

APPENDIX C
ADVERSE IMPACTS ASSESSMENT



ADVERSE IMPACT ASSESSMENT

Project Soter

Ridgeville, Berkeley County, SC

Prepared for:

Berkeley County

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April 10, 2015

Project No. 6250-15-0079

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1.0 EXECUTIVE SUMMARY

This adverse impact assessment details the existing conditions of the wetlands on the Camp Hall Tract, in Berkeley County, South Carolina. The Camp Hall site has been intensively managed for production of loblolly pine with almost all of the entire site in bedded pine plantation, hauls roads, and drainage ditches. The wetlands on the site include mostly wet loblolly pine plantation with some isolated forested ponds and other wetland habitats. A total of 192.86 acres of jurisdictional wetlands, 23.14 acres of non-jurisdictional isolated wetlands, and 1.85 acres of jurisdictional relatively permanent waters will be impacted by the project which includes 166.91 acres of wet pine planation. A preliminary site plan has been developed and dominant impacts to each wetland resource were categorized as either shading clearing, dredging, or filling. The North Carolina Wetland Assessment Method was utilized to assess the current condition of each wetland to be impacted and the US Army Corps of Engineers (USACE) low gradient stream assessment forms were used to assess the current condition of the jurisdictional relatively permanent waters (RPW) to be impacted.

2.0 PROJECT OVERVIEW

The State of South Carolina and Berkeley County has promoted a site in Berkeley County to attract a major manufacturing facility into South Carolina. The proposed industrial facility is to be located on an approximately 6,781-acre site (Camp Hall Site) that lies adjacent to Interstate 26 and S.C. Route 27/Old Gillard Road northeast of Ridgeville, South Carolina (Figure 1).

The State of South Carolina believes that development of the Camp Hall Site will lead to investments into the facility in excess of \$1 billion. The proposed manufacturing facility is estimated to create 2,000 jobs with the potential up 4,000 jobs within ten years after the start of production. The potential development of the Camp Hall Site would be a major economic impetus to the community, the state and the nation.

The Camp Hall Site is one of a number of sites in the United States that is competing for location of the manufacturing facility. Some of the criteria to select the site include:

- the availability of sufficient qualified labor for a modern production facility
- the quality of life - housing, education, culture, and recreation to attract, retain, and motivate their employees
- a positive relationship between business and government infrastructure to support their business strategy
- site conditions environmentally suitable for development.

The Camp Hall site in South Carolina fulfills these requirements. The applicant desires to acquire the necessary permits and make the proposed site available for immediate construction.

Development will include clearing and preparation of portions of the approximately 2,989-acre site for a proposed manufacturing facility (Figure 5). The proposed site development plan will also include ancillary parking, a visitor center, new frontage and access roads, a new highway interchange, utility corridors, and other associated buildings and facilities.

2.1. Land Use

The study area, the Camp Hall tract (Camp Hall), is an approximately 6,781-acre tract actively utilized for silviculture. Camp Hall is intensely managed for timber, resulting in heavy bedding, interconnecting ditch systems, and established pine stands in various stages of rotation. There is no evidence of fire management within the tract. The primary species in rotation on the tract is loblolly pine (*Pinus taeda*), with smaller stands of longleaf pine (*Pinus palustris*) and sweetgum (*Liquidambar styraciflua*) also present. Minor components of the Camp Hall tract that are not currently in rotation include areas of mixed hardwood and wetland hardwood forests, including isolated ponds and areas associated with the Timothy Creek drainage.

The primary haul roads accessing the tract are maintained, including Westvaco Road (Pringle Road), Lower Westvaco Road (Camp Hall Road), and Centerline Road. There is gate access to the tract from the east on Ridgeville Road/Highway 27, from the north on Fish Road, and from the south on Cypress Campground Road. Roads accessing interior areas are established, but a portion of these roads do not appear to be maintained.

In addition to intense timber production, Camp Hall is leased for hunting. An active hunting camp is located within the eastern-central portion of the tract, and negligible areas scattered throughout the property appear to be utilized as food plots. Camp Hall is also crossed by a Santee Cooper transmission line corridor. The transmission line right-of-way is actively maintained and runs east-southeast to west-northwest across the southern portion of the tract.

2.2. Geology and Topography

Camp Hall is located in the Middle Atlantic Coastal Plain Section Level III Ecoregion of the Outer Coastal Plain Physiographic Province. This landform consists of a flat, weakly dissected alluvial plain formed by the deposition of continental sediments onto a submerged, shallow continental shelf, which was later exposed by sea level subsidence. Geology in this Section is comprised of rocks formed through this process during the Cenozoic Era, with strata that consist of Quaternary marine deposits, including shales and sands, and smaller areas of Tertiary marine deposits, including silts and clays. The soils resulting from this geology have a mixed or siliceous mineralogy, and are mainly Ultisols, Spodosols, and Entisols. Camp Hall soils are discussed in further in Section 2.3.

Elevation ranges from 0 to 80 feet in the Middle Atlantic Coastal Plain Section, with typical local relief ranges from 10 to 20 feet on flat plains and from 20 to 40 feet on irregular plains. The topography of Camp Hall is generally flat terrain (Figure 2). Elevations are at their greatest in the

northwest corner of the property reaching approximately 75 feet above mean sea level (amsl) and at their lowest at approximately 55 amsl, in the Timothy Creek drainage. The flat topography of Camp Hall is drained by an elaborate system of RPWs that convey water to Timothy Creek and two unnamed tributaries to Timothy creek southwest of the tract.

