TWO OAKS DEVELOPMENT, LLC.
3801 MARY TAYLOR ROAD
BIRMINGHAM, ALABAMA 35235

REPORT OF GEOTECHNICAL ENGINEERING EVALUATION FOR PROPOSED NICK DAVIS ROAD SUBDIVISION ATHENS, ALABAMA

PROJECT NO.: 21-1200

DECEMBER 6, 2021

PREPARED BY:

GEO SOLUTIONS L.L.C.
7201 OPPORTUNITY BOULEVARD
HUNTSVILLE, ALABAMA 35810

GEO SOLUTIONS, L.L.C.

Geotechnical Engineering and Materials Testing Services

December 6, 2021

TWO Oaks Development LLC.
3801 Mary Taylor Road
Birmingham, AL. 35235

Attention: Mr. Joseph Winters

Subject: Report of Geotechnical Engineering Evaluation
Proposed Nick Davis Road Subdivision
Limestone County, Alabama
Project No.: 21-1200

INTRODUCTION

As requested, we have completed a geotechnical engineering evaluation for the proposed roadways and residential pads for the proposed Nick Davis Road Subdivision. Our services were performed in general accordance with the requirements of the City of Huntsville Subdivision Regulations. This report presents our findings, conclusions and recommendations relative to the grading and design of the roadway system and residential pads for the proposed subdivision.

EXISTING CONDITIONS

The subject site consists of an open field located south of Nick Davis Road, see the attached Figure 1 for general site location. The site is currently planted with a cover crop. A small portion of the site appears to have been previously graded in the past. This area is located on the north end of the subject site where a structure(s) was previously located. Previous grading appears to have included placement of shallow fill. Some utilities can be assumed to have been installed. The presence of borrow pits, burn pits and unforeseen conditions are highly possible on this site.

PROPOSED CONSTRUCTION

GEO Solutions understands Nick Davis Road Subdivision will include approximately 8,550 linear feet of interior roadways as well as 319 residential lots. The roadways are to be constructed in accordance with the City of Huntsville Subdivision Regulations and Standard Specifications.

SCOPE OF SERVICES

The following services have been performed.

- Review of readily available geologic literature including published geologic maps and USDA soil maps.
- A subsurface exploration consisting of the excavation and logging of soil test pits within the proposed roadways and some residential pads. The test pits were excavated to depths ranging from 3 to 8 feet and included Cone Penetrometer Tests at selected intervals. Test pits were backfilled after excavation.
- Visual classification of soils to help estimate soil index properties.
- Compilation and analysis of the field data.
- Preparation of this report presenting our findings, conclusions and recommendations regarding the subject roadways and residential pads.

SITE GEOLOGY

Review of published geologic maps indicates Fort Payne Chert underlies the site. Fort Payne Chert typically consists of light-olive-gray, thin- to thick-bedded fine- to coarse grained bioclastic (abundant pelmatozoans) limestone containing abundant nodules, lenses and beds of light- to dark-gray chert. Upper part of the formation locally consists of light-bluish-gray laminated siltstone containing vugs lined of filled with quartz and scattered throughout the formation are interbeds of medium- to greenish-gray shale, shaly limestone and siltstone. Commonly present below the Fort Payne chert is a light-olive-gray claystone or shale (Maury Formation) which is mapped with Fort Payne chert. The apparent thickness of the Fort Payne chert in this province varies due to differential dissolution of carbonate in the formation.

Sinkholes have been known to form in areas underlain by the Fort Payne Chert. During our reconnaissance of the site, no features indicative of sinkholes or solution features were noted. In addition, subsurface conditions typically associated with sinkholes were not encountered at the test pit locations.

SOIL SURVEY

Part of this site study included a review of the published soil maps for Limestone County. A copy of the soil map for this site is provided in the attached Figure 2 drawing. Along with the map we have provided a detailed description for each of the major soil types indicated to be present on this site. Soil maps only provide a general indication and location of the possible different soil conditions in the area with some expected variations. Below is a list of the main soil types indicated to be present along with our general opinion as to the suitability of those soils for the use of structural fill and supporting the planned development.

Asv – Abernathy – Bad to Good (Highly Variable)

DbB2 – Decatur – Good

Drd – Dewey – Good

Esv – Etowah – Marginal to Good

Gi – Gutherie – Bad

Hi – Huntington – Marginal to Bad

Hmv – Humphreys Silt – Marginal to Bad

Hru – Humphreys Cherty – Marginal to Good

This report provides more detailed information regarding the attached soil conditions encountered at each test pit location.

SUBSURFACE EXPLORATION

The subsurface exploration included a total of 48 exploratory test pits. The test pits were excavated to depths ranging from 3 to 8 feet. The test pit locations are indicated on Figure 3. The center-line for the proposed roadways were not marked at the time of this review. Test pits included Cone Penetration Tests at selected intervals. An engineer was on site during excavation operations to record and log the results of Cone Penetration Tests and log the test pits.

SUBSURFACE CONDITIONS

The subsurface conditions encountered are summarized in the following sections. For a more detailed description at each pit location, see the attached Summary of Soil Conditions.

Surface Cover

A surface cover consisting of topsoil and organics was encountered at all of the test pit locations. The topsoil thicknesses ranged from 4 to 16 inches thick. Buried topsoil was encountered at only one test pit during our evaluation. The possibility of potentially more buried topsoil cannot be ruled out at this time.

Alluvium

The subject site is flat, low lying and poorly drained. Consequently, soils described as alluvium were encountered in a significant number of the test pits. The characteristics of the alluvium parent soils are very silty and of marginal composition. Because of this, it is sometimes difficult to distinguish the difference between the ancient alluvial soils and marginal to poor quality residual soils. During our review we encountered alluvial soils that are considered marginal and poor.

The poor alluvium is very silty and varied in color from brown, tan and gray. Poor alluvium present is generally soft to very soft and wet.

The marginal alluvial soils consist of a silt clay to clay silt and range in color from a brown to brownish red. Typically these soils are considered weak and risky relative to construction. However, penetrometer readings indicated these alluvial soils are generally firm in their undisturbed state. Therefore, they are considered marginal with regards to the planned residential construction.

Marginal Residuum

On portions of this site the test pits encountered upper residual soils that are very silty but firm. These soils consist of silty clay and some clayey silt and are similar to the marginal alluvium previously discussed. The color of these soils ranges from brown, brownish red and reddish brown.

Stiff Residuum

Each of the test pits were terminated in soils that are considered to be stiff residuum. Those soils generally consist of silt clay with chert. Penetrometer readings indicate these soils are generally firm to very stiff. Colors of the residuum vary from reddish brown to a mottled tan, gray, orangish red and brown. Some of the residual soils became very cherty and difficult to excavate at about 4 to 5 feet below the exposed surface. Very dense chert layers are possible in this geologic formation.

Refusal

Equipment refusal was not encountered at any of the test pit locations to the depths explored. However, the presence of very dense chert, pinnacled limestone rock or limestone boulders cannot be ruled out in deeper utility excavations. **Review of the borings provided to us from the previous MTA Engineers Geotechnical study on this site did show multiple encounters of augur refusal on portions of the site ranging from 6 to 14 feet below the existing surface.**

Groundwater

Groundwater levels were checked during the excavation of the test pits. Due to safety concerns, the test pits were backfilled after excavation. Groundwater was not encountered at any of the test pit locations to the depths explored. Typically, we would expect to find ground water below where the alluvial soils are present. However, we anticipate groundwater will not have a significant impact on mass grading.

Groundwater levels can fluctuate with time and are influenced by several factors including geology, recent precipitation and other factors. Groundwater could be encountered at depths not found in the test pits. In order to further evaluate groundwater conditions at the site, the installation and monitoring of piezometers would be required.

RECOMMENDATIONS

The following recommendations are presented for consideration on the subject project:

Site Preparation/Subgrade Preparation

Site preparation should include the removal of topsoil and surface vegetation. Based on the topsoil encountered at the test pit locations, we anticipate topsoil stripping will range from 4 to 16 inches. Site preparation should extend at least 5 feet beyond the back of the curb and residential pad limits. In deep fill areas, it may be possible to reduce topsoil stripping depths. Further field review would be required.

In areas where marginal and poor soils are indicated, we recommend attempts be made to minimize disturbance to the deeper soils. Stripping in the marginal and poor soil areas should only be done during a period when soil conditions are dry. Traffic paths should be limited to yard areas as much as possible. Following topsoil stripping, a variation of soil conditions will be exposed. Each of the different conditions expected to be present are discussed below. Refer to the attached Summary of Soil Conditions for locations of each of the conditions discussed below.

Poor Alluvial Soils – Shaded in Red

Very soft, wet and silty soils described as poor alluvium was encountered beneath the topsoil layer and in some of the test pits below the marginal alluvium. In areas where these soils will be exposed after topsoil stripping, grading or are near the surface after cutting to grade, we anticipate these soils will likely require undercutting and replacement with structural fill. These soils will not be suitable for reuse as structural fill. This will apply to both residential pads and roadways. Where the marginal alluvium will be left in place and in areas where fill is required, we recommend further evaluating these areas prior to removing the topsoil layer. There may be options that can be implemented and allow the poor alluvial soils to remain in place especially in residential pad areas. Special care and methods may be required by the site grading contractor to make these options work.

Marginal Alluvium and Residual Soil – Shaded in Yellow

At the time of this study these soils generally were found to be firm in their undisturbed state. However, because these soils are very silty, they will generally break down and become unstable when disturbed from things like construction traffic. Deterioration will be exacerbated when soil conditions are wet (above optimum moisture content). Consequently, we recommend site grading operations be done carefully and only when soils are dry (typically late summer and fall). At this time, we anticipate these undisturbed soils will provide adequate support for some but not all residential structures although it is preferred that they be capped with 1 to 2 feet of select structural fill. For roadways we anticipated a minimum of 2 feet of select structural fill will be required to provide a stable road subgrade.

In areas where poor alluvial soils are present beneath the marginal alluvium, it is very likely remedial work will be required unless significant (3 feet or more) fill depths are planned. Remedial work will likely involve undercutting and replacement with structural fill. Further evaluation of these areas will be required when site stripping begins.

The referenced soils in this section are a mixture of, clay silt, ML and very silty clay, CL. Due to the high silt content and moisture sensitivity, these types of soils typically are considered to be poor to marginal with respect to the use of structural fill. Where these soils are cut it may be possible to reuse them as structural fill in residential pad areas. However, extra effort will be required by the site contractor to moisture condition and maintain those soils near optimum moisture content. Some of these soils may be considered as unsuitable for the use as structural fill and should be only used in yard areas. To be successful in using these soils earthwork is recommended when soils are dry which is typically late summer and fall. As previously stated, it is preferred that these soils be capped with 1 to 2 feet of select structural fill.

Stiff Residual Soil – Shaded in Green

A large number of test pits encountered firm to very stiff clay and cherty clay soils below the topsoil. In general, these soils are considered suitable to support the planned residential pads and roadways when at or near optimum moisture content. In addition, these residual soils are generally considered to be satisfactory for use as select structural fill. In deeper cuts the residual soils in some areas contain abundant chert. In a few of the test pits, very stiff to hard cherty clay soils were encountered that were more difficult to excavate with our excavator. In excavations and cut areas deeper than 5 to 10 feet below ground surface, there is the potential to encounter very dense chert layers that may impact grading and require additional effort to remove. If encountered during site grating operations, rippers or other measures may be required to loosen the material. If encountered in utility trenches, a rock hammer may be needed to achieve designed grades. **Review of the borings provided to us from the previous MTA Engineers Geotechnical study on this site did show multiple encounters of augur refusal on portions of the site ranging from 6 to 14 feet below the existing surface.**

Subgrade Review

After a roadway or residential pad has been stripped or excavated to finish soil subgrade, before any fill is placed, the exposed subgrade should be scarified and compacted in place to at least 95 percent of AASHTO T-99. The subgrade should then be thoroughly proofrolled with a fully loaded dump truck. Areas which exhibit pumping and/or rutting may require undercutting to expose stiff soil. The resulting excavation should then be backfilled to finish soil subgrade with properly placed and compacted select soil fill.

Site Degradation during Construction

The upper soils are fine-grained and very sensitive to moisture variations. They will quickly break down if wet and subjected to heavy construction equipment traffic, such as grading operations during inclement weather. It is imperative that rubber-tired earth work equipment not be allowed back on the site until the exposed soils have had adequate time to dry. In some instances, several days may be required. If the contractor returns to the site prior to allowing the soils to dry, it has been our experience that the soil will quickly break down, resulting in severe pumping and rutting.

If subgrade areas become disturbed, additional effort on the contractor's part will be required to repair soft, wet soils. This additional effort could include the removal of disturbed upper soils to facilitate grading activities. Alternatively, when soil moisture is not too high, wet soils could be disked, dried and compacted in place.

Previous Development and Grading

Arial images of this site indicate a structure was previously located on the north end of the site. The gravel driveways are still in place. Test pit TP-35 encountered fill soils and a concrete foundation in the area of the demolished structure. Further evaluation of this area is recommended. It is common to find fill soils, foundations, utilities, septic tanks, septic lines, trash pits, buried trees, buried structures, basements, burn pits and etc. It is likely that some or all of these items could be uncovered beneath this respread topsoil and fill. In other areas of the site, it appears some grading has occurred to help control drainage and water runoff. In addition, some clearing may have occurred. It is not uncommon to encounter unforeseen conditions such as buried trees, filled in ditches or ponds, terraces, and etc. Any suspect areas found during grading should be further evaluated.

Detention Pond Area

Test pit TP-48 was excavated in the general area of the indicated detention pond area. Below the topsoil, this test pit encountered marginal alluvial and silty residual soils extending to 5½ feet below the ground surface. The residual soils below this level were found to be saturated and cherty clay. Heavy groundwater was encountered at this level. If this area is to be excavated to produce fill for the site, dewatering measures will be required. The soils from about 1½ to 5½

feet will produce marginal fill for residential pads as discussed in the section entitled "Marginal Alluvial and Residuum Soils". The soils below these layers will provide better quality of fill but will be saturated and require significant dewatering and drying measures.

Generating Select Structural Fill

Due to the characteristics of alluvial soils and marginal residual soils on this site, it will be more difficult to generate select structural fill for use on this site. Consequently, we recommend meeting with the civil design team to discuss the site conditions prior to designing the grading plan for this site. Having our input prior to designing will help them maximize the use of on-site soils and provide a better estimate of quantities for topsoil, undercut, backfill, non-structural fill, marginal fill and select structural fill.

Existing Utilities

Some existing utilities are likely present on this site where the previous structure(s) have been removed. Utilities should be reviewed further to determine the exact locations with regards to the planned residential pads, roadways and utilities. Removal will likely be required for some areas. Further review will be required to determine if utilities can be abandoned in place.

Excavations

Deeper excavations associated with utility excavations are possible. It is our opinion mass excavations associated with the cuts and undercutting can be accomplished with dozers, scrapers and track-mounted excavators. Note: dense hard chert may be encountered in deeper cuts which may be difficult to excavate and require a rock hammer or other means to establish grades.

Utility excavations deeper than 4 feet and in which workers will enter should either be braced or laid back in accordance with OSHA requirements. At this time, we anticipate a 1(H):1(V) temporary construction slope should be adequate. However, the final slope configuration should be selected by the geotechnical engineer-of-record based on his observations in the field.

Fill Placement

We recommend silty clay, CL for fill be free of organic matter and debris, rocks greater than 3 inches, and composed of soils which meet the City of Huntsville specifications. Visual classification indicate the upper onsite residual soils will typically meet the City of Huntsville Specifications.

If fill has to be imported to the site, we request at least a 72-hour notice. This will allow us time to obtain samples of the fill and perform the necessary laboratory tests. Fill should not be imported to the site without first being approved by the geotechnical engineer-of-record or his representative.

Fill placement and compaction should be monitored by the geotechnical engineer-of-record or his representative. The purpose of this observation is to document the fill is being placed, spread and compacted in a relatively uniform and consistent manner.

An engineering technician from our firm should perform a sufficient number of in-place field density tests to determine whether the grading contractor has obtained proper compaction and the moisture content is within the specified range. The testing frequency should be in accordance with City of Athens Specifications.

Soil fill should be placed in 8-inch loose lifts and compacted to the following percentages of AASHTO-99, Standard Proctor.

ROADWAY LIMITS
Top 6 inches – 100 percent
Below 6 inches – 95 percent

Fill soils should be aerated or moistened, as necessary, to achieve a moisture content from –3 to +3 percent of the Standard Proctor Optimum at the time of compaction. The contractor should acknowledge that both compaction and soil moisture content requirements must be met.

Backfilling of storm drains and utility trenches is often accomplished in an uncontrolled manner leading to subsequent settlement of the fill and cracking of overlying pavements. Utility trench backfill should be placed in controlled lifts and consolidated in-place. Utility trenches in roadway areas should be backfilled with ALDOT No. 78 Stone and capped with 12 inches of compacted ALDOT 825B.

Surface Drainage

The control of surface water and drainage along the roadways during construction and particularly during grading will have a significant impact on the project. The fine-grained soils encountered at the site are moisture sensitive and will be adversely affected by surface water that is allowed to enter the subgrade. We recommend project specifications include provisions for controlling surface water in the construction area.

At the approach of inclement weather, the subgrade should be sloped to drain and sealed to the best extent possible. Areas that "bird bath" should be drained or pumped dry. Heavy equipment should not be allowed back on the area until it has adequately dried.

The time of year earthwork occurs will have a significant impaction on site grading. The silty soils, encountered across the site will break down quickly if wet and subjected to construction equipment traffic.

Pavement Section

While traffic data was not available for the roadways, we understand there will be some truck traffic, especially during home construction. Truck traffic after construction is expected to include garbage trucks, moving trucks, school buses, etc. Based on our understanding to date, the following Standard City of Athens pavement section is proposed.

Neighborhood Roadways

1" Bituminous Concrete Wearing (ALDOT 424A)
2" Bituminous Concrete Binder (ALDOT 424B)
6" Aggregate Base (ALDOT 825, Type B)

Assuming the pavement subgrades are prepared as recommended by the geotechnical engineer-of-record, and maintained, it is our opinion; the proposed pavement section will perform satisfactorily.

The pavement subgrade should be reevaluated (proofrolled) just prior to placement of the section components. Aggregate base stone should be compacted to 100 percent of AASHTO T-99. Further, after passing density tests have been obtained, the base should be proofrolled and thickness checks performed.

LIMITATIONS OF REPORT

This report has been prepared for the exclusive use of TWO Oaks Development, LLC and their designer, for specific application to the project previously discussed. If other parties wish to rely on this report for other than informational purposes, they may do so by executing our standard terms and conditions upon written request.

Our recommendations have been prepared using generally accepted standards of geotechnical engineering practice in the State of Alabama. No other warranty is expressed or implied. This company is not responsible for the conclusions, opinions or recommendations of others based on this data.

Our recommendations are based on the design information furnished to us, the data obtained from the previously described subsurface exploration and our past experience. They do not

reflect variations in the subsurface conditions, which are likely to exist between our soil test pits and in unexplored portions of the site due to the inherent variability of the subsurface conditions in this geologic region as well as previous site usage. If such variations are found during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon onsite observations of the conditions.

CLOSURE

We appreciate this opportunity to be of service and look forward to working with you during the construction of this phase of the project. If you have any questions, please call.

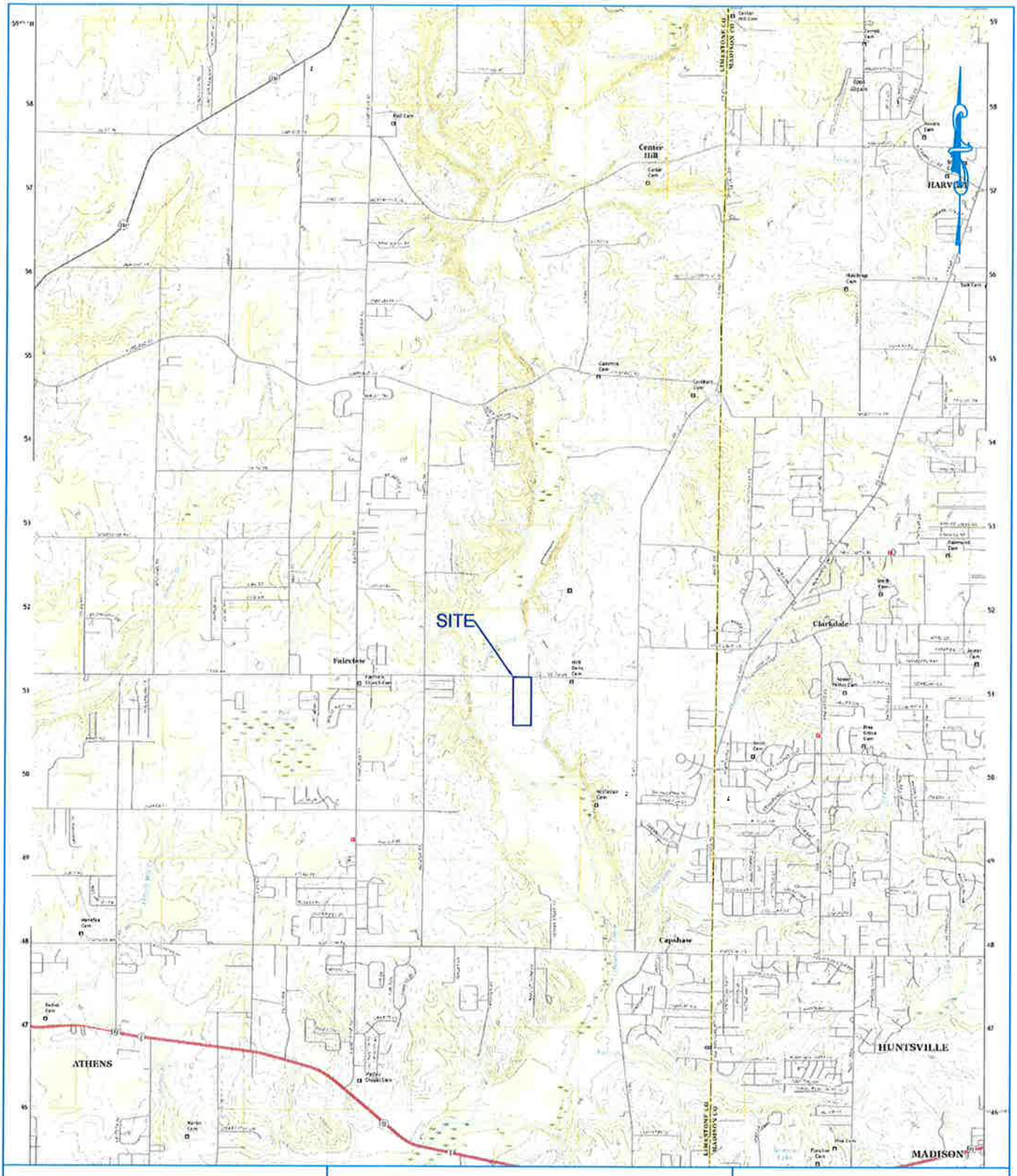
Respectfully submitted,
GEO Solutions, L.L.C.

Brian K. Cook
Partner

William T. Kennard, P.E.
Partner

Distribution: (1) Addressee
(1) Brett Owens, TWO Oaks Development, LLC

Attachments: Figures 1, 2 and 3
Summary of Soil Conditions



NICK DAVIS ROAD
SUBDIVISION
HARVEST, ALABAMA

FIGURE 1

SITE LOCATION PLAN

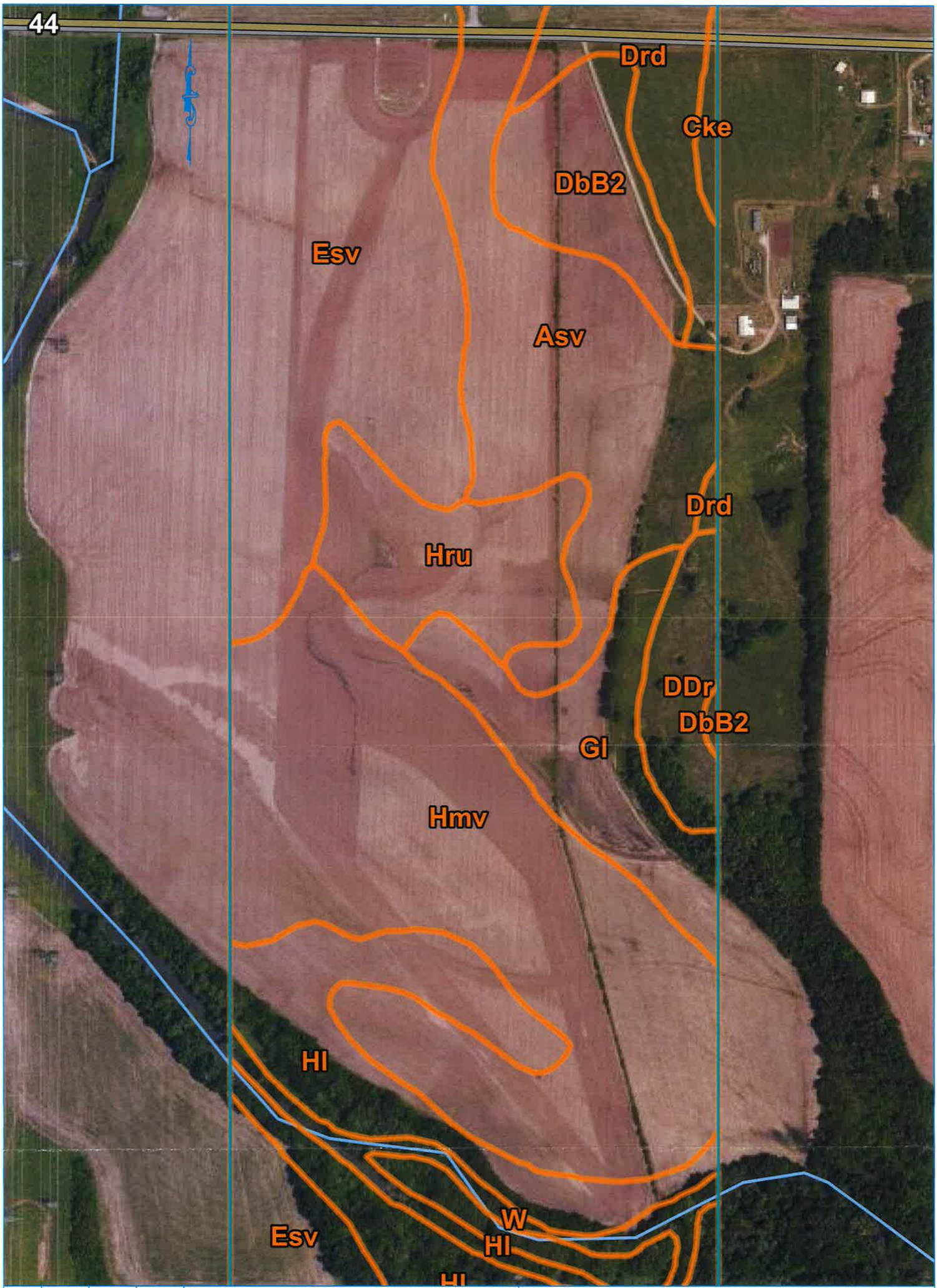
GEO SOLUTIONS, L.L.C.
Geotechnical Engineering and Materials Testing Services

7201 Opportunity Boulevard
Huntsville, Alabama 35810
PH (256)837-6708 FX (256)837-6702

SCALE: 1:2500

PROJ: 21-1200

DATE: NOV. 27, 2021



2 OF 3

DATE: NOV. 27, 2021

PROJ: 21-1200

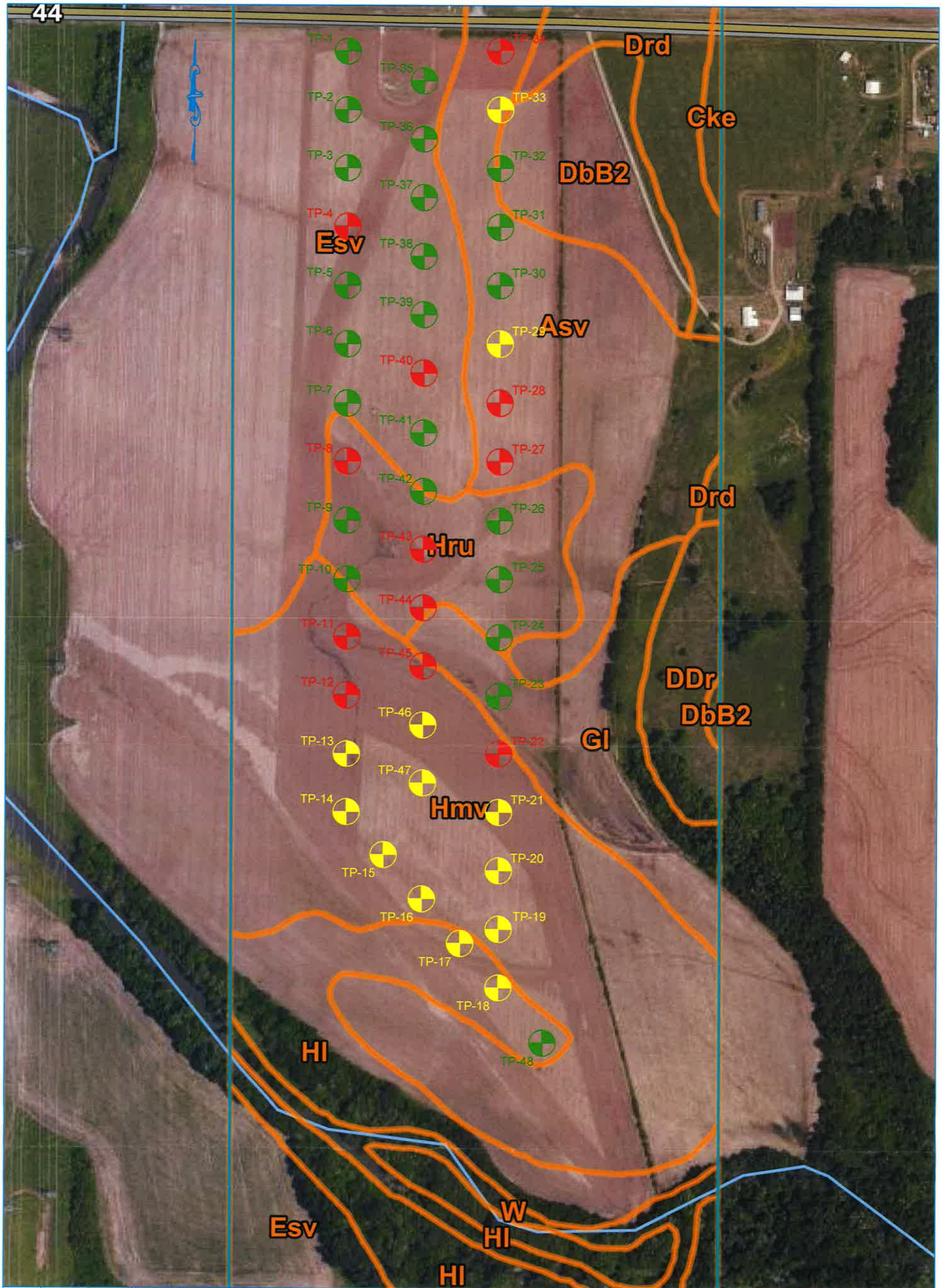
SCALE: NOT TO SCALE

GEO SOLUTIONS, L.L.C.
Geotechnical Engineering and Materials Testing Services

7201 Opportunity Boulevard
Huntsville, Alabama 35810
PH (256)837-6708 FX (256)837-6702

NICK DAVIS ROAD SUBDIVISION HARVEST, ALABAMA

FIGURE 2
SOILS MAP



3 OF 3

DATE: NOV. 27, 2021

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NICK DAVIS ROAD SUBDIVISION HARVEST, ALABAMA

FIGURE 3
TEST PIT LOCATION

Limestone County, Alabama

Asv—Abernathy-Emory silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sr8q
Elevation: 480 to 1,070 feet
Mean annual precipitation: 50 to 65 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 195 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Abernathy and similar soils: 60 percent
Emory and similar soils: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Abernathy

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Alluvium over residuum weathered from limestone

Typical profile

Ap - 0 to 7 inches: silt loam
Bw - 7 to 16 inches: silt loam
2Ab - 16 to 35 inches: silt loam
2Btb - 35 to 65 inches: silty clay loam
2Btxb - 65 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 63 to 72 inches to fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.02 to 0.60 in/hr)
Depth to water table: About 30 to 39 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C

Hydric soil rating: No

Description of Emory

Setting

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Alluvium derived from limestone over residuum weathered from limestone

Typical profile

Ap - 0 to 8 inches: silt loam
Bw - 8 to 31 inches: silt loam
2Ab - 31 to 42 inches: silty clay loam
2Btb - 42 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Hydric soil rating: No

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

DbB2—Decatur silty clay loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wc2q
Elevation: 560 to 950 feet
Mean annual precipitation: 46 to 65 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 180 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Decatur and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Decatur

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone

Typical profile

Ap - 0 to 7 inches: silty clay loam
Bt1 - 7 to 24 inches: silty clay loam
Bt2 - 24 to 80 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Hydric soil rating: No

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Drd—Dewey cherty silty clay loam severely eroded rolling phase

Map Unit Setting

National map unit symbol: kjz7
Elevation: 560 to 890 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dewey and similar soils: 85 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dewey

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 15 inches: gravelly silty clay loam
H2 - 15 to 19 inches: gravelly silty clay loam
H3 - 19 to 90 inches: gravelly clay

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Lee

Percent of map unit: 1 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Esv—Etowah silt loam level phase

Map Unit Setting

National map unit symbol: kjzr
Elevation: 620 to 1,200 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Etowah and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Etowah

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 38 inches: silty clay loam
H3 - 38 to 70 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Chenneby, ponded

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Gl—Guthrie silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2sr88
Elevation: 560 to 920 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 180 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Guthrie and similar soils: 90 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Guthrie

Setting

Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty alluvium derived from sedimentary rock

Typical profile

A - 0 to 8 inches: silt loam
Eg - 8 to 32 inches: silt loam
Btx1 - 32 to 53 inches: silt loam
Btx2 - 53 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 18 to 36 inches to fragipan
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 7 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Ooltewah (chenneby ponded)
Percent of map unit: 4 percent
Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

HI—Huntington silt loam

Map Unit Setting

National map unit symbol: kjzz
Elevation: 560 to 850 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Huntington and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huntington

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 38 inches: silt loam
H3 - 38 to 52 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: NoneRare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Chenneby, ponded

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Hmv—Humphreys silt loam level phase

Map Unit Setting

National map unit symbol: kk00
Elevation: 560 to 850 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Humphreys and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Humphreys

Setting

Landform: Stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone and shale

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 38 inches: silt loam
H3 - 38 to 52 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Chenneby, ponded

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Hmv—Humphreys silt loam level phase

Map Unit Setting

National map unit symbol: kk00
Elevation: 560 to 850 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Humphreys and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Humphreys

Setting

Landform: Stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone and shale

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 38 inches: silt loam
H3 - 38 to 52 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Chenneby, ponded

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Limestone County, Alabama

Hru—Humphreys cherty silt loam undulating phase

Map Unit Setting

National map unit symbol: kk01
Elevation: 560 to 840 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Humphreys and similar soils: 85 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Humphreys

Setting

Landform: Stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone and shale

Typical profile

H1 - 0 to 10 inches: gravelly silt loam
H2 - 10 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneRare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Chenneby, ponded

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Limestone County, Alabama
Survey Area Data: Version 13, Sep 15, 2021

Summary of Soil Conditions						
Test Pit No.	Topsoil Thickness (in)	Depth to Bottom of Alluvium (ft)		Depth to Residuum (ft)		Remarks
		Marginal	Poor	Marginal	Stiff	
TP-1	16	---	---	1.33	3.0	---
TP-2	12	---	---	1.0	3.0	Clay w/ Chert
TP-3	12	---	---	---	1.0	Clay w/ Chert
TP-4	12	---	2	2	3	Clay w/ Chert
TP-5	12	---	---	---	1.0	Clay w/ Chert
TP-6	12	---	---	---	1.0	Clay w/ Chert
TP-7	16	---	---	---	1.33	Clay w/ Chert
TP-8	16	---	4.0	---	4.0	Clay w/ Chert
TP-9	6	---	---	---	0.5	Clay w/ Chert
TP-10	8	---	---	---	0.67	Clay w/ Chert
TP-11	8	---	3.0	---	3.0	Clay w/ Chert
TP-12	16	---	4.5	---	4.5	Clay w/ Chert
TP-13	12	4	---	---	4.0	---
TP-14	12	3.0	---	---	3.0	---
TP-15	12	2.0	---	---	2.0	---
TP-16	12	3.0	---	---	3.0	---
TP-17	12	2.0	---	---	2.0	---
TP-18	12	3.0	---	---	3.0	---
TP-19	12	2.0	---	---	2.0	---
TP-20	12	4.0	---	---	4.0	---
TP-21	12	4.0	---	---	4.0	---
TP-22	12	2.0	3.5	---	3.5	Clay w/ Chert
TP-23	12	---	---	---	1.0	Clay w/ Chert
TP-24	3	---	---	---	1.0	Abundant Chert
TP-25	8	---	---	---	0.67	Abundant Chert
TP-26	4	---	---	0.33	1.0	---
TP-27	4	1.0	2.0	---	2.0	---
TP-28	4	1.0	3.0	---	3.0	---
TP-29	8	1.5	---	1.5	2.5	---
TP-30	12	---	---	---	1.0	---
TP-31	6	---	---	0.5	3.0	---
TP-32	12	---	---	---	1.0	Abundant Chert
TP-33	8	2.0	---	2.0	4.0	---
TP-34	6	1.5	5.5	---	5.5	---
TP-35	6	---	---	---	1.5	Fill w/ Concrete footing
TP-36	16	---	---	1.33	5.0	---
TP-37	12	---	---	1.0	2.5	---

Summary of Soil Conditions (Continued)						
Test Pit No.	Topsoil Thickness (in)	Depth to Bottom of Alluvium (ft)		Depth to Residuum (ft)		Remarks
		Marginal	Poor	Marginal	Stiff	
TP-38	12	---	---	---	1.0	---
TP-39	16	---	---	---	1.33	Clay w/ Chert
TP-40	16	2.0	3.0	---	3.0	Clay w/ Chert
TP-41	12	---	---	1.0	3.0	---
TP-42	12	---	---	---	1.0	---
TP-43	12	2.0	3.0	---	3.0	---
TP-44	12	2.5	4.5	---	4.5	---
TP-45	12	2.0	2.5	2.5	3.0	---
TP-46	12	3.0	---	---	3.0	---
TP-47	12	4.0	---	---	4.0	---
TP-48	16	4.0	---	4.0	5.5	Clay w/Abundant Chert at 5½' Groundwater

Good Test Pits: 1-3, 5-7, 9, 10, 23-26, 30-32, 35-39, 41, 42

Bad Test Pits: 4, 8, 11, 12, 22, 27, 28, 34, 40, 43-45

Marginal Test Pits: 13-21, 29, 33, 46, 47

Pond: 48