OCCURANCE OF THE HYDRIC SOIL INDICATOR PIEDMONT FLOODPLAIN SOILS (F19) OUTSIDE OF ITS KNOWN RANGE

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LIST OF ABBREVIATIONS

FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
MLRA	Major Land Resource Area
NRCS	Natural Resource Conservation Service
NTCHS	National Technical Committee for Hydric Soils
OBL	Obligate Wetland
UPL	Obligate Upland
US ACOE	United States Army Corps of Engineers

ABSTRACT

OCCURANCE OF THE HYDRIC SOIL INDICATOR PIEDMONT FLOODPLAIN SOILS (F19) OUTSIDE OF ITS KNOWN RANGE

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Hydric soil indicators are regionally specific soil morphologies that allow for field identification of hydric soils without the need for time-consuming instrumentation. On occasion, new indicators are proposed, or existing indicators are expanded to new areas for testing. Hydric soil indicator Piedmont Floodplain Soils (F19) was recently expanded for testing in the southern Piedmont. Indicators in the area require a matrix chroma of 2 or less. F19 requires a chroma of less than 4. It is possible that soils meeting F19 but not other indicators are higher in chroma because they are less reduced. Using F19 for wetland delineation in test areas such as the southern Piedmont could result in upland expansion of wetland boundaries. In this study, F19 was observed in the southern Piedmont. On steep slopes it occurred alongside other indicators but on flat slopes it occurred in higher landscape positions where no other indicator occurred. The use of F19 would therefore expand the extent of hydric soils and therefore wetlands in the flatter areas. Additional research is needed to determine whether the expanded areas that have the F19 indicator meet the definition of hydric soils and the definition of a wetland.

INTRODUCTION

Wetlands help to provide clean water by filtering suspended sediments and removing nutrients from surface and shallow groundwater. It is estimated that in the lower 48 United States there were 89.4 million HA (221 million acres) of freshwater wetlands prior to European settlement (Dahl and Johnson, 1991). Through urban and agricultural expansion the amount of freshwater wetlands had dropped to 41.7 million HA (103 million acres) by 1980 (Dahl, 1990). The 1972 Clean Water Act was passed to protect clean water by protecting wetlands from destruction. In section 404 wetlands are defined as, “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated conditions”.

Identifying and Delineating a Wetland

Wetlands are generally not discrete objects that can be isolated from their surroundings. They are instead the lower portions of landscape continuums. These poorly drained areas collect and hold water which creates the wetland conditions. These conditions are standing water during the wet portions of the year, a predominance of hydrophytic vegetation and hydric soils. Away from the center of the wetland, the land becomes better drained, water is a shallow groundwater table instead of ponded, vegetation can be adapted to both wet and dry conditions, and the soils are less wet. These areas are wetland edges, transitions between wetland and upland areas of the landscape. These transitional areas are where wetland boundaries are meant to be delineated.

Where wetlands occur in areas targeted for development or impact, federal and/or state government agencies regulate development activities as guided by the

Clean Water Act. Prior to any associated decision making by these agencies, the wetlands in consideration must first be identified and delineated. Where wetlands are readily identifiable (i.e. transitional areas are small in extent) this is a straight forward process with little disagreement between the landowner and government agencies regulating land use.

In many cases however, the transitional area can be expansive. It is not abundantly clear where the wetland ends and the upland begins. Water tables may fluctuate greatly from wet to dry season. The plants and soils that occur in these areas will reflect this and display both wet and dry characteristics. Despite this wide transitional zone, a discrete wetland boundary line must be delineated as a first step in the negotiations between the property owner and agency. Since it is not obvious where in the transitional zone to draw the line, a methodology has been established to guide all interested parties to the same line. The presence of hydric soils must be determined as part of that methodology.

Most wetlands fall under the jurisdiction of the US Army Corps of Engineers (ACOE). The ACOE requires that areas within the wetland be vegetated by predominately hydrophytic plants, display some evidence of surface water ponding and support hydric soils (US ACOE, 1987). Non wetlands would thus be areas that do not meet all three of those conditions. An exact extent of wetlands can therefore be delineated as the upland extent where all three of these conditions occur.

Identifying and Delineating the Extent of Hydric Soils

Hydric soils are defined by the United States Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) as “soils that form under conditions of saturation, flooding or ponding long enough during the growing season to develop

anaerobic conditions in the upper part" (Federal Register, 1994). The morphology of hydric soils reflects the wet conditions as various patterns of organic matter accumulation and redistribution of oxidized iron in the upper part of the hydric soils. The specific morphological patterns can change with geography. Some patterns occur across the U.S. while others are limited to certain regions. The USDA-NRCS has developed a set of indicators that, when observed, provide positive evidence that a soil is hydric. As a corollary, soils without a hydric soil indicator are generally thought to be non-hydric. The upland extent of soils meeting at least one hydric soil indicator is considered to be the upland extent of hydric soils.

The hydric soil indicators are published by the USDA-NRCS as the "Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils" (USDA-NRCS, 2010). Each indicator outlines a unique combination of colors and soil textures. Occasionally, some soils that are thought to be hydric yet they will not meet any of the existing hydric soil indicators specified for use in that region. Where this occurs, new hydric soil indicators have been developed and placed in a testing phase. Additionally, an existing indicator from a neighboring region may be identified for testing outside its region.

In the Southern Piedmont region the most commonly used hydric soil indicators are Hydrogen Sulfide (A4), Thick Dark Surface (A12), Depleted Matrix (F3) and Redox Depression (F8) with F3 being utilized over 90 percent of the time (Lathem, 2012). The F3 and A12 indicators require a soil matrix with chroma 2 or less to identify prolonged saturation (Table 1). Using monitoring wells, Vepraskas and Caldwell (2008) concluded that the F3 indicator met hydric soil conditions for 95% of the year studied.

Some hydric soil indicators such as F8 do not require chroma 2 matrix color. F8 is used with soils containing 5% or more distinct or prominent redox concentrations in the upper 6" (USDA-NRCS, 2010). F8 is commonly used in closed depressions subject to ponding like Grady ponds but can occur in backwater depressions on a floodplain (Lawrence, 2013). When a new indicator is used in an area, or an existing one expanded to a new area, it is possible that the upland extent of hydric soils could be expanded. The hydric soil indicator Piedmont Floodplain Soils has recently been expanded for test use into the new areas.

Young Floodplain Soils: Indicator F19 Piedmont Floodplain Soils

F19 occurs in soils with matrix chroma less than 4. It was developed as a result of research conducted on Piedmont floodplains in Maryland (Castenson, 2004). Using monitoring well data and redox potential measurements Castenson concluded that a soil matrix of >60% chroma 3 with prominent redoxomorphic concentrations met hydric soil technical standard (2004). Hydric soil technical standard is prolonged saturation and anaerobic conditions observed for 14 consecutive days. The NTCHS recommends using the hydric soil standard to modify, validate, eliminate, or adopt hydric soil field indicators (NTCHS, 2007).

Floodplain soils occurring in the southern portion of the Piedmont like those of the Mid-Atlantic are young in relative terms. Many of these soils developed in the last 250 years as a result of colluvium and alluvium soil materials becoming deposited over existing floodplain soils. The intense agricultural management practices by European Colonists from the 18th to the early 20th century accelerated erosion to much higher rates than seen today. Much of the top soil that once covered the uplands now lies along the toe slopes and floodplains (Costa, 1975). The age of these young floodplain

soils makes connections between morphology and hydrologic conditions sometimes difficult to establish (Lindbo, 1997). Not enough time has passed to develop morphological changes associated with current anaerobic conditions (Castenson, 2004). Therefore unlike the more common F3 hydric soil indicator, F19 utilizes a matrix chroma of less than 4 to identify prolonged saturation (Table 2 and Table 3). F19 also differs from F3 in that F19 is exempt from the requirement of < 15 cm of material above the indicator with chroma 2 or less (USDA-NRCS, 2010). It is assumed that F19 being developed in the Mid-Atlantic Piedmont will be applicable in the Southern Piedmont. However, no current testing or data on use of F19 in the Southern Piedmont has occurred.

F19 is for use in MLRA 149A and 148 and for testing or use active floodplains subject to Piedmont deposition (USDA-NRCS, 2010). Site selection requires an active floodplain along a river not subject to flood control. An NRCS soil scientist indicated that soils meeting F19 are likely to occur along a large floodplain where slope is shallow and thus transition gradients are broad (Lathem, 2012).

Objective

The objective of this study was to document the occurrence of Piedmont Floodplain Soils (F19) in southern Piedmont landscapes. This location is outside the defined range of F19 but inside the test range.

MATERIALS AND METHODS

Site Selection and Transect Placement

An active floodplain on the Alcovy River in Newton County GA located in the Southern Piedmont was selected for documenting the occurrence of F19. The upper portions of soils were observed in several locations along the western floodplain of the Alcovy River east of Covington (Figure 1). Three transects were established in areas of the floodplain where F19 was expected to occur based on unpublished reports. Transects were oriented perpendicular to slope minimizing transitional gradients. The length of each transect varied since it was based on the transect beginning in the non-hydric area and falling into the middle of a depression containing hydric soils.

Transect Surveying

Transects were traverse surveyed by a professional survey crew using a Leica® 700 Series Total Station. Control points were created between a known benchmark and each shooting location to minimize error. Surveying shots were taken at the beginning and end of each transect and at stations with an average 1 meter interval along each transect. Northing and Easting positions were recorded in the State Plane Coordinate System for Georgia West Zone 1002 using North American Datum 1983. Measurements were originally collected in US survey feet and then converted to meters.

Vegetation Analysis

The dominant vegetation was inventoried along a section encompassing 1 m on either side of the transects. Vegetation was grouped in the four strata recommended by the US ACOE in the Eastern Mountain and Piedmont Region supplement to the Wetland Delineation Manual (US ACOE, 2012). The four strata observed were: 1) tree, 2) sapling/shrub, 3) herbaceous and 4) woody vines. Vegetation was classified to the

species level whenever possible and assistance was provided by a registered forester. The list of vegetation was then cross referenced with the 2012 US ACOE Table of National Wetland Plants to determine wetland indicator status. The five classes were: 1) obligate (OBL), 2) facultative wetland (FACW), 3) facultative (FAC), 4) facultative upland (FACU) and 5) upland (UPL). Obligate vegetation almost always occurs in a wetland with an estimate probability of 99% (US ACOE, 2012). Facultative vegetation is equally likely to occur both in and outside wetlands (US ACOE, 2012). Facultative upland plants usually occur outside of wetlands but have a 1-33% chance of occurring inside a wetland (US ACOE, 2012). The occurrences of each vegetation sample were plotted and a dominant wetland class status determined. The vegetative analysis table is presented in Appendix A.

Soil Pedon Descriptions

At approximately three meter intervals along each transect, the upper 25 cm of soil was excavated using a drain spade shovel. Frequency of descriptions along each transect was increased near areas of abrupt change in elevation so as to capture abrupt changes in soil morphology. Soil textures were estimated by feel. The soil pedons along each transect were described using USDA soil description methods (Schoeneberger et al, 2002). Soil hue, value and chroma readings were taken using a Munsell® Soil Color Chart on moist samples. Soil pedon descriptions were recorded on Detailed Hydric Soil Description Form number 618-1 from the NRCS. Using soil pedon descriptions, the hydric status of the soil was determined using the 2010 NTCHS Field Indicators of Hydric Soil in the United States. Soil pedon descriptions are reported in Appendix B.

Hydrologic Observations

Regional rainfall data collected during the time of study revealed precipitation levels were slightly below to near normal. Along the transects, observations were made over a 30 day period where water remained at or near the soil surface. Observations were made from late February through late March which is considered the early part of the growing season for this region (Lathem, 2012). Station measurements were made for hydrologic observations. Very little fluctuation occurred during the 30 day period. Observations taken over the 30 day period representing the early part of the growing were averaged and plotted along the transects.

Visualization of Soil and Vegetative Stratigraphy

Cross sections of each transect were developed by plotting station distance verses elevation. The same 2 m range is used on the y-axis of each plot to achieve equal vertical exaggeration. Hydric soil status was assigned to each pedon description and plotted by station measurement. The dominant vegetative strata with vegetative wetland indicator status was plotted by station measurement. Observed hydrologic conditions were plotted along the transect. Hydric soil delineations produced by various noted indicators were plotted along the transect.

RESULTS AND DISCUSSION

Transect A

The change in elevation along transect A (Figure 2) was 0.58 m. The pedon described at the 0.25 m station did not meet a hydric soil indicator. The pedon at the 2 m station met F19 only (Table B-8). The horizon meeting F19 had a clay loam texture and a soil matrix chroma of 2 (Table B-8). The remaining seven pedons met F3. There is overlap among hydric soil indicators and two pedons at the lower end of the transect met F3 and F19.

Transect A contained facultative wetland vegetation from the tree stratum throughout. A facultative upland plant from the sapling/shrub stratum was located at station 5.4 m and was observed growing in a slightly elevated position. Facultative plants from the woody vine stratum were observed at stations 8.5 m and 13.8 m. Obligate wetland vegetation in herb stratum begins at station 5.7 m and was continuous to station 11.4 m. The upper extent of the herbaceous obligate vegetation was within 1.2 m of the highest observed pedon meeting F3. Therefore, it is likely that where F3 was observed hydrophytic vegetation will also be present. F19 appears to occur amongst facultative vegetation and higher up the slope than any pedon meeting F3.

The hydrologic observations plotted along the transect (Figure 2) show water was ponded over most of the transect during the early growing season. F19 was observed in a small depression that remained inundated slightly up hill from the highest F3 observation. The hydrologic observations agree with observed hydrophytic vegetation to support the conclusion that the area is a wetland, but further study is needed. A hydric soil delineation using F19 would occur < 2 m up slope in this portion

of the study area compared to a hydric soil delineation using all other observed indicators.

Transect B

Elevation change along transect B (Figure 3) was 0.21 m. Among the eleven pedon descriptions, the four highest in elevation were non-hydric. F19 was met at station 6.7 m through station 24.99 m. At station 18.9 m the pedon contained a horizon meeting F19 with a sandy clay loam texture and a soil matrix chroma of 2 (Table B-16). There were pedons closer to non-hydric soils that met F19 with a soil matrix chroma of 3 and had clay and clay loam textures. The qualifying horizon was a clay loam Bt in four of the seven that met F19, a sandy clay loam BC horizon in two of the seven and a clay Bt in the last.

No obligate vegetation was observed along transect B. All observed vegetation in the tree stratum was facultative and dispersed evenly across the transect. Observed vegetation from the sapling/shrub strata was facultative and facultative upland. Facultative sapling/shrub vegetation was observed across the transect. Facultative upland vegetation was observed growing in soils that were non-hydric as well as soils meeting F19. A moderate amount of rooting from feral pigs was observed throughout this transect. The rooting possibly limited occurrence of herbaceous vegetation but was shallow enough (< 5 cm) that it likely had no effect on hydric soil morphology.

The observed hydrology showed that water was present at or very near the soil surface for 3 weeks during the early growing season. The observed hydrology for this transect suggests that this area is a wetland. F19 was observed among facultative and facultative upland vegetation only. F19 was also observed along a 20 m section of the transect with no other pedons meeting hydric soil indicators. In this portion of the study

area using F19 would result in a hydric soil delineation several meters higher up slope than using other established hydric soil indicators.

Transect C

Elevation change along transect C (Figure 4) was 0.74 m. Among the eight pedon descriptions, the two highest in elevation were non-hydric. Transect C terminates in a closed depression that appears to be an old river slough or oxbow. F8 is for use in closed depressions subject to ponding. F8 was met by having > 5% distinct or prominent redox concentrations in the appropriate landscape position. F8 and F19 were met at station 8.2 m through station 20.4 m. F3 and F8 were met at station 23.5 m. The pedon description at station 17.37 m shows a horizon meeting F19 with a soil matrix chroma of 3 and a clay loam texture (Table B-26). This pedon also had a horizon meeting F8 with 5% or more prominent redox concentration in the upper 15 cm (Table B-26).

Facultative upland vegetation was only observed growing in soils that were non-hydric. Facultative sapling/shrub vegetation was observed from station 0.8 m to just before the first hydric soil pedon at 5.6 m. Obligate herbaceous vegetation was observed sparsely among non-hydric soils at stations 3.7 m and 5.8 m. Obligate herbaceous vegetation was then observed extensively after the first pedon meeting F8 and F19 at station 9.1 m. Obligate vegetation from the tree stratum was observed in the lower portion from stations 17.5 m to 23.8 m. Water Tupelo or *Nyssa aquatica* was the predominant tree that occurred on this transect. A very sharp delineation was made where vegetation changed from being dominated by facultative vegetation to being dominated by obligate vegetation.

Observed hydrology indicates that much of the transect was inundated during the first part of the growing season for at least 30 days. The observed hydrology also agrees with the delineation of dominate facultative and dominant obligate vegetation. In each pedon of transect C, hydric soil indicator F19 was observed concurrently with F3 or F8. For transect C, a hydric soil delineation generated using F19 would not be any different than using F3 or F8.

Landscape Position of Hydric Soil Indicators

Among the commonly used hydric soil indicators for the southern Piedmont (Table 1), Hydrogen Sulfide (A4) and Thick Dark Surface (A12) were not observed. A4 is known to be present when the soil is anaerobic and reduced for extended periods of time. A12 develops where organic matter accumulations largely outpace decomposition. The A4 and A12 indicators would likely be found in wetlands subject to near annual periods of saturation where the F19 indicator appears to be associated with wet season saturation. In the study area, F3 was consistently observed at lower relative elevations than F19. It is possible that pedons meeting F3 were saturated longer than pedons meeting F19. This could be tested with hydrologic and/or redox monitoring.

For loamy and clayey hydric soils, a mineral layer more than 15 cm thick must have dominant chroma of 2 or less except for F8, F12, F19 and F20 (USDA-NRCS, 2010). Thus a soil meeting all requirements for F3 except possessing a layer more than 15 cm thick with a chroma more than 2 would meet F19 if located in a Piedmont floodplain. Similar pedons were observed in the study area along transects A higher than pedons meeting F3 and across transect B. Without F19 these soils would be considered non-hydric.

Hydrophytic Vegetation and F19 Along Transects

In transect A where F3 and F19 were both observed, obligate vegetation was present. F19 also was observed in transect A slightly higher up slope than obligate wetland vegetation and other hydric soil indicators. In transect C where F8 and F19 were observed, obligate vegetation was also present. In transect B where F19 was the only indicator observed at most pedons, only facultative and facultative upland vegetation was present but facultative vegetation was dominant. F19 was observed among both facultative and obligate dominant vegetation in the study area and therefore not exclusive to a dominant type of vegetation.

Slope and F19 Along Transects

The landscape positions where F19 was observed appear related to slope. In transect C which had the steepest slope, F19 occurred concurrently with other hydric soil indicators. The transition in hydrology and vegetation from upland to wetland is very abrupt and lines of delineation are easily visible. In contrast, transect B had a most gradual slope of the three. Delineations for vegetation and hydrology between upland and wetland are more difficult to establish and thus the hydric soil delineation is unclear as well. It appears that on slopes like these, F19 is covering greater spatial area. Transect A contained F19 in a small closed depression higher in elevation than other hydric soil indicators. The overall slope of transect A is somewhat between that of B and C. The area containing F19 was accordingly in between that of B and C. Further study is needed to determine whether F19 is more or less likely to be located on the shallow slopes transitioning between upland and hydric soils.

Conclusions

This study documents that F19 occurs in southern Piedmont landscapes alongside, slightly above and greatly above other hydric soil indicators in the landscape. The extent of F19 appears to depend on slope and wet season saturation. Hydric soil boundaries generated by using F19 may coincide with boundaries using other hydric soil indicators or they may occur further upslope. This evidence in this study suggests that use of F19 in the southern Piedmont would expand hydric soil and thus the extent of delineated wetlands. Hydrologic and redox monitoring would be needed to determine whether the expanded areas are wetlands or uplands.

TABLES

Table 1. Hydric soil indicators commonly used in the Southern Piedmont Floodplain (Lathem, 2012)

Symbol	Name	Description
A4	Hydrogen Sulfide	Presence of a hydrogen sulfide odor within 30cm (12in) of the soil surface
A12	Thick Dark Surface	Presence of a black layer 30cm (12in) or more thick directly above a layer with a matrix (60% or more of the volume) chroma of 2 or less
F3	Depleted Matrix	Presence of a layer with a matrix (60% or more of the volume) chroma 2 or less that is 15cm (6in) thick and starts within 25cm (10in) of the soil surface
F8	Redox Depression	Presence of 5% or more distinct redox concentrations in a layer 5cm (2in) thick and entirely within the upper 15cm (6in) of the soil surface

Table 2. Hydric soil indicator Piedmont Floodplain Soils (F19)

Symbol	Name	Description
F19	Piedmont Floodplain Soils	Presence of a layer at least 15cm (6in) thick starting within 30cm (12in) of the soil surface v a matrix (60% or more of the volume) chroma less than 4 and 20% or more distinct or prominent redox depletions

Table 3. Pedon description from study by Castenson (2004)

				Redox Features						
				Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-7	sil	10YR 4/3	8	3F	7.5YR 4/6	-	-	-	
				2	1P	N2				
BA	7-20	sil	10YR 4/4	10	3F	7.5YR 4/4	-	-	-	
				3	1P	N2				
Bw1	20-41	l	2.5Y 4/3	15	2-3P	7.5YR 4/6	-	-	-	F19
				10	2-3P	7.5YR 5/8				

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicators: F19, Piedmont Flood Plain Soils.

FIGURES

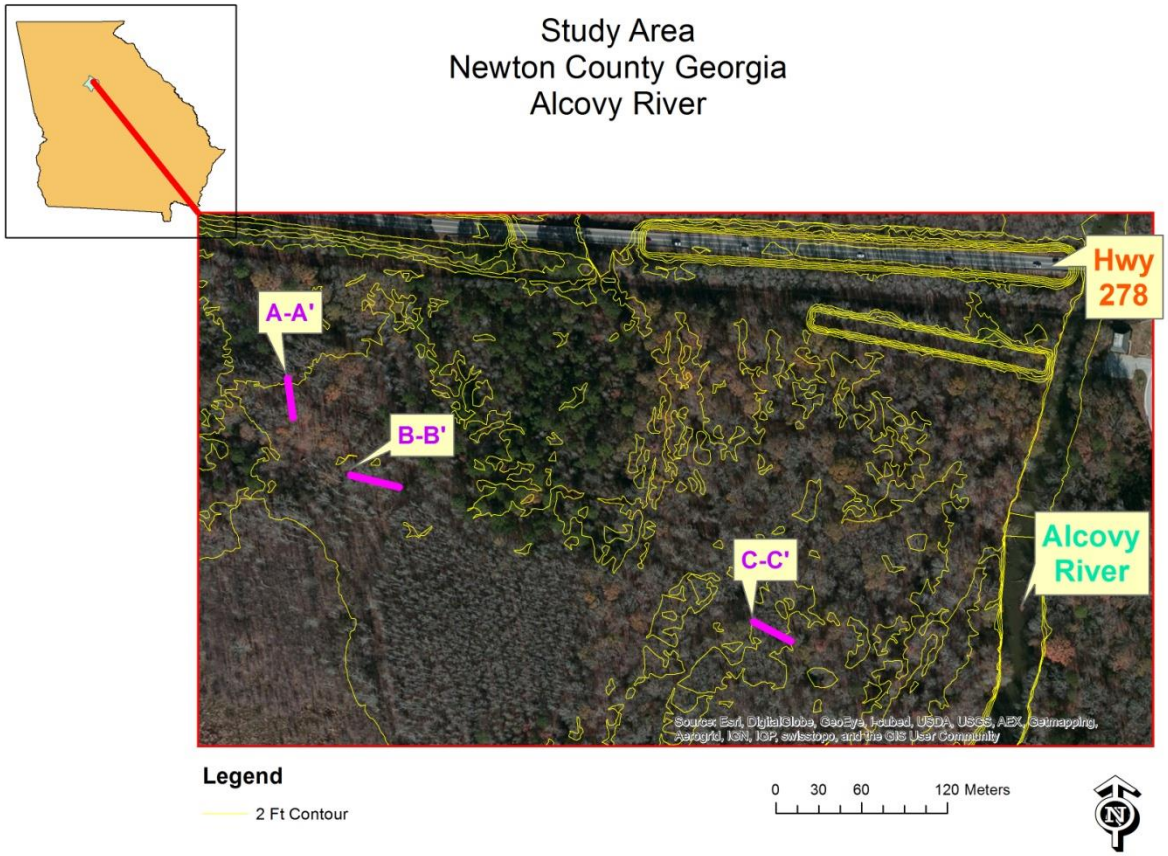

Figure 1. Site location map. Alcovy River located in Newton County Georgia at intersection with U.S. Hwy 278. Two foot contour lines shown in yellow. Transects A, B and C located in the floodplain along western bank of the Alcovy River are shown in purple.

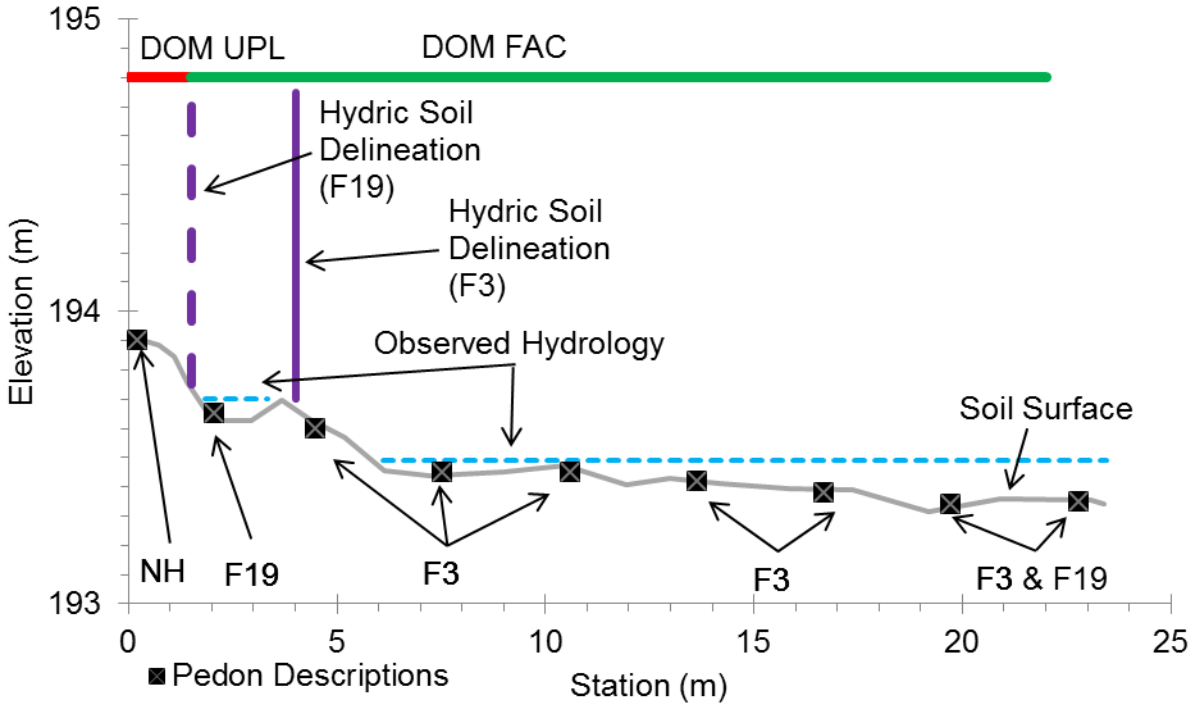

Figure 2. Transect A soil and vegetation. Pedon descriptions were conducted at 3 m intervals along the transect. NH, no hydric soil indicators were met; F19, hydric soil indicator Piedmont Floodplain Soil was met; F3, hydric soil indicator Depleted Matrix was met. Dom UPL, upland vegetation observed to be dominant. Dom FAC, facultative vegetation observed to be dominant. Observed Hydrology, water was present over 2 weeks during first part of growing season. Hydric Soil Delineation, hydric soils delineated using indicators F3 and F19.

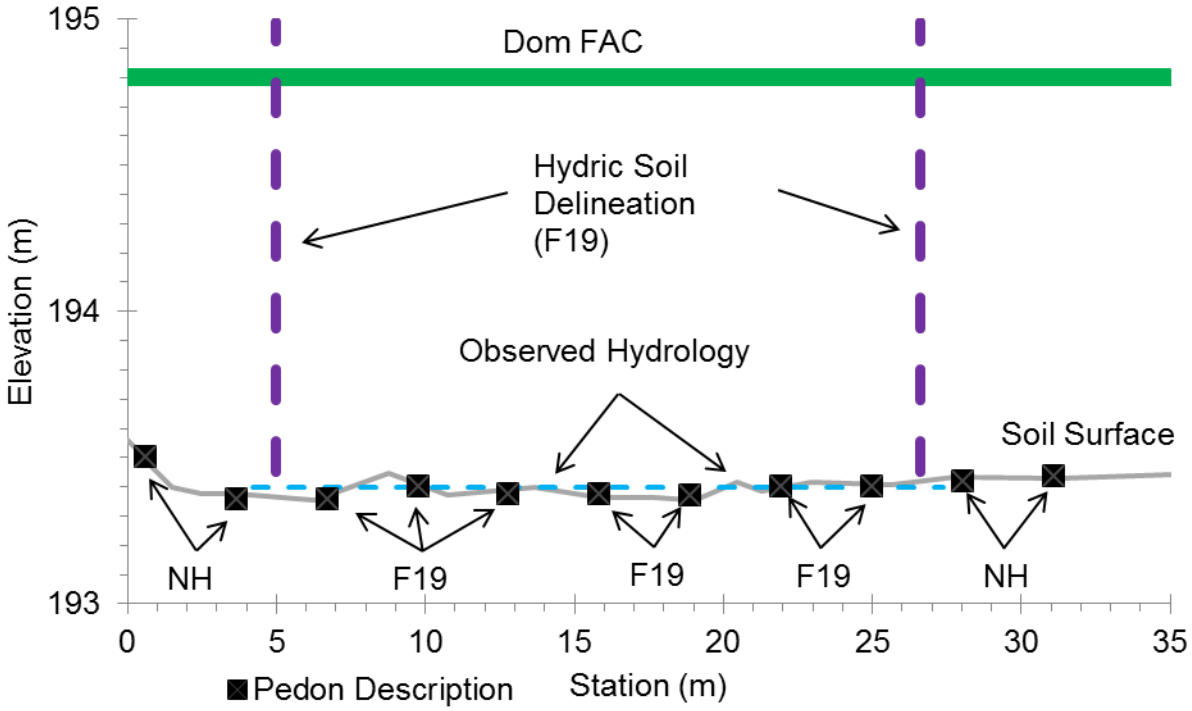

Figure 3. Transect B soil and vegetation. Pedon descriptions were conducted at 3 m intervals along the transect. NH, no hydric soil indicators were met; F19, hydric soil indicator Piedmont Floodplain Soil was met. Dom FAC, facultative vegetation observed to be dominant across the transect. Observed Hydrology, water was present over 2 weeks during first part of growing season. Hydric Soil Delineation, hydric soils delineated using indicator F19.

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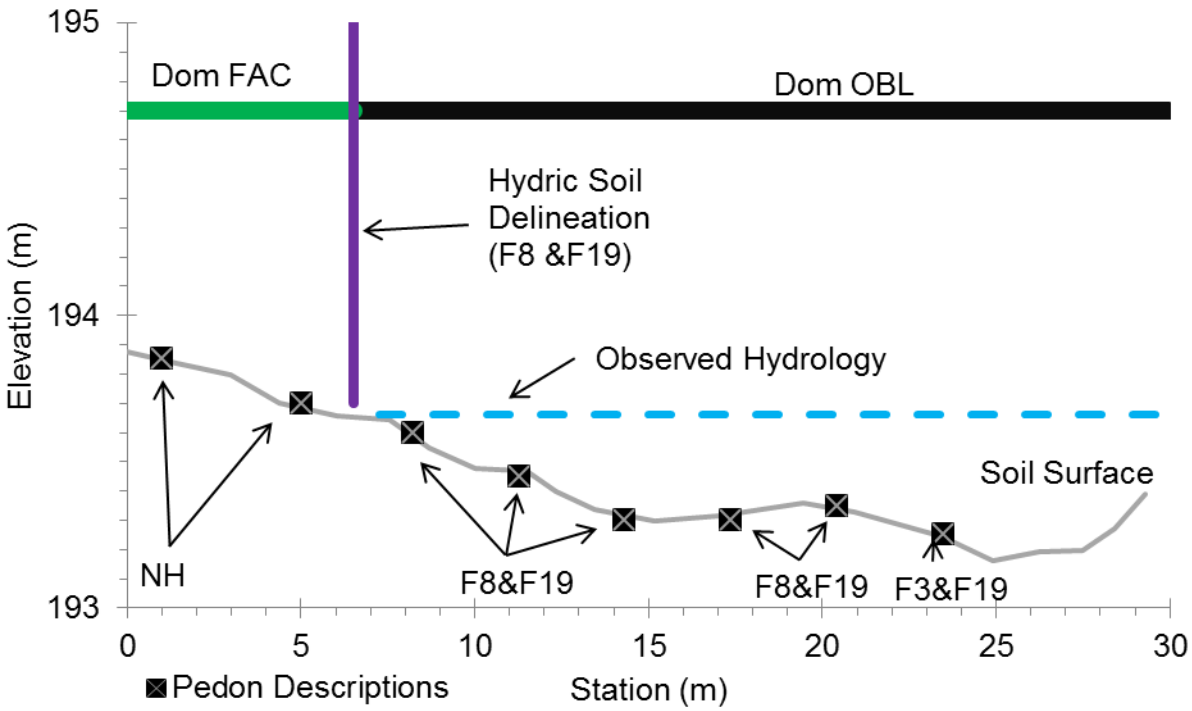

Figure 4. Transect C soil and vegetation. Pedon descriptions were conducted at 3 m intervals along the transect. NH, no hydric soil indicators were met; F3, hydric soil indicator Depleted Matrix was met; F8, hydric soil indicator Redox Depressions was met; F19, hydric soil indicator Piedmont Floodplain Soil was met. Dom FAC, facultative vegetation observed to be dominant. Dom OBL, obligate vegetation observed to be dominant. Observed Hydrology, water was present over 2 weeks during first part of growing season. Hydric Soil Delineation, hydric soils delineated using indicators F8 and F19.

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APPENDIX A: TRANSECT VEGETATION DATA

Table A-1. Vegetation along transect A with station, common name, genus and species, wetland status and sampling stratum.

Transect A

Station (m)	Common Name	Genus + Species	Wetland Status	Stratum
1.8	Sweetgum	Liquidambar styraciflua	FAC	Tree
4.2	Water Oak	Quercus nigra	FAC	Tree
5.4	Chinese Privot Hedge	Ligustrum sinense	FACU	Sapling
5.7	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
8.5	Green Briar	Smilax bona nox	FACU	Woody Vine
10.8	Red Maple	Acer rubrum	FAC	Tree
11.4	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
13.8	Blackberry	Rubus L. ?	FAC	Woody Vine
18.2	Willow Oak	Quercus phellos	FAC	Tree
20.4	Willow Oak	Quercus phellos	FAC	Tree
21.9	Willow Oak	Quercus phellos	FAC	Tree

Table A-2. Vegetation along transect B with station, common name, genus and species, wetland status and sampling stratum.

Transect	B			
Station (m)	**Common Name**	**Genus + Species**	**Wetland Status**	**Stratum**
0.5	Red Maple	Acer rubrum	FAC	Sapling/Shrub
1.2	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
1.8	Red Maple	Acer rubrum	FAC	Sapling/Shrub
3.5	Red Maple	Acer rubrum	FAC	Tree
4.3	Red Maple	Acer rubrum	FAC	Sapling/Shrub
4.6	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
5.2	Red Maple	Acer rubrum	FAC	Sapling/Shrub
6.7	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
8.8	Willow Oak	Quercus phellos	FAC	Tree
10.1	Willow Oak	Quercus phellos	FAC	Tree
11.7	Sweetgum	Liquidambar styraciflua	FAC	Sapling/Shrub
13.4	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
13.7	Red Maple	Acer rubrum	FAC	Tree
14.6	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
15.2	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub
20.7	Red Maple	Acer rubrum	FAC	Sapling/Shrub
21.8	Sweetgum	Liquidambar styraciflua	FAC	Sapling/Shrub
22.9	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/Shrub

Table A-3. Vegetation along transect C with station, common name, genus and species, wetland status and sampling stratum.

Transect	C			
Station (m)	**Common Name**	**Genus + Species**	**Wetland Status**	**Stratum**
0.8	Musclewood	Carpinus caroliniana	FAC	Sapling/shrub
2.7	Serviceberry	Amelanchier arborea	FAC	Sapling/shrub
2.9	Chinese Privet Hedge	Ligustrum sinense	FACU	Sapling/shrub
3.7	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
4.1	Red Maple	Acer rubrum	FAC	Sapling/shrub
5.8	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
5.6	Willow Oak	Quercus phellos	FAC	Sapling/shrub
6.4	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
6.7	Serviceberry	Amelanchier arborea	FAC	Sapling/shrub
9.1	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
12.2	Broadleaf Arrowhead	Sagittaria latifolia	OBL	Herb
17.5	Water Tupelo	Nyssa aquatica	OBL	Tree
20.4	Water Tupelo	Nyssa aquatica	OBL	Tree
23.8	Water Tupelo	Nyssa aquatica	OBL	Tree

APPENDIX B: SOIL PEDON DESCRIPTIONS

Table B-1. Description of soil pedon A1001

Transect A
Pedon A1001
Station 22.78 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-15	cl	7.5YR 4/2	-	-	-	-	-	-	-
Bt1	15-23	cl	7.5 YR 4/3	10	3F	10YR 5/2	15	3D	7.5 YR 3/3	-
Bt2	23-31	c	7.5YR 5/2	15	2-3F	10YR 5/1	20	3D	7.5 YR 3/3	F3,F19
Bt3	31-40	c	10YR 5/2	10	3F	10YR 6/1	15	3P	7.5 YR 3/4	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-2. Description of soil pedon A1002

Transect A
Pedon A1002
Station 19.74 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-13	cl	10YR 4/2	-	-	-	-	-	-	-
Bt1	13-22	c	10YR 4/2	-	-	-	15	3D	7.5 YR 4/4	-
Bt2	22-31	c	10YR 5/2	10	2F	10 YR 6/1	15	3P	10 YR 5/6	F3, F19
							5	3P	7.5 YR 4/4	
Bt3	31-40	c	10YR 7/1	-	3F	10YR 6/1	20	3P	10 YR 5/6	-
							5	3P	7.5 YR 4/4	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-3. Description of soil pedon A1003

Transect A
Pedon A1003
Station 16.68 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-10	cl	7.5YR 4/2	-	-	-	-	-	-	-
Bt1	10-18	c	10YR 5/3	10	2F	10YR 5/2	10	3P	5YR 4/4	-
Bt2	18-23	c	10YR 6/2	15	2F	2.5Y 6/1	20	3P	7.5YR 5/6	F3,F19
Bt3	23-30	c	10YR 6/2	20	2F	2.5Y 6/1	15	3P	7.5YR 5/6	-
Bt4	30-40	c	10 YR 6/2	5	2F	2.5Y 6/1	10	3P	7.5YR 5/6	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-4. Description of soil pedon A1004

Transect A
Pedon A1004
Station 13.64 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-10	cl	7.5YR 4/2	-	-	-	5	2D	7.5YR 4/4	-
Bt1	10-21	c	10YR 5/3	5	2F	10YR 5/2	10	2-3D	5YR 4/4	-
Bt2	21-24	c	10YR 5/3	20	2F	2.5Y 6/1	15	3P	7.5YR 5/6	-
Bt3	24-40	c	10YR 5/2	10	3F	2.5Y 6/1	5 5	3P 3D	10YR 5/6 10YR 3/4	F3

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix.

Table B-5. Description of soil pedon A1005

Transect A
Pedon A1005
Station 10.59 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features						Hydric Soil Indicator (s) met
				Depletions			Concentrations			
				Abundance %	Type	Color	Abundance %	Type	Color	
BA	0-11	c	10YR 4/2	-	-	-	-	-	-	-
Bt1	11-23	c	10YR 4/3	-	-	-	5	2F	10YR 3/4	-
Bt2	23-28	cl	10YR 5/2	10	2F	10YR 6/1	15	2-3P	10YR 4/6	F3
BC	28-40	scl	10YR 6/2	10	3F	10YR 7/1	10	3D	10YR 4/4	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix.

Table B-6. Description of soil pedon A1006

Transect	A									
Pedon	A1006			Redox Features						
Station	7.54 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
BA	0-13	c	10YR 4/2	-	-	-	-	-	-	-
Bt1	13-20	cl	10YR 4/3	-	-	-	5	2F	10YR 3/4	-
Bt2	20-25	scl	10YR 5/2	5	2F	10YR 6/1	10	2-3P	7.5YR 4/6	F3
BC	25-40	scl	10YR 6/1	5	2F	10YR 7/1	10	3P	7.5YR 4/6	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix.

Table B-7. Description of soil pedon A1007

Transect	A									
Pedon	A1007			Redox Features						
Station	4.5 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
BA	0-13	c	10YR 4/3	-	-	-	-	-	-	-
Bt1	13-18	c	10YR 4/2	-	-	-	5	2-3P	10YR 3/6	-
Bt2	18-22	cl	10YR 5/2	5	2F	10YR 6/1	10	3D	10YR 4/4	F3
BC	22-36	scl	10YR 5/1	5	2F	10 YR 6/1	15	3D	10YR 4/4	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-8. Description of soil pedon A1008

Transect	A									
Pedon	A1008			**Redox Features**						
Station	2.05 m			**Depletions**			**Concentrations**			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-13	cl	10YR 3/3	-	-	-	-	-	-	-
Bt1	13-18	cl	10YR 4/3	-	-	-	10	2-3P	7.5 YR 4/6	-
Bt2	18-23	cl	10YR 5/3	10	2F	10YR 5/2	15	2-3P	7.5YR 4/6	-
Bt3	23-36	cl	10YR 5/2	5	2F	10 YR 6/1	20	3D	10YR 4/4	F19

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-9. Description of soil pedon A1009

Transect	A									
Pedon	A1009			Redox Features						
Station	0.25 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-10	cl	10YR 3/3	-	-	-	-	-	-	-
Bt1	10-17	cl	7.5 YR 4/4	-	-	-	10	2F	7.5 YR 3/4	-
Bt2	17-26	scl	10YR 4/4	20	2F	10YR 5/3	15	2-3D	7.5 YR 4/6	-
BC	26-36	scl	10YR 5/3	25	2-3F	10YR 5/2	5	3P	7.5 YR 5/6	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-10. Description of soil pedon B1001

Transect	B									
Pedon	B1001			Redox Features						
Station	0.61 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-5	sicl	10YR 4/3	-	-	-	-	-	-	-
Bt1	5-13	c	10YR 4/4	-	-	-	10	2F	5YR 4/4	-
Bt2	13-20	c	7.5YR 4/6	-	-	-	15	2-3D	5YR 4/4	-
							5	2P	5YR 3/3	
Bt3	20-36	c	7.5YR 5/4	10	2F	10YR 6/3	20	2-3D	5YR 4/6	-
							5	2D	5YR 3/3	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam; sicl, silty clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-11. Description of soil pedon B1002

Transect	B									
Pedon	B1002			Redox Features						
Station	3.66 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-10	cl	10YR 4/3	-	-	-	-	-	-	-
Bt	10-20	c	10YR 4/4	-	-	-	5	2-3P	10YR 3/4	-
							5	2P	10YR 2/1	
BC1	20-28	sl	10YR 5/4	10	2D	10YR 5/2	10	2-3D	5YR 4/6	-
							5	2D	10YR 2/2	
							3	2P	5YR 2.5/1	
BC2	28-36	cl	10YR 5/2	20	2F	10YR 6/1	10	2-3D	7.5YR 4/4	-
							5	2F	10YR 3/3	
							5	2P	10YR 4/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-12. Description of soil pedon B1003

Transect B
Pedon B1003
Station 6.71 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-10	cl	10YR 4/3	-	-	-	-	-	-	-
Bt1	10-18	c	7.5YR 4/3	-	-	-	10	2F	7.5YR 4/4	-
Bt2	18-24	cl	10YR 5/3	5	2D	10YR 6/2	25 3	2-3D 2P	7.5YR 3/4 5YR 2.5/1	F19
Bt3	24-40	cl	10YR 5/2	10	2-3F	10YR 6/1	20 5	2-3D 2P	7.5YR 3/4 5YR 2.5/1	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-13. Description of soil pedon B1004

Transect B
Pedon B1004
Station 9.75 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-8	cl	7.5YR 3/4	-	-	-	-	-	-	-
Bt1	8-18	c	7.5YR 4/3	-	-	-	15	2F	7.5YR 3/4	-
Bt2	18-22	cl	10YR 4/4	-	-	-	10	2F	10YR 3/4	-
							5	2D	10YR 2/1	
Bt3	22-25	cl	10YR 5/3	10	2F	10YR 6/1	15	2-3D	7.5YR 5/6	F19
							10	2-3D	7.5YR 4/6	
Bt4	25-40	cl	10YR 5/2	5	2F	10YR 6/1	20	2-3D	7.5YR 4/4	-
							2	2P	5YR 2.5/1	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-14. Description of soil pedon B1005

Transect B
Pedon B1005
Station 12.80 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-10	cl	7.5YR 4/3	-	-	-	-	-	-	-
Bt1	10-20	c	7.5YR 4/3	-	-	-	15	2F	7.5YR 4/4	-
							5	2F	7.5YR 3/3	
							5	2D	7.5YR 5/6	
BC1	20-24	sl	10YR 5/4	5	2F	10YR 5/3	10	2D	5YR 4/4	-
							10	2-3D	7.5YR 3/4	
BC2	24-40	scl	10YR 5/2	10	2F	10YR 6/1	20	2-3D	7.5YR 3/4	F19
							3	2P	5YR 2.5/1	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-15. Description of soil pedon B1006

Transect B
Pedon B1006
Station 15.85 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-8	c	7.5YR 4/3	-	-	-	-	-	-	-
Bt1	8-13	c	7.5YR 4/3	-	-	-	5	2F	5YR 3/2	-
Bt2	13-23	c	10YR 4/3	5	2F	10YR 5/2	15 5	2-3F 2D	7.5YR 4/3 5YR 3/2	F19
Bt3	23-40	cl	10YR 5/2	10	2F	10YR 6/1	20 2	2-3D 2P	10YR 3/4 5YR 2.5/1	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-16. Description of soil pedon B1007

Transect B **Pedon** B1007 **Station** 18.90m				**Redox Features**						
				Depletions			**Concentrations**			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-8	cl	10YR 4/3	-	-	-	-	-	-	-
Bt1	8-12	c	7.5YR 4/4	-	-	-	5	2F	5YR 3/3	-
Bt2	12-22	c	7.5YR 5/4	5	2D	10YR 6/2	20	2F	7.5YR 3/4	-
							2	2D	5YR 3/3	
BC	22-40	scl	10YR 6/2	5	2F	10YR 7/1	20	2-3D	7.5YR 4/4	F19
							3	2P	5YR 3/3	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-17. Description of soil pedon B1008

Transect B
Pedon B1008
Station 21.95 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-5	cl	10YR 4/3	-	-	-	-	-	-	-
Bt1	5-13	c	7.5YR 4/4	-	-	-	20	2F	7.5YR 3/4	-
Bt2	13-18	c	7.5YR 5/4	10	2D	10YR 6/2	20	2-3D	7.5YR 3/4	-
							5	2F	7.5YR 3/3	
Bt3	18-36	cl	10YR 6/2	5	2F	10YR 7/1	20	2-3D	7.5YR 4/4	F19
							5	2P	7.5YR 3/3	
							2	2P	5YR 5/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-18. Description of soil pedon B1009

Transect B
Pedon B1009
Station 24.99 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-8	c	10YR 4/3	-	-	-	-	-	-	-
Bt1	8-15	c	10YR 4/3	-	-	-	5	2F	7.5YR 3/4	-
Bt2	15-24	c	7.5YR 4/4	10	2D	10YR 5/2	20 3	2-4F 2D	7.5YR 3/4 7.5YR 2.5/1	-
Bt3	24-40	cl	10YR 5/2	15	2F	10YR 6/1	20 5	2-3D 2D	7.5YR 4/4 7.5YR 3/3	F19

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-19. Description of soil pedon B1010

Transect B
Pedon B1010
Station 28.04 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-10	c	10YR 4/3	-	-	-	-	-	-	-
Bt1	10-18	c	10YR 4/3	-	-	-	10	3F	7.5YR 3/4	-
								2D	7.5YR 2.5/1	
Bt2	18-28	c	10YR 4/3	10	2F	10YR 6/2	10	2-3F	7.5YR 3/4	-
							2	2F	7.5YR2.5/1	
Bt3	28-36	cl	10YR 5/3	15	2D	10YR 6/1	20	2-3P	5YR 3/3	-
							5	2D	7.5YR 2.5/1	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-20. Description of soil pedon B1011

Transect B
Pedon B1011
Station 31.09 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-11	c	10yr 4/4	-	-	-	-	-	-	-
Bt1	11-20	c	7.5YR 4/4	-	-	-	5	2F	7.5YR 3/4	-
Bt2	20-28	c	7.5YR 4/4	5	2D	10YR 6/2	10	2-3F	5YR 4/4	-
							3	2D	7.5YR 2.5/1	
Bt3	28-36	cl	10YR 4/3	10	2D	10YR 6/1	10	2-3F	7.5YR 4/4	-
							5	2F	7.5YR 3/3	
							2	2D	7.5YR 2.5/1	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F19, Piedmont Floodplain Soils

Table B-21. Description of soil pedon C1001

Transect	C									
Pedon	C1001			Redox Features						
Station	0.61 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-5	sicl	7.5YR 4/4	-	-	-	-	-	-	-
Bt1	5-18	c	7.5YR 4/4	-	-	-	-	-	-	-
Bt2	18-25	c	7.5YR 4/4	20	2F	10YR 5/4	15	2-3F	7.5YR 5/4	-
Bt3	25-36	c	10YR 5/4	25	2D	10YR 6/2	20 2	2-3F 2P	7.5YR 4/4 7.5YR 2.5/1	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam; sicl, silty clay loam.
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-22. Description of soil pedon C1002

Transect	C									
Pedon	C1002			**Redox Features**						
Station	5.03 m			**Depletions**			**Concentrations**			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-8	cl	10YR 4/4	-	-	-	-	-	-	-
Bt1	8-22	c	7.5YR 4/6	10	2F	10YR 5/3	10	2-3F	5YR 4/6	-
Bt2	22-36	c	7.5YR 5/4	20	2F	10YR 5/3	10	2-3D	7.5YR 4/6	-

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-23. Description of soil pedon C1003

Transect	C									
Pedon	C1003			Redox Features						
Station	8.23 m			Depletions			Concentrations			
Horizon	Depth (cm)	Texture	Matrix Color	Abundance %	Type	Color	Abundance %	Type	Color	Hydric Soil Indicator (s) met
A	0-10	cl	10YR 4/4	-	-	-	-	-	-	-
Bt1	10-18	c	10YR 4/4	5	2F	10YR 5/3	10	2F	5YR 4/4	F8
							8	2D	5YR 5/6	
Bt2	18-24	c	10YR 4/4	20	2F	10YR 5/3	20	2P	5YR 5/6	-
							10	2F	5YR 4/4	
Bt3	24-40	c	10YR 5/3	5	2F	10YR 6/2	15	2-3P	5YR 5/6	F19
							5	2D	5YR 4/4	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-24. Description of soil pedon C1004

Transect C
Pedon C1004
Station 11.28 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-4	cl	10YR 4/4	-	-	-	-	-	-	-
Bt1	4-13	c	10YR 4/3	5	2F	10YR 5/3	10	2P	5YR 5/6	F8
							5	2P	7.5YR 4/6	
Bt2	13-18	c	10YR 4/3	10	2F	10YR 5/3	15	2-3P	5YR 5/6	-
							15	2-3P	7.5YR 4/6	
Bt3	18-23	c	10YR 5/3	5	2F	10YR 6/2	10	2P	5YR 5/6	F19
							10	2-3P	7.5YR 4/6	
Bt4	23-31	c	10YR 5/3	7	2F	10YR 6/2	20	2-3P	5YR 5/6	-
							5	2P	7.5YR 4/6	
Bt5	31-36	c	10YR 5/3	10	2D	10YR 6/1	20	2-3P	5YR 5/6	-
							5	2P	7.5YR 4/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-25. Description of soil pedon C1005

Transect C
Pedon C1005
Station 14.33 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-8	cl	10YR 4/3	-	-	-	-	-	-	-
Bt1	8-20	c	10YR 6/2.5	5	2F	10YR 6/1	20	2-3P	5YR 5/6	F8
							10	2D	7.5YR 4/4	
BC1	20-30	c	10YR 6/2.5	10	2F	10YR 5/2	15	2D	5YR 5/6	F19
							10	2-3D	7.5YR 3/4	
BC2	30-36	c	10YR 5/2	10	2F	10YR 6/1	10	2-3D	7.5YR 3/4	-
							10	2P	5YR 5/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-26. Description of soil pedon C1006

Transect C
Pedon C1006
Station 17.37 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features						Hydric Soil Indicator (s) met
				Depletions			Concentrations			
				Abundance %	Type	Color	Abundance %	Type	Color	
A	0-5	c	2.5Y 5/3	-	-	-	2	2P	5YR 4/6	-
Bt1	5-13	c	10YR 5/3	-	-	-	5	2P	5YR 4/6	F8
							1	2D	10YR 2/2	
Bt2	13-18	c	10YR 5/3	-	-	-	15	2-3P	7.5YR 4/6	-
							10	2D	10YR 3/6	
Bt3	18-23	c	10YR 5/3	15	2F	10YR 6/2	15	2-3P	7.5YR 4/6	F19
							5	2D	10YR 3/6	
Bt4	23-36	c	10YR 6/2	20	2F	10YR 6/1	15	2-3P	7.5YR 4/6	-
							7	2D	10YR 3/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-27. Description of soil pedon C1007

Transect C
Pedon C1007
Station 20.42 m

				Redox Features						
				Depletions			Concentrations			
Horizon	**Depth (cm)**	**Texture**	**Matrix Color**	**Abundance %**	**Type**	**Color**	**Abundance %**	**Type**	**Color**	**Hydric Soil Indicator (s) met**
A	0-5	c	10YR 5/3	-	-	-	7	2P	5YR 4/6	F8
Bt1	5-10	c	10YR 5/3	-	-	-	15	2P	5YR 4/6	-
Bt2	10-18	c	10YR 5/3	7	2F	10YR 6/2	20	2D	7.5YR 5/6	F19
							10	2-3P	7.5YR 4/6	
Bt3	18-23	c	10YR 5/3	20	2F	10YR 6/2	12	2-3P	7.5YR 4/4	-
							10	2D	7.5YR 5/6	
Bt4	23-36	c	10YR 6/2	10	2F	10YR 6/1	10	2-3P	7.5YR 4/4	-
							10	2D	7.5YR 5/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8, Redox Depression; F19, Piedmont Floodplain Soils

Table B-28. Description of soil pedon C1008

Transect C
Pedon C1008
Station 23.47 m

Horizon	Depth (cm)	Texture	Matrix Color	Redox Features: Depletions Abundance %	Depletions Type	Depletions Color	Redox Features: Concentrations Abundance %	Concentrations Type	Concentrations Color	Hydric Soil Indicator (s) met
A	0-5	cl	10YR 4/3	-	-	-	-	-	-	-
Bt1	5-10	c	7.5YR 4/3	-	-	-	20	2F	7.5YR 3/4	-
Bt2	10-14	c	7.5YR 5/3	10	2D	10YR 6/2	20	2-3D	7.5YR 3/4	-
							5	2F	7.5YR 3/3	
Bt3	14-36	cl	10YR 6/2	5	2F	10YR 7/1	20	2-3D	7.5YR 4/4	F3,F19
							5	2P	7.5YR 3/3	
							2	2P	5YR 5/6	

Texture: sil, silt loam; l, loam; sl, sandy loam; c, clay; cl, clay loam; scl, sandy clay loam
Color: Munsell® soil color notation
Depletion/Concentration Type: 1, fine; 2, medium; 3, coarse; F, faint; D, distinct; P, prominent.
Hydric Soil Indicator(s): F3, Depleted Matrix; F8 Redox Depressions; F19, Piedmont Floodplain Soils

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BIOGRAPHICAL SKETCH

Shannon Hudgins was born in Decatur, Georgia where he lived with his mother and grandparents until the age of 10. Shannon always loved playing outside making forts and digging tunnels for his Star Wars action figures. One of his favorite places to go to as a child was Panola Mountain State Park in Lithonia Georgia. Shannon was fascinated by the massive granite rock and vegetation growing in shallow crevasses. He and his mother moved to Covington, Georgia during his middle school years. He attended Newton County High School where he started dating his future bride Darlene Parish. It was no surprise to his family when he decided to pursue a degree in geology. Shannon discovered his passion for mapping during a 6 week geology field course in Montana during his junior year. Both Darlene and Shannon graduated from Georgia State University with bachelor's degrees in Risk Management and Geology respectively. They were married shortly after graduation.

Shannon's first full time job in the geosciences was as an environmentalist for a local health department. It was through that position he was introduced to soil science. A job as a consulting soil scientist seemed to be the ideal career for Shannon. He found a soil scientist willing to become his mentor for the 4 years needed to become a certified soil classifier. He returned to school at the University of Georgia to earn the required credits in soil science. It was then Darlene and Shannon had their first child. Shannon became a certified soil classifier and enjoyed a successful business mapping soils. Shannon and Darlene had two more children and continued to enjoy the blessings of life.

An economic downturn slowed the soil consulting business and Shannon enrolled at the University of Florida to pursue a Master's Degree through the Soil and

Water Science Department. He graduated in May of 2015 eager to begin the next chapter in his life.