2.3. Soils

Soils within the Camp Hall tract were mapped by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Berkeley County Soil Survey. Soils on the site are summarized in Table 1. Approximately 70.8% of the site contains Farmland of Statewide Importance, 11.6% of the site contains areas designated as Prime Farmland, and the remaining 17.6% of the site is not considered prime farmland. According to information obtained from the USDA-NRCS, the majority of the soils in the vicinity are classified as sandy loam (Figure 3). Table 1 summarizes the map units, along with soils descriptions.

Table 1. Soil types – Camp Hall Tract

| Map Unit Symbol | Map Unit Name | Area (acres) | Description | Hydric Rating (%) |
|-----------------|---------------------------|--------------|--|-------------------|
| Be | Bethera loam | 19 | Poorly drained hydric soil found on 0 to 2% slopes. | 97 |
| By | Byars loam | 23 | Very poorly drained hydric soil found on 0 to 2% slopes. | 97 |
| CaB | Cainhoy fine sand | 2 | Somewhat excessively drained soil found on 0 to 6% slopes | 0 |
| Ct | Chipleigh-Echaw complex | 3 | Somewhat poorly drained soil found on 0 to 2% slopes | 2 |
| Cu | Coxville fine sandy loam | 1,341 | Poorly drained hydric soil found on 0 to 2% slopes. | 97 |
| CvA | Craven loam | 109 | Moderately well drained soil with hydric inclusions found on 0 to 2% slopes. | 2 |
| DuA | Duplin fine sandy loam | 54 | Moderately well drained soil with hydric inclusions found on 0 to 2% slopes. | 2 |
| GoA | Goldsboro loamy sand | 613 | Moderately well drained soil with hydric inclusions found on 0 to 2% slopes. | 2 |
| Le | Lenoir fine sandy loam | 405 | Somewhat poorly drained soil with hydric inclusions found on 0 to 2% slopes. | 2 |
| Lo | Leon fine sand | 10 | Poorly drained hydric soil found on 0 to 2% slopes. | 100 |
| Ly | Lynchburg fine sandy loam | 1,119 | Somewhat poorly drained soil with hydric inclusions found on 0 to 2% slopes. | 4 |
| Mg | Meggett loam | 2,178 | Poorly drained hydric soil found on 0 to 2% slopes. | 100 |

| Map Unit Symbol | Map Unit Name | Area (acres) | Description | Hydric Rating (%) |
|-----------------|-----------------------|--------------|--|-------------------|
| NoA | Norfolk loamy sand | 8 | Well drained soil found on 0 to 2% slopes. | 0 |
| Ra | Rains fine sandy loam | 651 | Poorly drained hydric soil found on 0 to 2% slopes. | 97 |
| Se | Seagate loamy sand | 53 | Somewhat poorly drained soil with hydric inclusions found on 0 to 2% slopes. | 4 |
| Wa | Wahee loam | 181 | Somewhat poorly drained soil with hydric inclusions found on 0 to 2% slopes. | 4 |

Source: NRCS 2015

A majority of the tract contains soils that are listed as hydric, including Bethera loam, Byars loam, Coxville fine sandy loam, Leon fine sand, Meggett loam, and Rains fine sandy loam, or that are listed as containing hydric inclusions, including Craven loam, Duplin fine sandy loam, Goldsboro loamy sand, Lenoir fine sandy loam, Lynchburg fine sandy loam, Seagate loamy sand, and Wahee loam.

2.4. Terrestrial Communities

Camp Hall is located in the Carolina Flatwoods level IV ecoregion within the Middle Atlantic Coastal Plain level III ecoregion. The Carolina Flatwoods, as mentioned in Section 2.2, were covered by shallow coastal waters during the Pleistocene, resulting in terraces and shoreline landforms that are typically covered by fine-loamy or coarse-loam soils, with some areas covered by clayey, sandy, or organic soils, as described in Section 2.3. This variation in soils contributes to the regional plant diversity where pine flatwoods, pine savannas, freshwater marshes, pond pine woodlands, pocosins, and some sandhill communities were once common. Loblolly pine plantations are now widespread with an active forestry industry in the region, where artificial drainage for forestry and agriculture is now common. Communities within Camp Hall, which been heavily influenced by historical and ongoing silviculture activities, now include loblolly pine plantation, longleaf pine plantations, sweetgum plantations, isolated ponds, mixed pine-hardwood forest, bottomland hardwood forest, non-alluvial swamp forest, and maintained areas. Terrestrial communities on the tract are limited to loblolly and longleaf plantations, and maintained areas, described below. The remaining communities consist of wetland areas and are described in Section 3.2.

Loblolly Pine Plantation

Camp Hall is dominated by even-aged planted pine stands ranging from one to 40 year old loblolly pine. Saplings and shrubs in these areas vary in percent cover based on age of the pine and when the stand was thinned. These layers are very limited in unthinned stands. Saplings and shrubs include loblolly pine, sweetgum, American holly (*Ilex opaca*), southern magnolia (*Magnolia grandiflora*), red bay (*Persea borbonia*), sweetbay (*Magnolia virginiana*), wax myrtle (*Morella cerifera*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), eastern baccharis (*Baccharis halimifolia*), fetterbush (*Lyonia lucida*), high bush blueberry (*Vaccinium corymbosum*), and

Chinese privet (*Ligustrum sinense*). The herbaceous layer is nearly absent in all of the stands, with the exception of newly cut and planted stands. The herbaceous layer includes planted loblolly pine, broom sedge (*Andropogon virginicus*), bushy bluestem (*A. glomeratus*), dog fennel (*Eupatorium capillifolium*), black berry (*Rubus spp.*), panic grass (*Panicum spp.*), St. John's wort (*Hypericum hypericoides*), goldenrod (*Solidago spp.*), bracken fern (*Pteridium aquilinum*), yellow jasmine (*Gelsemium sempervirens*), muscadine vine (*Vitis rotundifolia*), and greenbrier (*Smilax spp.*).

Longleaf Pine Plantation

One stand of planted longleaf pine is located in the northeast section of the tract along Fish Road. The overstory is comprised of approximately 20% longleaf pine and 10% loblolly pine. Saplings and shrubs include sweetgum, post oak (*Quercus stellata*), water oak (*Q. nigra*), turkey oak (*Q. laevis*), inkberry (*Ilex glabra*), wax myrtle, high bush blueberry, horse sugar (*Symplocos tinctoria*), and sweet pepperbush (*Clethra alnifolia*). The herbaceous layer includes bracken fern and heavy pine straw.

Maintained Areas (Right-of-Ways)

Maintained areas within the tract are limited to roadsides and the Santee Cooper transmission line corridor. Though portions of the maintained areas are within wetlands, the vegetative cover remains similar across the tract. The maintained areas appear to be mowed, and there is evidence of spraying woody species along the transmission line corridor. These activities result in a community dominated by an herbaceous layer lacking an overstory or midstory. The herbaceous layer includes broom sedge, bushy bluestem, soft rush (*Juncus effusus*), blackberry, sedges (*Carex spp.*), panic grass, yellow jasmine, wax myrtle, goldenrod, and thistle (*Cirsium spp.*).

3.0 SURFACE WATERS

Surface water includes streams, rivers, lakes, and reservoirs. The majority of Camp Hall is located within the Four Hole Swamp Watershed (Hydrologic Unit Code [HUC] 03050205) of the Edisto River Sub-basin, while a small area in the northeast corner of the tract is located within the Cooper River Watershed (HUC 03050201). No major water bodies occur within the Camp Hall tract. Timothy Creek, and two unnamed tributaries to the Timothy Creek, are located directly adjacent to the western property boundary of the Camp Hall tract, however, these stream features disperse into an on-site ditch system at the property line and no discernable channel remains on the property (Figure 2). The majority of the wetlands on the impact site drain through an elaborate ditch system into Timothy Creek or its tributaries. Timothy Creek is not a 303(d) listed stream. The surface water classifications listed for these waters are based on the most recent South Carolina Department of Health and Environmental Control (SCDHEC) 2012 303(d) List.

3.1. Waters of the US Delineation Methodology

Jurisdictional waters of the US, including wetlands, are defined by 33 CFR Part 328.3(b) and are protected by Section 404 of the CWA (33 United States Code [USC] 1344), which is administered

and enforced in South Carolina by the United States Army Corps of Engineers (USACE), Charleston District. The landward limits of waters of the US regulatory jurisdiction at Camp Hall were delineated by Newkirk Environmental, Inc. in 2009. The site received jurisdictional determination from USACE in 2012 (letter dated August 16, 2012 from Mr. Charles Crosby, SAC 2008-00860-2JY).

3.2. Description of Jurisdictional Waters

The US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for Camp Hall classifies three types of wetlands within the tract (Figure 4). Palustrine forested wetlands are the dominant wetland type classified, covering approximately 615.9 acres, while approximately 54.6 acres of palustrine scrub-shrub wetlands, and 1.4 acres of palustrine emergent wetlands are also classified for the site.

The field delineation of the tract, and the resulting USACE-approved jurisdictional determination indicate that the wetlands within the Camp Hall tract are more extensive than those classified by the USFS-NWI. Figure 5 depicts the wetlands from the USACE-approved jurisdictional determination along with site impacts, which are discussed in Section 5. Amec Foster Wheeler conducted a site reconnaissance of streams and wetlands in March of 2015. A summary of the wetland communities identified in the field is provided below, and photographic log is presented in Attachment A.

Wet Loblolly Pine Plantation

As mentioned in the terrestrial communities discussion, Camp Hall is dominated by even-aged planted pine stands ranging from one to 40 year old loblolly pine, a portion of which are wetland areas. Saplings and shrubs in these areas vary in percent cover based on age of the pine and when the stand was thinned, and slightly differ from upland pine stands, though there is significant species overlap. Saplings and shrubs in the wet pine plantations include loblolly pine, sweetgum, diamond-leaf oak (*Quercus laurifolia*), American holly, red bay, sweetbay, wax myrtle, red maple, fetterbush, and high bush blueberry. The herbaceous layer is nearly absent in all of the stands, with the exception of newly cut and planted stands. The herbaceous layer includes planted loblolly pine, broom sedge, bushy bluestem, black berry, panic grass, St. John's wort, goldenrod, sedges, soft rush, muscadine vine, and greenbrier.

Wet Sweetgum Plantation

A sweetgum plantation is located in the central portion of the tract near the intersection of Turkey Road and Centerline road. The area is bedded, and according to forestry maps, was planted in 1997. In addition to areas of ponding, the dominant overstory of sweetgum appears to be unthinned, resulting in very a limited understory. Saplings and shrubs include sweetgum, red bay, red maple, wax myrtle, and Chinese privet. The herbaceous layer includes sedges, soft rush, muscadine vine, and cinnamon fern (*Osmunda cinnamomea*).

Isolated Ponds

Isolated ponds are seasonally to permanently flooded wetland depressions. The Camp Hall ponds are dominated by a nearly closed canopy of hardwoods including sweetgum, red maple, water oak, diamond-leaf oak, willow oak (*Quercus phellos*), and pond pine (*Pinus serotina*). Swamp blackgum (*Nyssa biflora*) and pond cypress (*Taxodium ascendens*) were rarely observed, and limited to a couple of ponds. The edges of these ponds were densely vegetated with shrubs including fetterbush, American holly, sweetbay, sweet pepperbush, inkberry, red bay, wax myrtle, dwarf palmetto (*Sabal minor*), and giant cane (*Arundinaria gigantea*). The herbaceous layer includes sedges, panic grass, greenbrier, club moss, and sphagnum moss. Many ponds which appeared isolated from aerial imagery were found to be depressional landforms in larger wetland systems or connected to Timothy Creek or its tributaries and other wetlands through the tract's ditch system.

Mixed Pine-Hardwood Forest

There are several wetland areas classified as mixed pine-hardwood forests associated with Timothy Creek or its tributaries. These areas are dominated by sweetgum, red maple, water oak, diamond-leaf oak, and loblolly pine; pond cypress and pond pine were also rarely observed. The dominant overstory in the mixed pine-hardwood forest results in a very limited understory. Saplings and shrubs include fetterbush, sweetbay, blackberry, sweet pepperbush, wax myrtle, high bush blueberry, dwarf palmetto, and American holly. The herbaceous layer includes cinnamon fern, sedges, sphagnum moss, greenbrier, muscadine vine, yellow jasmine, and grapefern (*Botrychium spp.*).

Bottomland Hardwood Forest

A bottomland hardwood forest is located along the southern boundary of the tract adjacent to Interstate 26, and conveys flow to an unnamed tributary to Timothy Creek. Forestry maps indicate portions of the area were planted in loblolly pine in 1976, however, the overstory is now dominated by hardwood species. The overstory consist largely of diamond-leaf oak, water oak, and red maple, though a limited number of loblolly pines and pond pines are also present. Saplings and shrubs include dwarf palmetto, giant cane, American holly, redbay, sweetbay, and saplings from the hardwood overstory species. The herbaceous layer is very limited due to the overstory and ponding, and includes sedges, soft rush, greenbrier, and muscadine vine.

Non-Alluvial Swamp Forest

A non-alluvial swamp forest is located along the southern boundary of the tract, east of the bottomland hardwood forest adjacent to Interstate 26, but does not convey flow. Forestry maps indicate portions of the area were planted in loblolly pine in 1973, however, the overstory is now dominated by hardwood species. The species composition is very similar to the bottomland hardwood forest, with the exception of the absence of dwarf palmetto in the understory. The overstory of the swamp forest consists largely of diamond-leaf oak, water oak, and red maple, though a limited number of loblolly pines and pond pines are also present. Saplings and shrubs include giant cane, American holly, redbay, sweetbay, and saplings from the hardwood overstory species. The

herbaceous layer is very limited due to the overstory and ponding, and includes sedges, soft rush, greenbrier, and muscadine vine.

Jurisdictional Relatively Permanent Waters

A system of ditches have been installed throughout the site to facilitate the active timber management of the property. Some of these ditches have been classified as RPWs. These RPW's are located adjacent to some of the timber roads on the property and convey water from the wetlands to downstream receiving waters, including Timothy Creek and its tributaries to the west and Rudd Branch and its tributaries to the east. The flow regime within these RPWs exhibits no evidence of riffles, runs, or shallow pools. The substrate consists of sand, silt, and clay. The banks are steep from historic channelization, are partially vegetated, and appear to be unstable throughout. Sinuosity is absent as these are constructed ditches. Sedimentation within the RPWs is high due to runoff from the adjacent forestry roads.

3.3. General Impacts

Jurisdictional waters of the US, including wetlands, will be impacted as a result of the construction of the proposed project. Compensatory mitigation will be required to offset the permanent impacts. The permanent impacts for this project are assumed to be fill. "Fill" refers to depositing material used for the primary purpose of replacing an aquatic area with dry land. Impacts are discussed in further detail in Section 5.

4.0 FUNCTIONAL ASSESSMENT – WETLANDS

4.1. Wetlands

Wetland functions are physical, chemical, and biological processes or attributes of wetlands that are vital to the integrity of a wetland system, independent of how those benefits are perceived by society. Wetland functions include groundwater recharge, groundwater discharge, flood flow alteration, sediment and shoreline stabilization, sediment and toxicant retention, nutrient removal and transformation, production export, aquatic diversity, and wildlife diversity and abundance. Wetland values are attributes that are not necessarily important to the integrity of a wetland system but which are perceived as valuable to society, and include recreation, uniqueness and heritage, educational and scientific value, and visual quality and aesthetics.

Amec Foster Wheeler used the North Carolina Wetland Assessment Method (NC WAM) to supplement best professional judgment in assessing the functions and values of the wetland areas which occurred within the project site. The *NC WAM User Manual, Version 4.1*, was used in the assessment of the wetland areas. The rationale for using NC WAM is presented below.

The NC WAM is a rapid, observational, scientifically based, field method to determine the level of function of a wetland relative to reference condition. This assessment method was created for use in project planning, alternatives analysis, compliance and enforcement, mitigation planning,

and tracking functional replacement. General wetland types include floodplain and headwater forests.

With regard to the assessment methodology, three major functions are recognized with 11 sub-functions, as follows:

- Hydrology (surface storage and retention, and subsurface storage and retention).
- Water Quality (pathogen change, particulate change, soluble change, physical change, and pollution change).
- Habitat (habitat physical structure, landscape patch structure, vegetative composition, and habitat uniqueness).

Sub-functions and functions are evaluated through 22 field metrics. These metrics have been developed and field-tested to be appropriate to the aforementioned wetland types. Data from completed field assessment forms are entered into a computer program to generate high, medium, and low ratings for each sub-function, function, and the assessment area. Table 2 contains the results of the overall wetland assessment. NC WAM wetland rating sheets are presented in Attachment B.

Table 2. NC WAM Summary

| Assessment Area ¹ | Overall Wetland Rating ² |
|------------------------------|-------------------------------------|
| Wet Loblolly Pine Plantation | Low |
| Wet Sweetgum Plantation | Low |
| Isolated Pond | Medium |
| Mixed Pine-Hardwood Forest | Medium |
| Bottomland Hardwood Forest | Low |
| Non-Alluvial Swamp Forest | Medium |

¹ Wetland assessment areas are based on wetland types due to the homogeneity within wetland types across the Camp Hall Tract.

² Overall Wetland Rating based on calculation of metric scores for functions of hydrology, water quality, and habitat.

4.2. Relatively Permanent Waters

The functional state of the jurisdictional RPWs was assessed using the *USACE Guidelines for Preparing a Compensatory Mitigation Plan*, Low Gradient Stream Assessment Forms (LGSAF). The assessment uses ten habitat parameters to determine the existing conditions prior to project impacts. The condition categories for stream function are: fully functional, partially impaired,

impaired and very impaired. Due to the homogenous nature of the RPWs, one data form was completed which encompasses all RPWs on the impact site. Table 3 contains the results of the stream assessment. Low gradient stream assessment data sheets for these reaches are presented in Attachment C.

Table 3. USACE Stream Assessment Summary


| Reach | LGSAF Score | Condition Category | Comments |
|---------------------|-------------|--------------------|--|
| Jurisdictional RPWs | 7.5 | Impaired | RPWs are located in silvicultural ditches. The RPWs are deeply entrenched and the stream banks are very steep, partially vegetated, and appear unstable. Heavy sedimentation is evident. |

ATTACHMENT A
PHOTOGRAPHIC LOG

Project Soter
Ridgeville, Berkeley County, SC

Photographic Log
 March 2015





| | |
|--|--|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.11.15 |
| | Photo No.: 1 |
| | Photographer: KPH |
| | Description: Longleaf pine (<i>Pinus palustris</i>) plantation planted in 1976, Plot LL-71, along Fish Road in the northeast portion of the tract. |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 2 |
| | Photographer: KPH |
| | Description: Isolated pond located in loblolly pine (<i>Pinus taeda</i>) plantation, Plot LOB-72, in the northeast portion of the tract. The pond is dominated by diamond-leaf oak (<i>Quercus laurifolia</i>). |

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Photographic Log
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|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.11.15 |
| | Photo No.: 3 |
| | Photographer: KPH |
| | Description: Loblolly pine plantation planted in 1976, Plot LOB-64, located in the southwest portion of the tract. This stand has been thinned, and now includes a dense understory of saplings and shrubs. |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.11.15 |
| | Photo No.: 4 |
| | Photographer: KPH |
| | Description: Isolated pond located in loblolly pine plantation, Plot LOB-64, in the southwest portion of the tract. The pond is dominated by diamond-leaf oak. |

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|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 5 |
| | Photographer: KPH |
| | Description: Bottomland hardwood forest in the southwest portion of the tract. The forest is dominated by diamond-leaf oak and red maple (<i>Acer rubrum</i>). |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 6 |
| | Photographer: KPH |
| | Description: Loblolly pine plantation planted in 2014, Plot LOB-73, located in the southeast portion of the tract. Newly planted areas appear to have been clear cut and are dominated by herbaceous plants. |

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| | |
|--|---|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 7 |
| | Photographer: KPH |
|  | Description: Isolated pond located in loblolly pine plantation, Plot LOB-73, in the southeast portion of the tract. The pond margins have been altered by silviculture activities. |
| | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 8 |
| | Photographer: KPH |
| | Description: Isolated pond located in loblolly pine plantation, Plot LOB-82, in the central-eastern portion of the tract. The pond is dominated by diamond-leaf oak. |

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Photographic Log
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|--|---|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.12.15 |
| | Photo No.: 9 |
| | Photographer: KPH |
| | Description: Sweetgum (<i>Liquidambar styraciflua</i>) plantation planted in 1997, Plot SWG, located in the south-central portion of the tract. |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.12.15 |
| | Photo No.: 10 |
| | Photographer: KPH |
| | Description: Mixed pine-hardwood forest, Plot WFH-22, located in the south-central portion of the tract. The forest is dominated by red maple and loblolly pine. |

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|--|--|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.09.15 |
| | Photo No.: 11 |
| | Photographer: BK |
| | Description: An example of a maintained haul road within the tract, Westvaco Road (Pringle Road). |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.09.15 |
| | Photo No.: 12 |
| | Photographer: BK |
| | Description: Santee Cooper transmission line corridor that crossed the southern portion of the tract. This area is maintained through mowing and/or spraying. |

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Photographic Log
 March 2015



| | |
|--|---|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 13 |
| | Photographer: BK |
| | Description: Timothy Creek flowing south, and off site, under Wild Fire Road. The stream is channelized and has been heavily altered from silviculture activities. |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 14 |
| | Photographer: BK |
| | Description: Unnamed Tributary to Timothy Creek No. 1 flowing west, and off site, under West Boundary Road. The stream is channelized and has been heavily altered from silviculture activities. |

Project Soter
Ridgeville, Berkeley County, SC

Photographic Log
 March 2015



| | |
|--|--|
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.10.15 |
| | Photo No.: 15 |
| | Photographer: BK |
| | Description: Unnamed Tributary to Timothy Creek No. 2 flowing south, and off site, through bottomland hardwood forest. The stream is channelized and has been heavily altered from silviculture activities. |
|  | Client: XXXXXXXXXXXX |
| | Location: Camp Hall Tract |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.09.15 |
| | Photo No.: 16 |
| | Photographer: BK |
| | Description: Loblolly pine plantation planted in 1996, Plot LOB-88, located in the eastern portion of the tract. This stand has been thinned, while portions of it appear to have been impacted by pine bore beetles. |

Project Soter
Ridgeville, Berkeley County, SC

Photographic Log
 March 2015



| |
|---|
| Client: XXXXXXXXXXXX |
| Location: Center Line Road, Flag F-1 |
| Project No.: 6250-15-0079.02 |
| Date: 03.27.15 |
| Photo No.: 17 |
| Photographer: TAN |
| Description: Bottomland hardwood forest along an unnamed tributary to Mill Branch, southeast of the intersection of State Road 176 and Center Line Road. |



| |
|---|
| Client: XXXXXXXXXXXX |
| Location: Center Line Road, Flag F-8 |
| Project No.: 6250-15-0079.02 |
| Date: 03.27.15 |
| Photo No.: 18 |
| Photographer: TAN |
| Description: View of an unnamed tributary to Mill Branch from the bridge on Center Line Road. The stream is channelized and has been heavily altered from silviculture activities. |

Project Soter
Ridgeville, Berkeley County, SC

Photographic Log
 March 2015





| | |
|--|--|
|  | Client: XXXXXXXXXXXX |
| | Location: Center Line Road, Flag A-5 |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 19 |
| | Photographer: TAN |
|  | Description: View of wet loblolly pine plantation along the northeast corner of the Fish Road and Center Line Road intersection. |
| | Client: XXXXXXXXXXXX |
| | Location: Center Line Road, Flag P-39 |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 20 |
| | Photographer: TAN |
| | Description: View of wet loblolly pine plantation along western side of Centerline Road. This area is part of a wetland complex drained by Mill Branch. |

Project Soter
Ridgeville, Berkeley County, SC

Photographic Log
 March 2015



| | |
|--|---|
|  | Client: XXXXXXXXXXXX |
| | Location: Center Line Road, Flag B-30 |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 21 |
| | Photographer: TAN |
| | Description: View of loblolly pine clear-cut area along the eastern side of Center Line Road. This area is part of a wetland complex drained by Mill Branch. |
|  | Client: XXXXXXXXXXXX |
| | Location: Center Line Road, Flag L-18 |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 22 |
| | Photographer: TAN |
| | Description: View of bottomland hardwood forest on the west side of Center Line Road that drains to an unnamed tributary to Mill Branch. |

**Project Soter
Ridgeville, Berkeley County, SC**

Photographic Log
March 2015



| | |
|--|--|
|  | Client: XXXXXXXXXXXX |
| | Location: Center Line Road |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 23 |
| | Photographer: TAN |
| | Description: Intersection of Centerline Road and Interstate 26 (north side). Area consists of a loblolly plantation planted in 1973, Plot LOB-82, but now functions as non-alluvial swamp forest. |
|  | Client: XXXXXXXXXXXX |
| | Location: Center Line Road |
| | Project No.: 6250-15-0079.02 |
| | Date: 03.27.15 |
| | Photo No.: 24 |
| | Photographer: TAN |
| | Description: Intersection of Centerline Road and Interstate 26 (south side). Area consists of a wet loblolly plantation, portions of which were clear-cut in the winter of 2006/2007. |

ATTACHMENT B
NC WAM WETLAND RATING SHEETS

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Wet Loblolly Pine Plantation Date 03.26.15
Wetland Type Pine Flat Assessor Name/Organization Amec Foster Wheeler

| | |
|--|-----|
| Notes on Field Assessment Form (Y/N) | YES |
| Presence of regulatory considerations (Y/N) | NO |
| Wetland is intensively managed (Y/N) | YES |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | NO |
| Assessment area is substantially altered by beaver (Y/N) | NO |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | NO |
| Assessment area is on a coastal island (Y/N) | NO |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|---------------|
| Hydrology | Surface Storage and Retention | Condition | LOW |
| | Sub-Surface Storage and Retention | Condition | MEDIUM |
| Water Quality | Pathogen Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Particulate Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Soluble Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Physical Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Pollution Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| | Habitat | Physical Structure | LOW |
| | | Landscape Patch Structure | HIGH |
| | Vegetation Composition | Condition | NA |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|---------------|
| Hydrology | Condition | LOW |
| Water Quality | Condition | LOW |
| | Condition/Opportunity | LOW |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | MEDIUM |

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Wet Sweetgum Plantation Date 03.26.15
Wetland Type Hardwood Flat Assessor Name/Organization Amec Foster Wheeler

| | |
|--|-----|
| Notes on Field Assessment Form (Y/N) | YES |
| Presence of regulatory considerations (Y/N) | NO |
| Wetland is intensively managed (Y/N) | YES |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | NO |
| Assessment area is substantially altered by beaver (Y/N) | NO |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | NO |
| Assessment area is on a coastal island (Y/N) | NO |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|-------------|
| Hydrology | Surface Storage and Retention | Condition | LOW |
| | Sub-Surface Storage and Retention | Condition | LOW |
| Water Quality | Pathogen Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Particulate Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Soluble Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Physical Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Pollution Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| Habitat | Physical Structure | Condition | LOW |
| | Landscape Patch Structure | Condition | HIGH |
| | Vegetation Composition | Condition | LOW |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|------------|
| Hydrology | Condition | LOW |
| Water Quality | Condition | LOW |
| | Condition/Opportunity | LOW |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | LOW |

Overall Wetland Rating LOW

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Isolated Pond Date 03.26.15
Wetland Type Basin Wetland Assessor Name/Organization Amec Foster Wheeler

| | |
|--|-----|
| Notes on Field Assessment Form (Y/N) | YES |
| Presence of regulatory considerations (Y/N) | NO |
| Wetland is intensively managed (Y/N) | YES |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | NO |
| Assessment area is substantially altered by beaver (Y/N) | NO |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | NO |
| Assessment area is on a coastal island (Y/N) | NO |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|--------|
| Hydrology | Surface Storage and Retention | Condition | NA |
| | Sub-Surface Storage and Retention | Condition | NA |
| Water Quality | Pathogen Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Particulate Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Soluble Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Physical Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Pollution Change | Condition | HIGH |
| | | Condition/Opportunity | HIGH |
| | | Opportunity Presence? (Y/N) | NO |
| Habitat | Physical Structure | Condition | LOW |
| | Landscape Patch Structure | Condition | HIGH |
| | Vegetation Composition | Condition | MEDIUM |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|--------|
| Hydrology | Condition | MEDIUM |
| Water Quality | Condition | HIGH |
| | Condition/Opportunity | HIGH |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | LOW |

Overall Wetland Rating MEDIUM

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Mixed Pine-Hardwood Forest Date 03.26.15
Wetland Type Headwater Forest Assessor Name/Organization Amec Foster Wheeler

| | |
|--|------------|
| Notes on Field Assessment Form (Y/N) | <u>YES</u> |
| Presence of regulatory considerations (Y/N) | <u>NO</u> |
| Wetland is intensively managed (Y/N) | <u>YES</u> |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | <u>YES</u> |
| Assessment area is substantially altered by beaver (Y/N) | <u>NO</u> |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | <u>NO</u> |
| Assessment area is on a coastal island (Y/N) | <u>NO</u> |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|---------------|
| Hydrology | Surface Storage and Retention | Condition | LOW |
| | Sub-Surface Storage and Retention | Condition | HIGH |
| Water Quality | Pathogen Change | Condition | HIGH |
| | | Condition/Opportunity | HIGH |
| | | Opportunity Presence? (Y/N) | NO |
| | Particulate Change | Condition | HIGH |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Soluble Change | Condition | MEDIUM |
| | | Condition/Opportunity | MEDIUM |
| | | Opportunity Presence? (Y/N) | NO |
| | Physical Change | Condition | MEDIUM |
| | | Condition/Opportunity | MEDIUM |
| | | Opportunity Presence? (Y/N) | NO |
| | Pollution Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| Habitat | Physical Structure | Condition | LOW |
| | Landscape Patch Structure | Condition | HIGH |
| | Vegetation Composition | Condition | LOW |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|---------------|
| Hydrology | Condition | MEDIUM |
| Water Quality | Condition | HIGH |
| | Condition/Opportunity | HIGH |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | LOW |

Overall Wetland Rating **MEDIUM**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Bottomland Hardwood Forest Date 03.26.15
Wetland Type Bottomland Hardwood Forest Assessor Name/Organization Amec Foster Wheeler

| | |
|--|-----|
| Notes on Field Assessment Form (Y/N) | YES |
| Presence of regulatory considerations (Y/N) | NO |
| Wetland is intensively managed (Y/N) | YES |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | YES |
| Assessment area is substantially altered by beaver (Y/N) | NO |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | NO |
| Assessment area is on a coastal island (Y/N) | NO |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|---------------|
| Hydrology | Surface Storage and Retention | Condition | LOW |
| | Sub-Surface Storage and Retention | Condition | MEDIUM |
| Water Quality | Pathogen Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| | Particulate Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| | Soluble Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| | Physical Change | Condition | LOW |
| | | Condition/Opportunity | LOW |
| | | Opportunity Presence? (Y/N) | NO |
| | Pollution Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| Habitat | Physical Structure | Condition | MEDIUM |
| | Landscape Patch Structure | Condition | HIGH |
| | Vegetation Composition | Condition | MEDIUM |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|-------------|
| Hydrology | Condition | LOW |
| Water Quality | Condition | LOW |
| | Condition/Opportunity | LOW |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | HIGH |

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 4.1
Rating Calculator Version 4.1

Wetland Site Name Non-Alluvial Swamp Forest Date 03.26.15
Wetland Type Non-Riverine Swamp Forest Assessor Name/Organization Amec Foster Wheeler

| | |
|--|-----|
| Notes on Field Assessment Form (Y/N) | YES |
| Presence of regulatory considerations (Y/N) | NO |
| Wetland is intensively managed (Y/N) | YES |
| Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) | NO |
| Assessment area is substantially altered by beaver (Y/N) | NO |
| Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) | NO |
| Assessment area is on a coastal island (Y/N) | NO |

Sub-function Rating Summary

| Function | Sub-function | Metrics | Rating |
|---------------|-----------------------------------|-----------------------------|---------------|
| Hydrology | Surface Storage and Retention | Condition | MEDIUM |
| | Sub-Surface Storage and Retention | Condition | MEDIUM |
| Water Quality | Pathogen Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Particulate Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Soluble Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Physical Change | Condition | NA |
| | | Condition/Opportunity | NA |
| | | Opportunity Presence? (Y/N) | NA |
| | Pollution Change | Condition | MEDIUM |
| | | Condition/Opportunity | MEDIUM |
| | | Opportunity Presence? (Y/N) | NO |
| | Habitat | Physical Structure | MEDIUM |
| | | Landscape Patch Structure | HIGH |
| | | Vegetation Composition | MEDIUM |

Function Rating Summary

| Function | Metrics/Notes | Rating |
|---------------|-----------------------------|---------------|
| Hydrology | Condition | MEDIUM |
| Water Quality | Condition | MEDIUM |
| | Condition/Opportunity | MEDIUM |
| | Opportunity Presence? (Y/N) | NO |
| Habitat | Condition | HIGH |

Overall Wetland Rating **MEDIUM**

ATTACHMENT C
LOW GRADIENT STREAM ASSESSMENT DATA SHEETS

| LOW GRADIENT STREAM ASSESSMENT DATA SHEET | | | | | |
|---|---|--|---|--|--|
| Stream Name: Jurisdictional RPW | | Basin/Watershed: Four Hole Swamp | | USGS Quad: Pringletown | |
| Latitude: | | Longitude: | | County: Berkeley | |
| Date: 03.11.15 | | Time: 1330 | | Investigator: KP Haywood | |
| Stream width: 5 <input type="checkbox"/> 10 <input type="checkbox"/> | | Stream Depth: 3.0-5.0' | | Length of Stream Reach: 100' | |
| Has it rained within the past 48 hours? <input type="radio"/> YES <input checked="" type="radio"/> NO | | Adjacent land use? (Industrial, agriculture, etc): Silviculture | | | |
| Habitat | Condition Category | | | | |
| Parameter | Fully Functional | Partially Impaired | Impaired | Very Impaired | |
| 1.Epifaunal Substrate or Available Cover | Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are <u>not</u> new fall and <u>not</u> transient). | 30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization | 10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. | Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 2.Pool Substrate Characterization | Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common. | Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present. | All mud or clay or sand bottom; little or no root mat; no submerged vegetation. | Hard-pan, clay, or bedrock; no root mat or vegetation. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 3.Pool variability | Even mix of large-shallow, large-deep, small-shallow, small-deep pools present. | Majority of pools large-deep; very few shallow. | Shallow pools much more prevalent than deep pools. | Majority of pools small-shallow or pools absent. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 4.Sediment Deposition | Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 5.Channel Flow Status | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills > 75% of the available channel or < 25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 6.Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern | Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 7.Channel Sinuosity | The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.) | The bends in the stream increase the stream length 2-3X longer than if it was in a straight line. | The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line. | Channel straight; waterway has been channelized for a long distance. | |
| SCORE | 2.0 | 1.5 | 1.0 | 0.5 | |
| 8.Bank Stability | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. | Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion. | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars. | |
| SCORE | Left Bank 1.0 | 0.75 | 0.50 | 0.25 | |
| SCORE | Right Bank 1.0 | 0.75 | 0.50 | 0.25 | |
| 9.Vegetative Protection | >90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally | 70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than 1/2 of potential plant stubble height remaining | 50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than 1/2 potential plant stubble height remaining. | <50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height. | |
| SCORE | Left Bank 1.0 | 0.75 | 0.50 | 0.25 | |
| SCORE | Right Bank 1.0 | 0.75 | 0.50 | 0.25 | |
| 10.Riparian Veg Zone Width | Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal. | Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities. | |
| SCORE | Left Bank 1.0 | 0.75 | 0.50 | 0.25 | |
| SCORE | Right Bank 1.0 | 0.75 | 0.50 | 0.25 | |

Total Score: 7.5 NOTES/COMMENTS: