

## **Appendix 3**

### **S&EC Preliminary Soils Evaluation Report**



## Soil & Environmental Consultants, PA

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April 19, 2010  
S&EC Project # 11418.G1

Pittsboro Fire Department  
Attn: Mr. Brian Shaw  
P.O. Box 573  
Pittsboro, NC 27312

Re: Preliminary Soil Series Evaluation at the Proposed Pittsboro Fire Station, 3-Acre Site – Chatham County, NC

Dear Mr. Shaw:

Soil & Environmental Consultants, PA (S&EC) performed a preliminary soil series evaluation on the above referenced tract. This was performed as part of the request for services to address the Environmental Assessment activities as related to the permitting process for this site. S&EC's fieldwork was performed during April 2010.

S&EC traversed the property and observed landforms (slope, drainage patterns, past use, etc.) as well as soil conditions (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) through the use of hand auger borings. From these observations, an evaluation of the site, relative to identifying the soil series, was developed. This site is located in the Slate Belt Region of Chatham County, NC. The upland soils on this tract are similar to the Cid, Lignum and Herndon soil series. These soil series have a silt loam surface material over a clay subsoil. Attachment 1 are copies of the typical profile descriptions of these soil series for reference.

Figure 1 (USGE Map) shows the subject property and the general drainage patterns of this area. Elevations vary slightly across the site with the highest elevation being approximately 370 msl along the ridge top on the southeastern side of the property to 350 msl along the northwestern side of the property. The accompanying soil map (Figure 2) indicates the soil series of this area based on the published Chatham County Soil Survey. The "CmB" units indicate areas of soils which are dominantly the Cid and Lignum Soil Series. However, it is very typical to have small inclusions of other soil series such as Herndon within larger areas of Cid and Lignum soils.

Based on S&EC's knowledge of the Cid and Lignum soils and by reviewing the official soil descriptions, none of these soils are described as being "subject to flooding." These soils generally occur on upland settings. Your project will have no impact on floodplains or floodplain values in the area and there are no identifiable secondary or cumulative impacts to floodplains associated with your project.

S&EC has reviewed the inventory of prime, unique and state important soil types listed in the soil survey for Chatham County. The US Department of Agriculture, defines prime

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farmland as land with the best combinations of soil characteristics for agricultural productions, such as; food, feed, forage, fiber and oilseed crops. Unique farmland is land other than prime farmland that is used for specific high value food and fiber crops such as citrus, tree nuts, olives and other fruits and vegetables. Unique farmland is not based on a national criteria but it has a special combination of soil quality characteristics, growing season, temperature, water holding capacity and other factors needed in crop production. The criteria for statewide importance soil is determined by State agencies, however they are generally soil types that nearly meet the prime farmland or unique farmland criteria. Based on a review of the soil types on this 3.1-acre site and the above categories, the Cid and Lignum soils are listed only as state important soils (see Attachment 2). Therefore your project will have no impacts on prime or unique farmland. Based on the amount of site construction intended for this project, it is S&EC's opinion there are no identifiable secondary impacts associated with the proposed substation.

Soil & Environmental Consultants, PA is pleased to be of service in this matter and we look forward to assisting in any site analysis needs you may have in the future. Please feel free to call with any questions or comments.

Sincerely,



Donald L. Wells  
NC Licensed Soil Scientist



# REPORT FIGURES



Project No. 11418.E1	Figure 1-1:24k USGS Quadrangle Pittsboro Fire Department Site Chatham County, NC		<b>Soil &amp; Environmental Consultants, PA</b> 11010 Raven Ridge Rd. - Raleigh, NC 27614 (919) 846-5900 • (919) 846-9487 Web Page: <a href="http://www.SandEC.com">www.SandEC.com</a>
Project Mgr.: DG			
Scale: 1" = 2000'	Colon and Pittsboro Quadrangles		
3/22/2010			



# **ATTACHMENT 1**

## **Soil Profile Descriptions**

LOCATION CID

NC+VA+SC

Established Series

Rev. CMM:DTK:AG:DTA

02/2003

## CID SERIES

The Cid series consists of moderately deep, moderately well drained or somewhat poorly drained soils on Piedmont uplands. These soils formed in residuum weathered from argillite and other fine-grained metavolcanic rocks. Slope ranges from 0 to 15 percent. Mean annual precipitation is 45 inches and mean annual temperature is 60 degrees F. near the type location.

**TAXONOMIC CLASS:** Fine, mixed, semiactive, thermic Aquic Hapludults

**TYPICAL PEDON:** Cid silt loam on a 3 percent side slopes -- forested. (Colors are for moist soil unless otherwise stated.)

**A--O** to 6 inches; grayish brown (10YR 5/2) silt loam; light gray (10YR 7/2) dry; moderate medium granular structure; very friable; many fine roots; 5 percent by volume slate channers; very strongly acid; clear wavy boundary. (2 to 8 inches thick)

**E--6** to 12 inches; light yellowish brown (2.5Y 6/4) silt loam; few fine faint brownish yellow (10YR 6/6) mottles; moderate medium granular structure; friable; common fine and medium roots; common fine pores; 5 percent by volume slate channers; very strongly acid; gradual wavy boundary. (0 to 8 inches thick)

**Bt1--12** to 19 inches; brownish yellow (10YR 6/6) silty clay loam; moderate medium angular blocky structure; friable slightly sticky, slightly plastic; few faint clay films on faces of peds; few fine roots; common fine pores; common medium distinct pale yellow (2.5Y 7/4) iron depletions; very strongly acid; gradual wavy boundary.

**Bt2--19** to 26 inches; olive yellow (2.5Y 6/6) silty clay; moderate medium angular blocky structure; firm, sticky, plastic; few medium roots; common fine pores; common distinct clay films on faces of peds; 5 percent by volume slate channers; common medium faint brownish yellow (10YR 6/6) masses of iron accumulation and common medium distinct light gray (10YR 7/1) iron depletions; very strongly acid; gradual wavy boundary. (Combined thickness of the Bt horizons is 10 to 20 inches)

**BC--26** to 29 inches; olive yellow (2.5Y 6/6) channery silty clay; weak medium subangular blocky structure; firm, sticky, plastic; few medium roots; 25 percent by volume slate channers; common medium distinct gray (10YR 6/1) iron depletions; very strongly acid; gradual wavy boundary. (0 to 6 inches thick)

**Cr--29** to 34 inches; weathered moderately fractured argillite; thin seams of gray (10YR 6/1) silt loam in fractures.

**R--34** inches; unweathered slightly fractured argillite.

**TYPE LOCATION:** Davidson County, North Carolina; 4.2 miles west of Denton on Flat Swamp

Road; 0.5 miles north on N.C. Highway 8; 1/3 miles north on Shiptontown Road (State Road 2310); 100 feet west in pine forest.

**RANGE IN CHARACTERISTICS:** Solum thickness and depth to hard bedrock ranges from 20 to 40 inches. This soil is extremely acid to strongly acid unless limed. Content of coarse fragments, mainly channers, is 0 to 35 percent in the A and E horizons, 0 to 15 percent in the BA, BE, and Bt horizons, and 5 to 35 percent in the BC and BCg horizons.

The A or Ap horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 4. It is silt loam, loam, or very fine sandy loam in the fine earth fraction.

The E horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 2 to 4. It is silt loam, loam, or very fine sandy loam in the fine earth fraction.

The BA or BE horizon, where present, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8. It is silt loam, loam, or silty clay loam.

The Bt horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8, or is mottled in these colors. Redoximorphic accumulations in shades of red, brown, or yellow may be present. Redoximorphic depletions with chroma of 2 or less are within 24 inches of the upper boundary of this horizon. The Bt horizon is silty clay loam, silty clay, clay loam, or clay.

The BC horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8. Redoximorphic accumulations in shades of red, brown, or yellow and redoximorphic depletions in shades of gray, brown, and yellow are in most pedons. Texture is silty clay, silty clay loam, or clay in the fine earth fraction.

The BCg horizon, where present, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Redoximorphic accumulations in shades of red, yellow, and brown are present. Texture is silty clay, silty clay loam, or clay in the fine earth fraction.

The BCtg horizon, where present, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Redoximorphic accumulations in shades of red, yellow, and brown are present. Texture is silty clay, silty clay loam, or clay in the fine earth fraction.

The C horizon, where present, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8. Redoximorphic accumulations in shades of red, brown, or yellow and redoximorphic depletions in shades of gray, brown, and yellow are in some pedons. Texture is silt loam, silty clay loam, or loam saprolite in the fine earth fraction.

The Cr horizon is weathered fractured argillite or other fine-grained metavolcanic bedrock.

The R horizon is unweathered, fractured argillite or other fine-grained metavolcanic rock.

**COMPETING SERIES:** These are the Annemaine, Bush River (T), Craven, Creedmoor, Dogue, Eulonia, Gritney, Helena, Lignum, Mandale (T), Nemours, Nevarc, Newco, Prosperity (T), Rosenwall, Sacul, Stapp, Vinita, and Wolftever soils. Annemaine, Craven, Dogue, Eulonia, Gritney, Nemours, Nevarc, and Wolftever soils formed in marine sediments or alluvium and lack bedrock within a depth of 80 inches. Creedmoor soils have higher exchangeable aluminum and does not have bedrock within a depth of 40 inches. Helena soils are very deep. Lignum soils have a depth to soft bedrock of 40 to 60

inches. Mandale (T) soils have a depth to bedrock of greater than 60 inches. Newco and Stapp soils have red colors in the Bt horizon. Rosenwall, Sacul, and Vinita soils are underlain by shale or sandstone and contain fragments of those rocks.

**GEOGRAPHIC SETTING:** Cid soils are on undulating to gently sloping interstream divides, on lower side slopes, or on broad flats around the heads of drainageways on the uplands. Slope gradients are commonly 2 to 6 percent but range from 0 to 15 percent. These soils formed in residuum weathered from argillite and other fine-grained metavolcanic rocks. Mean annual precipitation is about 45 inches, and the mean annual temperature is about 60 degrees F. near the type location.

**GEOGRAPHICALLY ASSOCIATED SOILS:** These are the competing Lignum and Mandale (T) series and the Alamance, Badin, Callison, Georgeville, Goldston, Herndon, Kirksey, Misenheimer, Montonia, Nanford, Nason, Oakboro, Secrest, Tarrus, and Tatum soils. Alamance, Badin, Georgeville, Goldston, Herndon, Nanford, Nason, Tarrus, and Tatum soils are well drained. Alamance, Callison, Kirksey, Montonia, and Secrest soils have less than 35 percent clay in the Bt horizon. In addition, Kirksey soils have a depth to hard bedrock of 40 to 60 inches and Secrest soils have a depth to soft bedrock of 40 to 60 inches. Goldston and Misenheimer soils have loamy horizons less than 20 inches deep over a paralithic contact. Oakboro soils have less clay and are on flood plains.

**DRAINAGE AND PERMEABILITY:** Moderately well drained and somewhat poorly drained; slow to moderate runoff, slow permeability. This soil has a perched water table, 1.0 to 2.5 feet below the surface in the winter and spring.

**USE AND VEGETATION:** Used mostly for forest with minor acreage in pasture, crops, or idle. Woodland consists primarily of shortleaf pine, loblolly pine, Virginia pine, southern red oak, white oak, willow oak, sweetgum, red maple, flowering dogwood, American holly, blackgum, post oak, black oak, scarlet oak, and eastern red cedar. Crops grown include corn, soybeans, small grains, and hay.

**DISTRIBUTION AND EXTENT:** North Carolina, Virginia, and South Carolina. The series is of moderate extent.

**MLRA OFFICE RESPONSIBLE:** Raleigh, North Carolina

**SERIES ESTABLISHED:** Davidson County, North Carolina; 1985.

**REMARKS:** This series was formerly included with the Lignum series. It differs mainly in having hard bedrock between depths of 20 to 40 inches.

Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - the zone from the surface of the soil to a depth of 12 inches (A and E horizons)

Argillic horizon - the zone from approximately 12 to 26 inches below the surface (Bt1 and Bt2 horizons)

Paralithic contact - the occurrence of soft, fractured bedrock at a depth of 29 inches (the upper boundary of the Cr horizon)

Lithic contact - the occurrence of hard fractured bedrock at a depth of 34 inches (the upper boundary of the R horizon)

MLRA = 136

SIR = NC0189

**ADDITIONAL DATA:**

**TABULAR SERIES DATA:**

SOI-5	Soil Name	Slope	Airtemp	FrFr/Seas	Precip	Elevation
NC0189	CID	0-15	59-64	190-230	37-60	350-600

SOI-5	FloodL	FloodH	Watertable	Kind	Months	Bedrock	Hardness
NC0189	NONE		1.0-2.5	PERCHED	DEC-MAY	20-40	HARD

SOI-5	Depth	Texture	3-Inch	No-10	Clay%	-CEC-
NC0189	0-12	SIL L VFSL	0-5	80-100	10-25	2-7
NC0189	0-12	CN-SIL CN-L CN-VFSL	0-10	50-80	10-25	2-7
NC0189	12-26	SICL SIC C	0-5	80-100	35-60	7-13
NC0189	26-29	CN-SIC CN-SICL SIC	0-10	60-100	35-60	7-13
NC0189	29-34	WB	-	-	-	-
NC0189	34	UWB	-	-	-	-

SOI-5	Depth	-pH-	O.M.	Salin	Permeab	Shnk-Swll
NC0189	0-12	3.5-5.5	.5-2.	0-0	0.6-2.0	LOW
NC0189	0-12	3.5-5.5	.5-2.	0-0	0.6-2.0	LOW
NC0189	12-26	3.5-5.5	0.-.5	0-0	0.06-0.2	MODERATE
NC0189	26-29	3.5-5.5	0.-.5	0-0	0.06-0.2	MODERATE
NC0189	29-34	-	-	-	-	-
NC0189	34	-	-	-	-	-

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National Cooperative Soil Survey  
U.S.A.

LOCATION LIGNUM

NC+GA SC VA

Established Series  
Rev. NBP; DTA  
02/2010

## LIGNUM SERIES

Soils of the Lignum series are deep and moderately well and somewhat poorly drained. They formed in the residuum weathered from Carolina slate or other fine grained metavolcanic rocks. Slopes range from 0 to 15 percent. Mean annual precipitation is about 41 inches and mean annual air temperature is about 57 degrees F.

**TAXONOMIC CLASS:** Fine, mixed, semiactive, thermic Aquic Hapludults

**TYPICAL PEDON:** Lignum silt loam - woods. (Colors are for moist soil.)

A--0 to 2 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary. (4 to 10 inches thick)

E--2 to 12 inches; very pale brown (10YR 7/3) silt loam; weak fine granular structure; friable; few fine and medium roots; few fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; clear wavy boundary. (0 to 8 inches thick)

Bt1--12 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; strong medium angular blocky structure; firm, slightly sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; common fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2--16 to 35 inches; yellowish brown (10YR 5/4) silty clay; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; common distinct clay films on faces of peds; common coarse prominent strong brown (7.5YR 5/8) masses of iron accumulations and common medium distinct light gray (10YR 7/2) iron depletions; very strongly acid; gradual wavy boundary. (Combined thickness of the Bt horizon is 16 to 36 inches)

BCg--35 to 39 inches; light brownish gray (10YR 6/2) silty clay loam; weak fine subangular blocky structure; friable; many coarse prominent strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary. (0 to 18 inches thick)

C--39 to 56 inches; mottled light gray (10YR 7/2), strong brown (7.5YR 5/8), and very pale brown (10YR 8/2) silt loam saprolite; massive; friable; very strongly acid; abrupt smooth boundary.

Cr--56 to 65 inches; moderately hard, weathered bedrock.

**TYPE LOCATION:** Moore County, North Carolina; 10.1 miles southwest of Robbins on North Carolina Highways 24 and 27, about 1.4 miles north on Secondary Road 1281 from its intersection with North Carolina Highways 24 and 27, about 30 feet west of Secondary Road 1281, in a pine forest.

**RANGE IN CHARACTERISTICS:** Solum thickness is 20 to 40 inches. Depth to a paralithic contact

of weathered bedrock (Cr) is 40 to 60 inches. Depth to a lithic contact of unweathered bedrock (R) is more than 60 inches. Silt content is more than 40 percent and generally more than 50 percent in the upper part of the solum. Rock fragments of quartz or slate range from 0 to 25 percent in the A and E horizons, 0 to 15 percent in the BE, B, and BC horizons, and 0 to 50 percent in the C horizon with more than 30 percent restricted to the lower part of the C horizon. The soil is very strongly acid or strongly acid throughout, except where surface layers have been limed.

The A or Ap horizon has hue of 7.5YR through 2.5Y, value of 4 through 7, and chroma of 1 through 4. It is silt loam, loam, or very fine sandy loam in the fine-earth fraction.

The E horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 1 through 6. It is loam, silt loam, or very fine sandy loam in the fine-earth fraction.

The BA or BE horizon, where present, has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 3 through 8. It is loam, silt loam, clay loam, or silty clay loam in the fine-earth fraction.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 3 through 8. Hue of 2.5Y is restricted to thin individual subhorizons. Iron or clay depletions and accumulations in shades of gray, yellow, brown, and red are present in most pedons. The Bt horizon is silty clay loam, silty clay, clay loam, or clay in the fine-earth fraction.

The Btg horizon, where present, has hue of 7.5YR through 2.5Y, or is neutral, value of 5 through 7, and chroma of 0 to 2. Iron or clay accumulations in shades of yellow, brown, and red are present in most pedons. It is silty clay loam, silty clay, clay loam, or clay in the fine-earth fraction.

The BC or CB horizon, where present, has hue of 7.5YR through 5Y, value of 5 through 7, and chroma of 3 through 8. Iron or clay depletions and accumulations in shades of gray, white, yellow, brown, and red are present in most pedons. Texture is loam, silt loam, clay loam, or silty clay loam in the fine-earth fraction.

The BCg or CBg horizon has hue of 7.5YR through 5Y, or is neutral, value of 5 through 7, and chroma of 0 or 2. Iron or clay accumulations in shades of yellow, brown, and red are present in most pedons. Texture is loam, silt loam, clay loam, or silty clay loam in the fine-earth fraction.

The C horizon colors are variable and commonly do not have a dominant color. Iron depletions and accumulations in shades of gray, yellow, brown, and red may be present. Texture is very fine sandy loam, silty clay loam, or silt loam saprolite in the fine-earth fraction.

The Cg horizon, where present, has hue of 7.5YR through 2.5Y, or is neutral, value of 5 through 7, and chroma of 0 to 2. Iron accumulations in shades of yellow, brown, and red may be present. Texture is very fine sandy loam, silty clay loam, or silt loam saprolite in the fine-earth fraction.

The Cr horizon is weathered, moderately hard, and slightly to moderately fractured argillite or other fine grained metavolcanic rock.

**COMPETING SERIES:** These are the Annemaine, Bush River, Cid, Creedmoor, Dogue, Gritney, Helena, Mandale (T), Prosperity, and Wolftever series in the same family. Annemaine soils formed in stratified clayey and loamy sediments on marine or stream terraces in the coastal plain and have a depth to bedrock of greater than 60 inches. Bush River, Helena, and Prosperity soils formed in residuum from mixed felsic, intermediate, or mafic igneous high-grade rocks. Cid soils have a depth to paralithic

contact of 20 to 40 inches. Creedmoor soils formed in Triassic Basin sediments and have a depth to bedrock of greater than 60 inches. Dogue and Wolfvever soils have a depth to bedrock of greater than 60 inches and are located on low stream terraces. Gritney soils formed in coastal plain sediments and have a depth to bedrock of greater than 60 inches. Mandale (T) soils have a depth to bedrock of greater than 60 inches.

**GEOGRAPHIC SETTING:** Lignum soils are in depressions and on undulating uplands, in interstream divides, and around the heads of drainageways. Slope gradients are commonly 2 to 6 percent with a range of 0 to 15 percent. They formed in residuum weathered from argillite or other fine grained metavolcanic rocks. The mean annual air temperature is about 57 degrees F., and mean annual precipitation ranges from 38 to 45 inches.

**GEOGRAPHICALLY ASSOCIATED SOILS:** These are the competing Cid and Mandale soils as well as the Alamance, Badin, Callison, Georgeville, Goldston, Gundy, Herndon, Kirksey, Misenheimer, Montonia, Nanford, Secrest, and Tarrus soils. Alamance, Badin, Georgeville, Goldston, Gundy, Herndon, Montonia, Nanford and Tarrus soils are well drained. Kirksey soils have a fine-silty particle size control section and a depth to hard bedrock of 40 to 60 inches. Misenheimer and Goldston soils are loamy and less than 20 inches to a paralithic contact. Secrest soils have a fine-silty particle size control section and a depth to soft bedrock of 40 to 60 inches.

**DRAINAGE AND PERMEABILITY:** Moderately well and somewhat poorly drained, moderate to slow runoff; very slow permeability.

**USE AND VEGETATION:** Used largely for forest with minor acreage in pasture. A small acreage is cultivated or idle. Crops include corn, soybeans, small grain and hay grasses. Vegetation consists of white, black, red and scarlet oaks, red maple, blackgum, dogwood, and loblolly pine.

**DISTRIBUTION AND EXTENT:** North Carolina, South Carolina, and Virginia. The series is of moderate extent.

**MLRA OFFICE RESPONSIBLE:** Raleigh, North Carolina

**SERIES ESTABLISHED:** Culpeper County, Virginia, 1948. This area is now in the mesic piedmont area. Lignum soils were moved to a thermic area in Moore County, North Carolina. A new mesic counterpart will be established.

**REMARKS:** Diagnostic horizons and features recognized in this pedon are:  
a. Ochric epipedon - the zone from 0 to 12 inches (A and E horizons).  
b. Argillic horizon - the zone from 12 to 39 inches (Bt and BCgt horizons).  
c. Paralithic contact--the presence of weathered bedrock at 56 inches.

SIR = VA0011

MLRA = 136

REVISED = 7/5/93, MHC; 12/04/97, DTA; 07/15/00, DTA

**ADDITIONAL DATA:**

**TABULAR SERIES DATA:**

SOI-5	Soil Name	Slope	Airtemp	FrFr/Seas	Precip	Elevation
VA0011	LIGNUM	0-15	59- 66	175-225	38-55	150- 550

SOI-5	FloodL	FloodH	Watertable	Kind	Months	Bedrock	Hardness
VA0011	NONE		1.0-2.5	PERCHED	DEC-MAY	40-60	SOFT

SOI-5	Depth	Texture	3-Inch	No-10	Clay%	-CEC-
VA0011	0-12	SIL L VFSL	0-0	80-100	10-25	-
VA0011	12-39	SICL SIC C	0-5	75-100	35-55	-
VA0011	39-56	SCL GR-SCL GR-SICL	0-15	35- 80	20-40	-
VA0011	56-65	WB	-	-	-	-

SOI-5	Depth	-pH-	O.M.	Salin	Permeab	Shnk-Swll
VA0011	0-12	4.5-5.5	.5-2.	0- 0	0.6- 2.0	LOW
VA0011	12-39	4.5-5.5	0.-.5	0- 0	0.0-0.06	MODERATE
VA0011	39-56	4.5-5.5	0.-.5	0- 0	0.2- 0.6	LOW
VA0011	56-65	-	-	-	-	-

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National Cooperative Soil Survey  
U.S.A.

LOCATION HERNDON

SC+AL GA NC VA

Established Series  
Rev. DJD  
11/2007

## HERNDON SERIES

The Herndon series consists of very deep, well drained, moderately permeable soils that formed in material mostly weathered from fine-grained metavolcanic rock of the Carolina Slate Belt. Slopes are 2 to 25 percent.

**TAXONOMIC CLASS:** Fine, kaolinitic, thermic Typic Kanhapludults

**TYPICAL PEDON:** Herndon silt loam--forested. (Colors are for moist soil.)

**A--**0 to 3 inches; very dark grayish brown (2.5Y 3/2) silt loam; weak fine granular structure; friable; many fine roots, few medium and coarse roots; 2 percent quartz gravel; very strongly acid; clear smooth boundary. (0 to 9 inches thick)

**E--**3 to 9 inches; pale olive (5Y 6/4) silt loam; weak fine granular structure; friable; many fine roots, few medium and coarse roots; 2 percent quartz gravel; few fine brown concretions; strongly acid; clear smooth boundary. (0 to 9 inches thick)

**BE--**9 to 14 inches; pale yellow (2.5Y 7/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine, medium and coarse roots; 1 percent quartz gravel; strongly acid; clear smooth boundary. (0 to 6 inches thick)

**Bt1--**14 to 25 inches; yellowish brown (10YR 5/8) silty clay; few fine and medium distinct olive yellow (2.5Y 6/8) mottles, moderate medium subangular blocky structure; friable; few medium and coarse roots; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

**Bt2--**25 to 39 inches; strong brown (7.5YR 5/6) clay; few fine prominent reddish yellow (5YR 6/8) and few fine distinct brownish yellow (10YR 6/6) mottles; firm, hard; few medium and coarse roots; few dark brown concretions; few faint clay films on faces of peds; 1 percent fragments of partially weathered rock; very strongly acid; clear wavy boundary.

**Bt3--**39 to 48 inches; reddish yellow (7.5YR 7/8) silty clay loam; few fine prominent very pale brown (10YR 7/3), yellowish red (5YR 5/8), and olive yellow (5Y 6/8), and few fine faint strong brown (7.5YR 5/8) mottles; moderate fine and medium subangular blocky structure; few faint clay films mostly on vertical faces of peds; 1 percent quartz gravel; very strongly acid; clear wavy boundary. (Combined thickness of the Bt horizon ranges from 24 to 48 inches thick)

**C--**48 to 68 inches; strong brown (7.5YR 5/8), yellowish red (5YR 5/8), red (2.5YR 4/6), very pale brown (10YR 7/4), and very pale brown (10YR 8/2) silt loam; 80 percent saprolite that crushes easily; 10 percent slate channers; very strongly acid.

**TYPE LOCATION:** Saluda County, South Carolina; 8 miles north of Saluda; 1/4 mile south of

Coleman's crossroad on west side of South Carolina Secondary Highway 78.

**RANGE IN CHARACTERISTICS:** Thickness of the clayey part of the Bt horizon ranges from 24 to 48 inches. Depth to the bottom of the clayey Bt horizon exceeds 30 inches. Depth to bedrock (R horizon) is more than 60 inches. The soil is very strongly acid to slightly acid in the A and E horizons and extremely acid to strongly acid in the B and C horizons. Content of rock fragments range from 0 to 35 percent in the A and E horizons, and 0 to 10 percent in the Bt and lower horizons.

The A or Ap horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 8. Horizons with value of 3 are less than 6 inches thick. The A horizon commonly is silt loam, loam, or very fine sandy loam in the fine-earth fraction. In some pedons, the A horizon is silty clay loam or clay loam.

The E horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 3 to 6. It is silt loam, loam, or very fine sandy loam in the fine-earth fraction.

The BE horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 4 to 6. It is silt loam, loam, clay loam, or silty clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. Mottles in shades of brown, yellow, or red are in most pedons. It is silty clay loam, silty clay, or clay. The lower part of the Bt horizon also allows silt loam, loam, or clay loam. Some pedons have relict mottles in shades of gray or white in lower subhorizons. The particle-size control section averages more than 30 percent silt, or more than 40 percent silt plus very fine sand, or less than 15 percent sand coarser than very fine sand.

The BC horizon, where present, has hue of 5YR to 10 YR, value of 4 to 7, and chroma of 4 to 8, or is mottled in shades of these colors. Mottles in shades of brown, yellow, red, gray, or white may occur. It is silt loam, loam, silty clay loam, or clay loam.

The C horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 3 to 8, or is mottled in shades of white, gray, brown, yellow, or red. It is silt loam, loam, very fine sandy loam, silty clay loam saprolite.

**COMPETING SERIES:** These are the Appling, Aragon, Cataula, Cecil, Chestatee, Darley, Georgeville, Hulett, Kolomaki, Mahan, Nanford, Nectar, Neeses, Pacolet, Spotsylvania, Tarrus, and Wedowee series. Appling, Cecil, Hulett, Pacolet, and Wedowee soils have less than 30 percent silt in the control section. Aragon and Nectar soils formed in weathered limestone, sandstone, shale, or siltstone; also, Aragon soils have a Bt horizon that is mottled in the upper part. Cataula and Neeses soils have a layer that is partially dense and brittle. Chestatee soils have more than 15 percent by volume of coarse fragments throughout. Darley soils contain layers of fractured ironstone in the B horizon. Georgeville and Kolomaki soils have a Bt horizon with hue redder than 5YR; also, Kolomaki soils are on terraces on the southern Coastal Plain. Mahan soils formed in coastal plain sediments and have coarse fragments of ironstone. Spotsylvania soils have a lithologic discontinuity.

**GEOGRAPHIC SETTING:** Herndon soils are on gently sloping to moderately steep Piedmont Uplands. Slope gradients generally are 2 to 15 percent but range to 25 percent. The soil formed in residuum weathered from fine-grained metavolcanic rocks of the Carolina Slate Belt. The mean annual temperature ranges from 59 to 66 degrees F., the annual precipitation ranges from 37 to 60 inches, and the frost-free season ranges from 190 to 225 days.

**GEOGRAPHICALLY ASSOCIATED SOILS:** In addition to the competing Georgeville series, these

are Alamance, Badin, Goldston, Gundy, Kirksey, Nanford, and Tarrus series. Alamance and Kirksey soils have a fine-silty particle size control section. Goldston soils are loamy-skeletal. Badin and Gundy soils have mixed mineralogy. Nanford and Tarrus soils have a depth to weathered bedrock of 40 to 60 inches.

**DRAINAGE AND PERMEABILITY:** Well drained; medium runoff; moderate permeability.

**USE AND VEGETATION:** Cleared areas are used primarily for cotton, small grains, corn, tobacco, hay, and pasture. Forested areas are dominantly in loblolly or shortleaf pine with some mixed hardwood.

**DISTRIBUTION AND EXTENT:** Alabama, Georgia, North Carolina, South Carolina, and Virginia. The series is extensive.

**MLRA OFFICE RESPONSIBLE:** Raleigh, North Carolina

**SERIES ESTABLISHED:** Statesville Area, North Carolina; 1901

**REMARKS:** The 1979 revision used the linear relationship between the thickness of the clayey Bt horizon and depth to the bottom of the clayey Bt horizon as series criteria instead of solum thickness. Diagnostic horizons and features recognized in this pedon are:  
 Ochric epipedon - the zone from the surface of the soil to 9 inches (A and E horizons)  
 Argillic horizon - the zone from 9 to 48 inches (BE, Bt1, Bt2, and Bt3 horizons)

MLRA = 136 SIR = SC0017

**ADDITIONAL DATA:**

**TABULAR SERIES DATA:**

SOI-5	Soil Name	Slope	Airtemp	FrFr/Seas	Precip	Elevation
SC0017	HERNDON	2- 25	59- 66	190-225	37- 60	300-1100

  

SOI-5	FloodL	FloodH	Watertable	Kind	Months	Bedrock	Hardness
SC0017	NONE		>6.0		-		>60

  

SOI-5	Depth	Texture	3-Inch	No-10	Clay%	-CEC-
SC0017	0- 9	ST-L ST-SIL ST-VFSL	10- 30	75- 95	5-27	5- 11
SC0017	0- 9	L SIL VFSL	0- 2	85-100	5-27	5- 11
SC0017	0- 9	SICL	0- 2	95-100	27-35	5- 11
SC0017	9-48	SICL SIC C	0- 1	90-100	35-60	8- 12
SC0017	48-68	SIL L FSL	0- 2	85-100	10-27	6- 10

  

SOI-5	Depth	-pH-	O.M.	Salin	Permeab	Shnk-Swll
SC0017	0- 9	4.5- 6.5	.5-1.	0- 0	0.6- 2.0	LOW
SC0017	0- 9	4.5- 6.5	.5-1.	0- 0	0.6- 2.0	LOW
SC0017	0- 9	4.5- 6.5	0.-.5	0- 0	0.6- 2.0	LOW
SC0017	9-48	3.6- 5.5	0.-.5	0- 0	0.6- 2.0	LOW
SC0017	48-68	3.6- 5.5	0.-.5	0- 0	0.6- 2.0	LOW

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National Cooperative Soil Survey  
 U.S.A.

# **ATTACHMENT 2**

## **Table for Prime, Unique and State Important Farmland Chatham County Soil Survey**

## Prime Farmland and Other Important Farmlands

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Map unit name	Farmland classification
CeB	Cecil gravelly sandy loam, 2 to 6 percent slopes	All areas are prime farmland
CrB	Creedmoor-Green Level complex, 2 to 6 percent slopes	All areas are prime farmland
GaB	Georgeville silt loam, 2 to 6 percent slopes	All areas are prime farmland
GbB	Georgeville silt loam, 2 to 8 percent slopes	All areas are prime farmland
GeB2	Georgeville silty clay loam, 2 to 6 percent slopes, moderately eroded	All areas are prime farmland
GhB2	Georgeville silty clay loam, 2 to 8 percent slopes, moderately eroded	All areas are prime farmland
HeB	Helena sandy loam, 2 to 6 percent slopes	All areas are prime farmland
HrB	Herndon silt loam, 2 to 6 percent slopes	All areas are prime farmland
MaA	Mattaponi fine sandy loam, 0 to 2 percent slopes	All areas are prime farmland
MaB	Mattaponi fine sandy loam, 2 to 8 percent slopes	All areas are prime farmland
MdB	Mayodan fine sandy loam, 2 to 6 percent slopes	All areas are prime farmland
NaB	Nanford-Badin complex, 2 to 6 percent slopes	All areas are prime farmland
PcA	Peawick fine sandy loam, 0 to 2 percent slopes, rarely flooded	All areas are prime farmland
PeA	Peawick fine sandy loam, 0 to 2 percent slopes	All areas are prime farmland
PeB	Peawick fine sandy loam, 2 to 8 percent slopes	All areas are prime farmland
StB	State sandy loam, 2 to 6 percent slopes	All areas are prime farmland
TuA	Turbeville fine sandy loam, 0 to 3 percent slopes	All areas are prime farmland
VaB	Vance sandy loam, 2 to 6 percent slopes	All areas are prime farmland
WeB	Wedowee sandy loam, 2 to 6 percent slopes	All areas are prime farmland
BdB	Badin-Tarrus complex, 2 to 8 percent slopes	Farmland of statewide importance
BdC	Badin-Tarrus complex, 8 to 15 percent slopes	Farmland of statewide importance
BeB2	Badin-Tarrus complex, 2 to 8 percent slopes, moderately eroded	Farmland of statewide importance
BeC2	Badin-Tarrus complex, 8 to 15 percent slopes, moderately eroded	Farmland of statewide importance
CaB	Callison-Lignum complex, 2 to 6 percent slopes	Farmland of statewide importance
CeC	Cecil gravelly sandy loam, 6 to 10 percent slopes	Farmland of statewide importance
CeD	Cecil gravelly sandy loam, 10 to 15 percent slopes	Farmland of statewide importance
CkC	Cid silt loam, 6 to 10 percent slopes	Farmland of statewide importance
CmB	Cid-Lignum complex, 2 to 6 percent slopes	Farmland of statewide importance
CrC	Creedmoor-Green Level complex, 6 to 10 percent slopes	Farmland of statewide importance
CrD	Creedmoor-Green Level complex, 10 to 15 percent slopes	Farmland of statewide importance
GaC	Georgeville silt loam, 6 to 10 percent slopes	Farmland of statewide importance
GbC	Georgeville silt loam, 8 to 15 percent slopes	Farmland of statewide importance
GeC2	Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded	Farmland of statewide importance
GhC2	Georgeville silty clay loam, 8 to 15 percent slopes, moderately eroded	Farmland of statewide importance
GkD	Georgeville-Badin complex, 10 to 15 percent slopes	Farmland of statewide importance
HeC	Helena sandy loam, 6 to 10 percent slopes	Farmland of statewide importance
HrC	Herndon silt loam, 6 to 10 percent slopes	Farmland of statewide importance
IrB	Iredell fine sandy loam, 2 to 6 percent slopes	Farmland of statewide importance
McC	Mattaponi-Peawick complex, 8 to 15 percent slopes	Farmland of statewide importance
MdC	Mayodan fine sandy loam, 6 to 10 percent slopes	Farmland of statewide importance
MgD	Mayodan gravelly sandy loam, 10 to 15 percent slopes	Farmland of statewide importance
NaC	Nanford-Badin complex, 6 to 10 percent slopes	Farmland of statewide importance
NaD	Nanford-Badin complex, 10 to 15 percent slopes	Farmland of statewide importance
WeC	Wedowee sandy loam, 6 to 10 percent slopes	Farmland of statewide importance
WeD	Wedowee sandy loam, 10 to 15 percent slopes	Farmland of statewide importance
WhB	White Store-Polkton complex, 2 to 6 percent slopes	Farmland of statewide importance
WhC	White Store-Polkton complex, 6 to 10 percent slopes	Farmland of statewide importance
WhD	White Store-Polkton complex, 10 to 15 percent slopes	Farmland of statewide importance
WtB	Wynott-Enon complex, 2 to 8 percent slopes	Farmland of statewide importance
WtC	Wynott-Enon complex, 8 to 15 percent slopes	Farmland of statewide importance
WyB2	Wynott-Enon complex, 2 to 8 percent slopes, moderately eroded	Farmland of statewide importance