundation plans, grading plans and applicable portions of the specifications to determine if they are consistent with the intent of our recommendations.

APPENDIX

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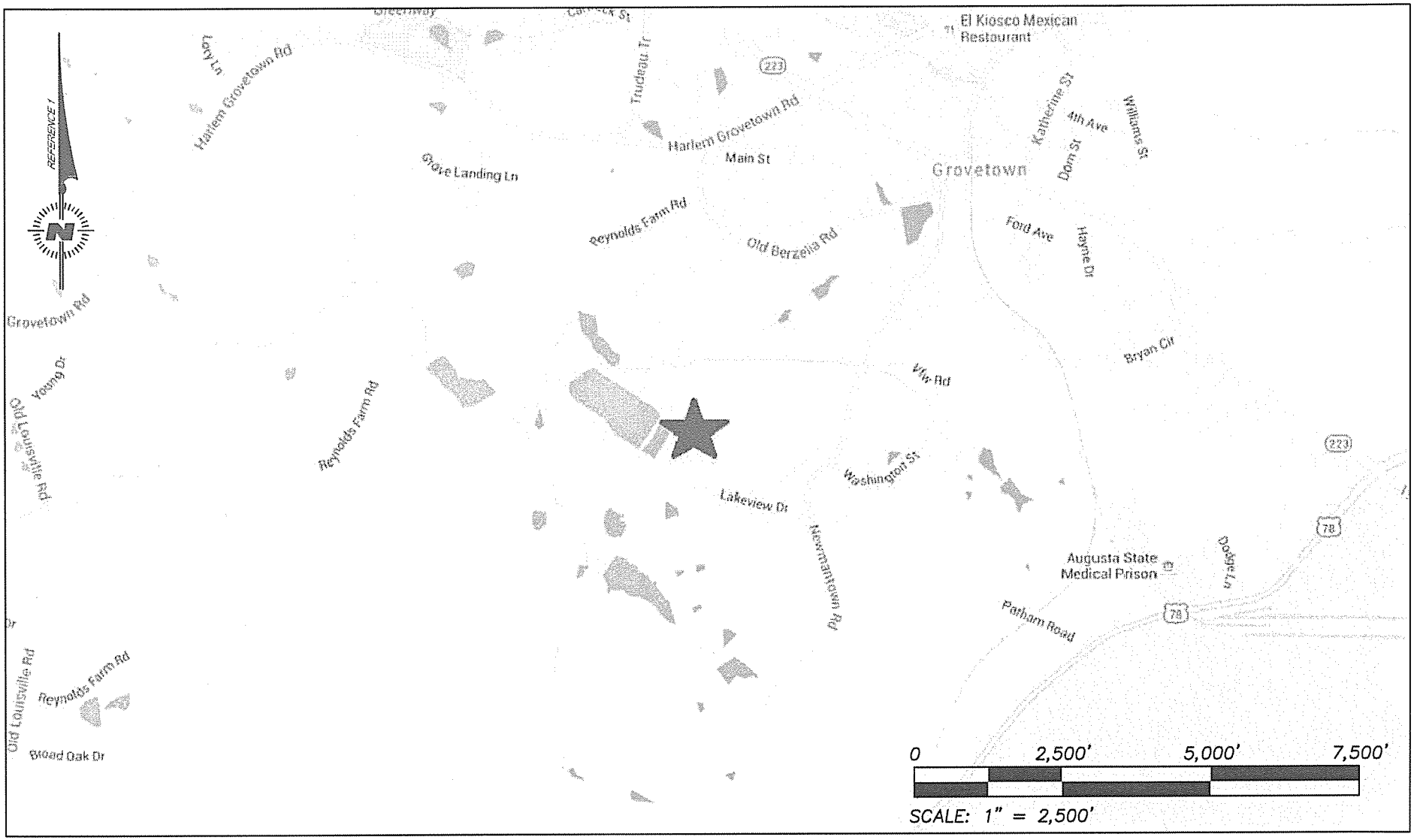

SITE LOCATION MAP
WATER POLLUTION CONTROL PLANT
SEWERAGE SYSTEM IMPROVEMENTS
GROVETOWN, GEORGIA
GEC PROJECT NO. 150874.210

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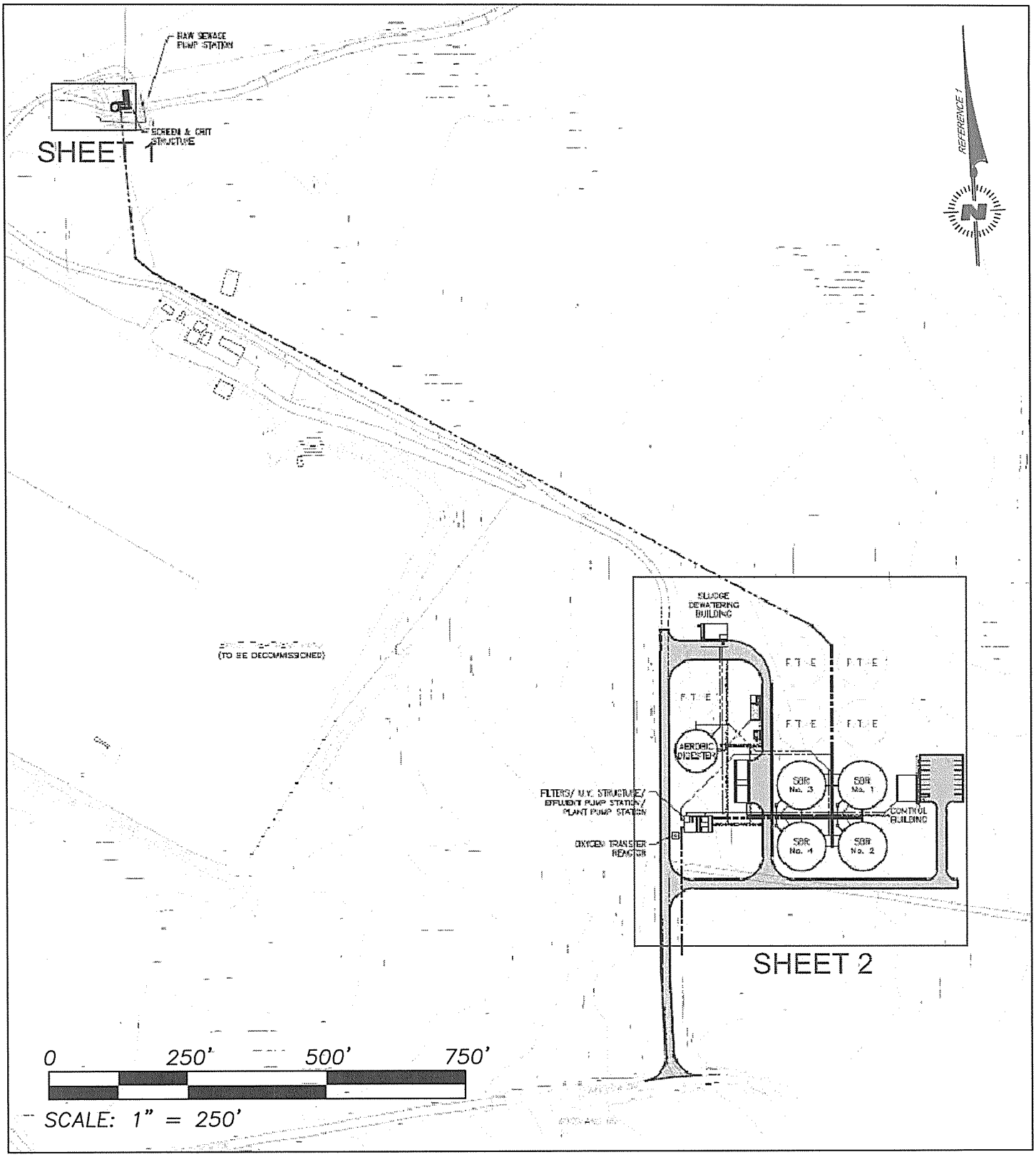

OVERALL SITE MAP
WATER POLLUTION CONTROL PLANT
SEWERAGE SYSTEM IMPROVEMENTS
GROVETOWN, GEORGIA

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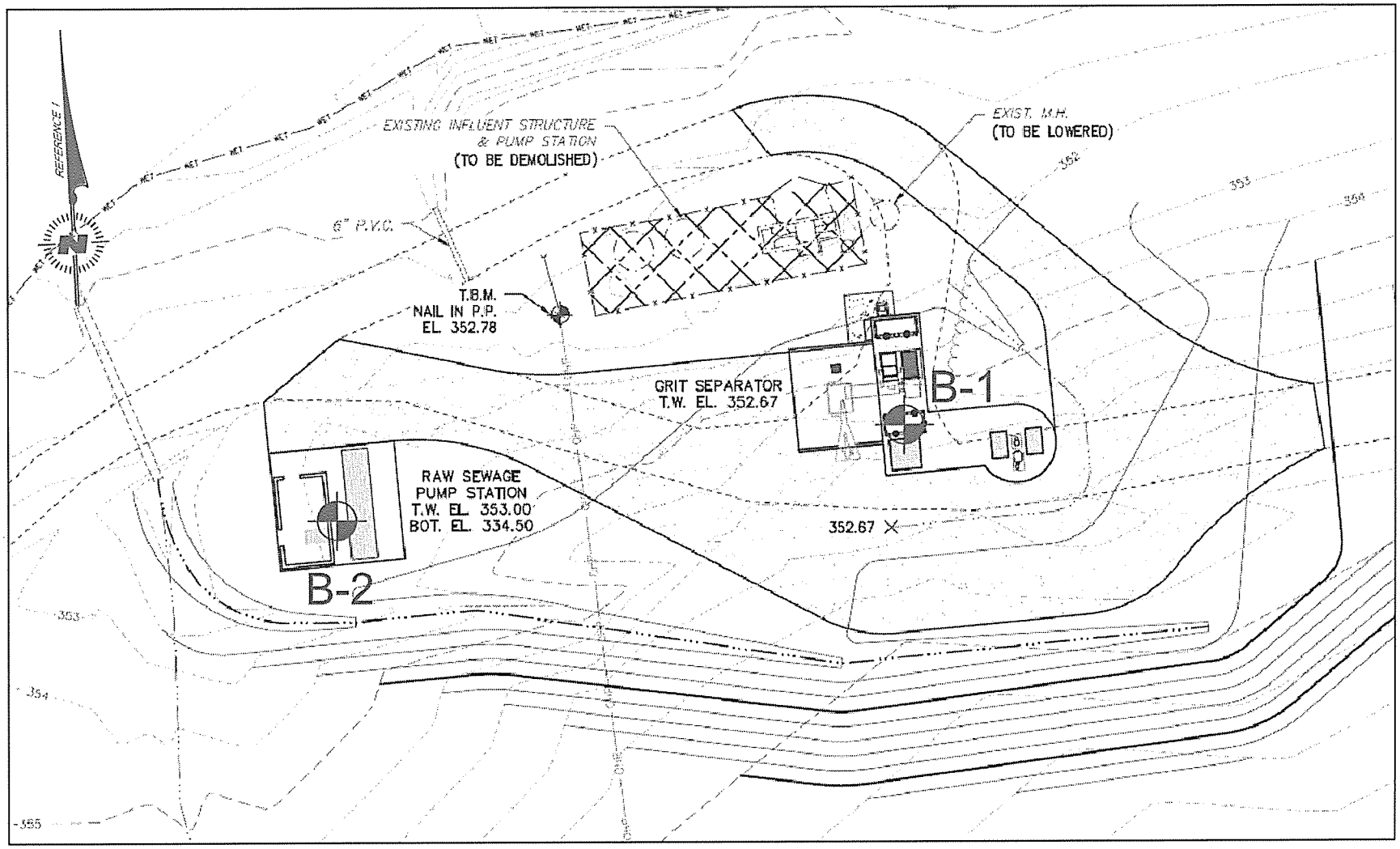

= APPROXIMATE BORING LOCATION

0 30' 60' 90'

SCALE: 1" = 30'

BORING LOCATION PLAN - SHEET 1 OF 2
WATER POLLUTION CONTROL PLANT
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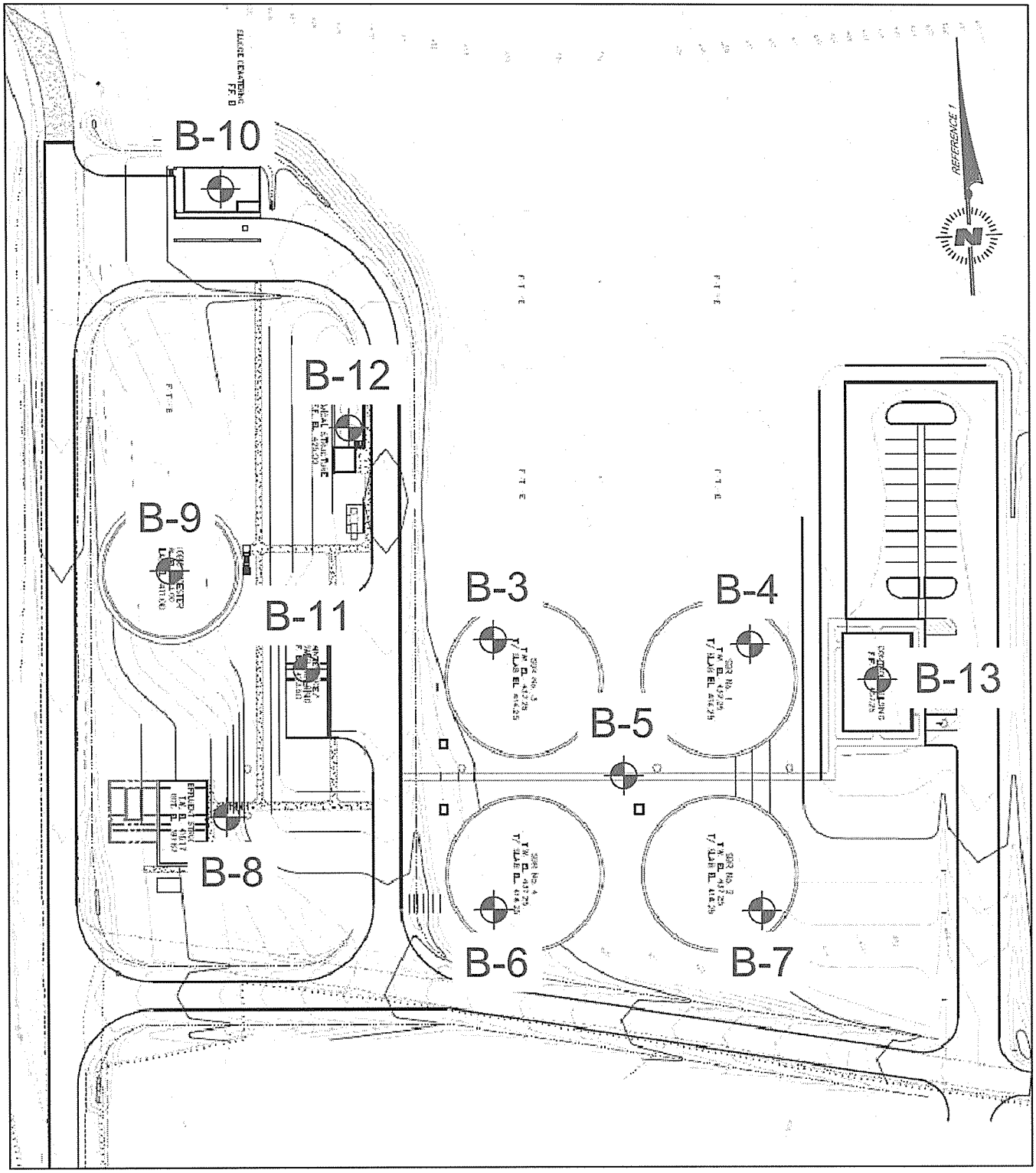

⊕ = APPROXIMATE BORING LOCATION

0 85' 170' 255'

SCALE: 1" = 85'

BORING LOCATION PLAN - SHEET 2 OF 2
WATER POLLUTION CONTROL PLANT
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SOIL TEST BORING PROCEDURES

The borings were advanced by a hollow-stem auger process. At the desired depth in all borings, the borehole was cleaned out and the sample tools inserted through the auger stems. At assigned intervals, soil samples were obtained with a standard 1.4-inch inside diameter, 2-inch outside diameter split tube sampler. The sampler was first seated six inches to penetrate any loose cuttings; then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the final foot was recorded and is designated as the standard penetration resistance (N-value). The penetration resistance, when properly evaluated, may be used as an index to the soil strength and foundation support capability. Soil sampling and penetration testing were performed in general accordance with ASTM D 1586.

The drilling method is not capable of penetrating material designated as "refusal materials." Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams, or the upper surface of sound continuous rock. Core boring procedures are required to determine the character and continuity of refusal materials.

Representative portions of the split tube samples were placed in sample containers and transported to our laboratory. In the laboratory, the samples were examined and the visual classification was confirmed by a geotechnical engineer or geologist.

The final boring records represent our interpretation of the contents of the field records based on the results of the engineering examinations and testing of selected field samples. These records depict subsurface conditions at the specific locations and at the particular time drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in changes in the ground water conditions at these boring locations. The lines designating the interface between strata on the re3cords and on profiles represent approximate boundaries. The transition between materials may be gradual. The final boring records are included with this report.

A record of the sampling operations and the descriptions of the soils encountered in each boring are shown on the following Soil Boring Record sheets.

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

SOIL TYPE	BLOWS PER FOOT (bpf)[1]	RELATIVE DENSITY / CONSISTENCY DESCRIPTION
SANDS and GRAVELS	0 – 4	Very Loose
	5 - 10	Loose
	11 - 20	Firm
	21 - 30	Very Firm
	31-50	Dense
	Over 50	Very Dense
SILTS and CLAYS	0 – 1	Very Soft
	2 – 4	Soft
	5 – 8	Firm
	9 - 15	Stiff
	16-30	Very Stiff
	31-50	Hard
	Over 50	Very Hard

[1] Standard Penetration Resistance blow count, N, which is equal to the sum of the second and third six-inch increments of the SPT test.

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LABORATORY TESTING PROCEDURES

SOIL CLASSIFICATION

Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply his past experience to current problems. In our evaluations, samples obtained during drilling operations are examined in our laboratory and visually classified by an engineer or geologist. The soils are classified according to consistency (based on number of blows from standard penetration tests), color and texture. These classification descriptions are included on our "Soil Boring" records.

The classification system discussed above is primarily qualitative. For detailed soil classification, two laboratory tests are routinely performed: grain size tests and Atterberg limits tests. Using these test results, the soil can be classified according to the AASHTO or Unified Classification Systems (ASTM D-2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in the report.

WATER LEVEL READINGS

Water table readings are normally taken in conjunction with borings and are recorded on the "Soil Boring Records". These readings indicate the approximate location of the hydrostatic water table at the time of our field exploration. Where relatively impervious soils (clayey soils) are encountered, the amount of water seepage into the boring is small, and it is generally not possible to establish the location of the hydrostatic water table through water level readings. The ground water table may also be dependent upon the amount of precipitation at the site during a particular period of time. Fluctuations in the water table should be expected with variations in precipitation, surface run-off, evaporation and other factors.

The time of boring (TOB) water level reported on the boring records is determined by field crews immediately after drilling. Additional water table readings may be obtained at least 24 hours after the borings are completed. The time lag of at least 24 hours is used to permit stabilization of the ground water table which has been disrupted by the drilling operations. The readings are taken by dropping a weighted line down the boring or using an electrical probe to detect the water level surface.

Occasionally, the borings will cave-in, preventing water level readings from being obtained or trapping drilling water above the caved-in zone. The cave-in depth is often measured and recorded on the boring records.

SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-1**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 356.0 ft
Water Level: 20.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		GRAVEL Approx. 2" gravel with some organic matter		
		COASTAL PLAIN SEDIMENTS firm to stiff, brown-gray, medium to fine, silty **CLAY (CH)**; sandy	SS-1	8
			SS-2	10
351	5	very stiff, tan-gray, medium to fine, sandy **SILT (ML)**		
			SS-3	24
			SS-4	29
346	10			
		firm to very firm, white-purple, coarse to fine, clayey **SAND (SC)**; silty		
			SS-5	14
341	15			
			SS-6	21
336	20			
		PARTIALLY WEATHERED ROCK very dense, tan-white, coarse to fine, silty **SAND (SM)**	SS-7	>> 50/4
331	25			
			SS-8	>> 50/3
326	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Screen and Grit Structure
T.W.(S.) Elevation - 352.67 ft
Top of Bottom Slab Elevation - 336.25 ft

GEOTECH 150874.210 GROVETOWN WPCP.GPJ GEC.GDT 1/12/16

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-2**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 353.0 ft
Water Level: NGWE at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Symbol	Soil Description	Sample Type	Standard Penetration Test Data (blows/ft) 0 10 20 30 60 80	N-Value
			TOPSOIL Approx. 3" topsoil	SS-1		15
			COASTAL PLAIN SEDIMENTS firm, tan-brown, coarse to fine, clayey **SAND (SC)**; silty			
			firm, tan-white, coarse to fine, clayey **SAND (SC)**; silty	SS-2		16
348	5		stiff, gray, medium to fine, sandy **SILT (MH)**; w/ mica			
				SS-3		12
				SS-4		14
343	10					
			dense, white-gray, coarse to fine, clayey **SAND (SC)**; silty			
				SS-5		45
338	15					
			firm, white-gray, coarse to fine, clayey **SAND (SC)**; silty, w/ rock			
				SS-6		20
333	20					
			very dense, white-gray, coarse to fine, silty **SAND (SM)**			
				SS-7		72
328	25					
				SS-8		77
323	30		**BORING TERMINATED AT 30.0 ft**			

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Raw Sewage Pump Station
T.W.(S.) Elevation - 353.00 ft
Top of Bottom Slab Elevation - 334.50 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-3**
	Project No: 150874.210
Location: **See Boring Location Plan**	GS Elevation: 427.0 ft
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	Drilling Date: December 16, 2015
Water Level: 4.0 ft at time of boring	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	WOH
		very loose, tan-brown, coarse to fine, clayey **SAND (SC)**; silty		
			SS-2	8
422	5	loose to firm, tan-white, coarse to fine, clayey **SAND (SC)**; silty		
			SS-3	11
			SS-4	14
417	10			
		firm, white, coarse to fine, clayey **SAND (SC)**; silty, w/ rock		
			SS-5	18
412	15			
			SS-6	19
407	20			
		dense, white, coarse to fine, silty **SAND (SM)**		
			SS-7	33
402	25			
			SS-8	38
397	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0, 10, 20, 30, 60, 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sequence Batch Reactor (SBR) #3
T.W.(S.) Elevation - 437.25 ft
Top of Bottom Slab Elevation - 414.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-4**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 433.0 ft
Water Level: 7.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	7
		loose, tan-brown, coarse to fine, clayey **SAND (SC)**; silty	SS-2	8
428	5	firm, tan-pink, coarse to fine, clayey **SAND (SC)**; silty	SS-3	12
		firm, white, coarse to fine, clayey **SAND (SC)**; silty	SS-4	18
423	10		SS-5	15
418	15		SS-6	16
413	20		SS-7	19
408	25		SS-8	20
403	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sequence Batch Reactor (SBR) #1
T.W.(S.) Elevation - 437.25 ft
Top of Bottom Slab Elevation - 414.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-5**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 429.0 ft
Water Level: 7.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
	0	**TOPSOIL**		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	14
		firm, tan-orange, coarse to fine, clayey **SAND (SC)**; silty		
			SS-2	19
424	5	firm to very firm, white, coarse to fine, clayey **SAND (SC)**; silty		
			SS-3	17
			SS-4	18
419	10			
			SS-5	16
414	15			
			SS-6	19
409	20			
			SS-7	20
404	25			
			SS-8	24
399	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sequence Batch Reactor (SBR) Area
T.W.(S.) Elevation - 437.25 ft
Top of Bottom Slab Elevation - 414.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-6**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 425.0 ft
Water Level: 4.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS very soft, tan, coarse to fine, sandy **CLAY (CL)**; silty	SS-1	WOH
			SS-2	WOH
420	5	firm, tan-pink, coarse to fine, clayey **SAND (SC)**; silty	SS-3	13
			SS-4	16
415	10	firm, white, medium to fine, silty **SAND (SM)**	SS-5	18
410	15	dense, tan-white, coarse to fine, clayey **SAND (SC)**	SS-6	41
405	20	**PARTIALLY WEATHERED ROCK** very dense, whitish-tan, coarse to fine, clayey **SAND (SC)**; silty	SS-7	>> 50/6
400	25		SS-8	>> 50/6
395	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sequence Batch Reactor (SBR) #4
T.W.(S.) Elevation - 437.25 ft
Top of Bottom Slab Elevation - 414.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-7**
	Project No: 150874.210
Location: **See Boring Location Plan**	GS Elevation: 430.0 ft
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	Drilling Date: December 16, 2015
Water Level: 6.0 ft at time of boring	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	7
		loose, tan-red, coarse to fine, clayey **SAND (SC)**; silty		
425	5	firm to very firm, tan, coarse to fine, clayey **SAND (SC)**; silty	SS-2	16
			SS-3	19
			SS-4	21
420	10			
		firm to very firm, white, coarse to fine, clayey **SAND (SC)**; silty	SS-5	13
415	15			
			SS-6	17
410	20			
			SS-7	26
405	25			
			SS-8	28
400	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0, 10, 20, 30, 60, 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sequence Batch Reactor (SBR) #2
T.W.(S.) Elevation - 437.25 ft
Top of Bottom Slab Elevation - 414.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-8**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 417.0 ft
Water Level: 2.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	7
		firm, red, coarse to fine, sandy **CLAY (CL)**; silty		
412	5		SS-2	8
		very firm to dense, white, coarse to fine, clayey **SAND (SC)**; silty	SS-3	27
			SS-4	31
407	10			
		very stiff, white, medium to fine, sandy **SILT (MH)**; clayey		
			SS-5	18
402	15			
			SS-6	16
397	20			
		loose to firm, whitish-tan, coarse to fine, clayey **SAND (SC)**; silty		
			SS-7	9
392	25			
			SS-8	12
387	30	**BORING TERMINATED AT 30.0 ft**		

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: UV/Filters/Effluent Pump Station/Plant Pump Station
T.W.(S.) Elevation - 416.17 ft
Top of Bottom Slab Elevation - 397.67 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-9**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 419.0 ft
Water Level: 7.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	25
		very firm, tan-gray, coarse to fine, clayey **SAND (SC)**; silty, with some rocks	SS-2	28
414	5			
		firm to very firm, tan-white, coarse to fine, clayey **SAND (SC)**; silty	SS-3	18
			SS-4	20
409	10			
			SS-5	24
404	15			
		stiff, tan-yellow, coarse to fine, sandy **CLAY (CL)**; silty		
			SS-6	13
399	20			
			SS-7	15
394	25	**BORING TERMINATED AT 25.0 ft**		
389	30			

Standard Penetration Test Data (blows/ft): 0, 10, 20, 30, 60, 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Aerobic Digester
T.W.(S.) Elevation - 431.00 ft
Top of Bottom Slab Elevation - 411.00 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-10**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 422.0 ft
Water Level: 5.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	12
		firm, tan-gray, coarse to fine, clayey **SAND (SC)**; silty		
417	5		SS-2	15
		firm, tan-white, coarse to fine, clayey **SAND (SC)**; silty	SS-3	16
			SS-4	18
412	10			
		very firm, white, coarse to fine, clayey **SAND (SC)**; silty	SS-5	22
407	15			
			SS-6	25
402	20	**BORING TERMINATED AT 20.0 ft**		
397	25			
392	30			

Standard Penetration Test Data (blows/ft): 0, 10, 20, 30, 60, 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Sludge Dewatering
T.W.(S.) Elevation - 424.25 ft
Top of Bottom Slab Elevation - 419.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-11**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 422.0 ft
Water Level: 4.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	13
		firm, tan-gray, coarse to fine, clayey **SAND (SC)**; silty, with some rocks		
			SS-2	16
417	5			
		loose, tan, coarse to fine, clayey **SAND (SC)**; silty	SS-3	7
			SS-4	10
412	10			
		very firm, white, coarse to fine, clayey **SAND (SC)**; silty		
			SS-5	21
407	15			
			SS-6	24
402	20	**BORING TERMINATED AT 20.0 ft**		
397	25			
392	30			

Standard Penetration Test Data (blows/ft): 0, 10, 20, 30, 60, 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Maintenance/Blower Building
T.W.(S.) Elevation - 424.25 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-12**
Location: **See Boring Location Plan**	Project No: 150874.210
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	GS Elevation: 424.0 ft
Water Level: 4.0 ft at time of boring	Drilling Date: December 16, 2015
	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	13
		firm, reddish-gray, coarse to fine, clayey **SAND (SC)**; silty		
			SS-2	17
419	5			
		firm, white, coarse to fine, clayey **SAND (SC)**; silty	SS-3	16
			SS-4	18
414	10			
			SS-5	19
409	15	**BORING TERMINATED AT 15.0 ft**		
404	20			
399	25			
394	30			

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Chemical Structure
T.W.(S.) Elevation - 425.00 ft
Top of Bottom Slab Elevation - 422.33 ft

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SOIL BORING RECORD

Project: **Water Pollution Control Plant - Sewerage System Improvements** Grovetown, Georgia	Boring No: **B-13**
	Project No: 150874.210
Location: **See Boring Location Plan**	GS Elevation: 435.0 ft
Driller/Equipment: J. Daniel / C. Shubert/ CME 45, 2.25" HSA	Drilling Date: December 16, 2015
Water Level: 4.0 ft at time of boring	Engineer/Geologist:

Elevation (ft)	Depth (ft)	Soil Description	Sample Type	N-Value
		TOPSOIL		
		Approx. 12" cultivated soil		
		COASTAL PLAIN SEDIMENTS	SS-1	12
		firm, tan-gray, coarse to fine, clayey **SAND (SC)**; silty		
430	5		SS-2	16
			SS-3	14
		firm, whitish-pink, coarse to fine, clayey **SAND (SC)**; silty		
425	10		SS-4	16
			SS-5	19
420	15	**BORING TERMINATED AT 15.0 ft**		
415	20			
410	25			
405	30			

Standard Penetration Test Data (blows/ft): 0 10 20 30 60 80

- Boring and sampling performed in accordance with ASTM D 1586.
- Depths are measured from existing ground surface at time of drilling.
- Depths are shown to illustrate general arrangements of the strata encountered at the boring location.
- Do not use depths for determinations of quantities or distances.

NOTES: Control Building
T.W.(S.) Elevation - 437.25 ft

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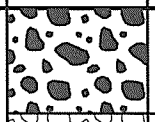
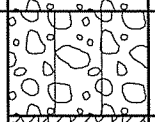
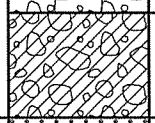
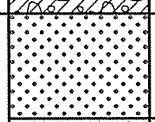
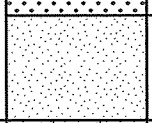
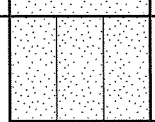
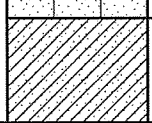
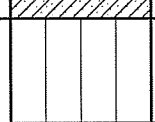
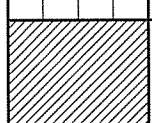
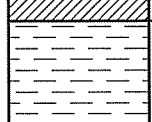
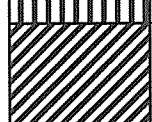
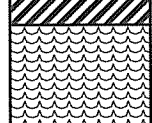
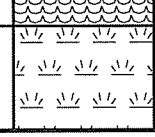
SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS