**Soter Mitigation – Response to Comments (SAC-2015-0476-SIR)**

**Comment: Please provide a statement regarding avoidance and minimization:**

**Response:** An extensive alternatives analysis was conducted by the applicant to evaluate practicable alternatives to the proposed site which limited wetland impacts to the greatest practicable extent and yet was feasible in light of technology, costs, and logistics.  Camp Hall Option 2 was selected as the preferred alternative, as it was technically feasible, provided efficient accessibility and visibility, and reduced wetland impacts to 293 acres.  Following site selection, the applicant further minimized wetland impacts by 75.15 acres to a total of 217.85 acres with Option 2A.  In this alignment the visitor's center/administrative offices were moved to an area of slightly lower visibility, but with greatly reduced wetlands impacts, the Phase 2 northern access road was completely removed to further reduce impacts, and the stormwater ponds associated with Phase 1 and 2 were relocated so that the site layout minimizes wetland impacts.

In addition, further minimization occurred in association with the design and planning of the Lower Westvaco Road access as a result of design enhancements and a detailed wetland delineation.  Impacts were further reduced from the original permit submittal (Option 2A) by 1.82 acres.  Further minimization of wetland impacts may result from additional design enhancements associated with infrastructure improvements.  Final design for these areas is on-going.

The applicant has also committed to installation to installation of additional culverts along the proposed road infrastructure corridors to prevent obstruction of existing surface flows during time of saturation within the wetlands and to facilitate the passage of terrestrial and aquatic organisms.

**Comment: Sara Brown, USACE Floodplain Management Project Manager, requested a statement which ensures the proposed work will not create backwater conditions on adjacent properties.**

**Response:**  The applicant proposes to install culverts at a maximum spacing of one culvert per 150 linear feet where wetlands currently exist adjacent (both sides) to the proposed road infrastructure corridors to prevent obstruction of existing surface flows during time of saturation within the wetlands and to facilitate the passage of terrestrial and aquatic organisms.  Culverts will have a minimum diameter of 18-inches and be installed at a slope of no less than .003-0.005 ft/ft, upstream invert to downstream invert, as required by Berkeley County or SCDOT, and be placed on grade with the adjacent topography.  In locations with ditches parallel to the proposed road, culverts will be appropriately designed, with a minimum diameter of 18 inches, to pass the 25-year storm event as per Berkley County requirements and will be installed at an appropriate grade to prevent scour within the existing ditches and meet cleaning velocities, as calculated, and be installed at a slope of no less than .003-0.005 ft/ft.  All culverts will be constructed of Reinforced Concrete Pipe (RCP), as required by Berkley County.

**Comment: The USFWS, in their comment letter, asked about establishing “protective buffers” around remaining wetlands.**

**Response:** In response to the USFWS concerns regarding the wetlands on the Project Soter development site that will remain, as well as the wetlands that will remain on the remaining portion of the Camp Hall site.

The majority of the wetland areas in the vicinity of the Project Soter development area have previously been converted to silvicultural use and the monoculture of loblolly pine is not sustainable over the long term.   The remaining wetland areas within the Project Soter development area will be incorporated into the site plan and designated for no development impacts.  The applicant will manage the remaining wetlands and uplands in a sustainable manner using normal forestry practices. This includes normal maintenance activities for existing roads and ditches.  Protective buffers will not be applied to the remaining wetlands.

The wetlands located on the remaining portion of the Camp Hall site, not included within the Project Soter development area, are to be addressed at a future time.  The landowner will manage the remaining wetlands and uplands in a sustainable manner using normal forestry practices including normal maintenance activities for existing roads and ditches.  Protective buffers will not be applied to the remaining wetlands at this time.

**USEPA Comment:** **In their comment letter dated May 15, 2015, the US Environmental Protection Agency stated that “The proposed mitigation plan indicates that several plant communities will be enhanced through planting and vegetation management techniques, including bottomland hardwood, pine flatwood, and isolated pond habitat. These communities require very different management (i.e., regular burning for pine flatwood) yet only a single vegetation performance standard is given.” And also “Performance standards should be tailored to each community.” The USEPA recommended “the applicant use an approach that has been formulated by the Alabama-Mississippi Mitigation Banking Review Team for Wet Pine Flats. This team suggests using the Functional Capacity Index of the Plant Community (FCIPLANT) derived from Rheinhardt, R.D., Rheinhardt, M.C., and Brinson, M.M. (2002), “A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Function of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains.”**

**Response:**  The applicant agrees with the USEPA that there is a need for specifically tailored performance standards for each enhancement prescription. The applicant proposes to use a hybrid performance standard which incorporates traditional mitigation performance standards as well as FCIPLANT in selected community types. Expanded wetland enhancement prescriptions are presented below with associated performance standards.

**Wetland Preservation**

Wetland preservation activities within the Mitigation Project is anticipated to protect approximately 890 acres of wetlands, as shown in Figures 11 – 11c in Appendix A of the Project Soter Mitigation plan. The proposed wetland preservation areas lie directly adjacent to many streams and generally consist of a mix of high quality bottomland hardwood forests communities. Wetlands within the Mitigation Project will be protected through the establishment of a conservation easement with a minimum 75 foot buffer (Bannister Tract, Dean Swamp Tract, and Mimms Tract) and generally a 100 foot buffer on the other tracts (Singletary, Long, and Salisbury).

**Wetlands Enhancement and Ecological Restoration**

Pine flatwoods/longleaf pine savannah enhancement

Greater than 15 year old Pine

Sections of the Bannister Tract and the Dean Swamp Tract that have stands of existing loblolly pine greater than 15 years old will be thinned to between 20 and 50 square feet of basal area/acre and will be placed under a prescribed burn schedule.  The following winter, the area also be will be underplanted with longleaf pine (*Pinus palustris*) seedlings. Thinning of the existing planted loblolly pine will be conducted to reduce the basal area to open the forest canopy to allow for the recolonization of herbaceous and under-planted longleaf pine. The prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed.

Pine flatwoods/longleaf pine savannah enhancement

Less than 15 year old Pine

Sections of the Bannister Tract and the Dean Swamp Tract that support stands of loblolly pine less than 15 years old will be thinned (to between 20 and 50 square feet of basal area/acre). Longleaf pine seedlings also will be underplanted in these stands.  A prescribed burn schedule will be implemented to mimic the natural burn cycle typical of this ecotype. Depending on the conditions and success of burned areas, the frequency of successive fires will be prescribed.

Pine flatwoods/longleaf pine savannah ecological restoration

The clear cut areas within the Bannister and Dean Swamp tracts will be burned, if feasible, during Monitoring Year 0 to reduce woody competition. The following late fall/winter, longleaf pine seedlings will be planted at a density of approximately 680 stems per acre. These areas will be placed into a burn regime with scheduled burns no greater than 3 years apart. Natural mortality of young seedlings is expected to reduce pine density over time to mimic natural, open grown stands. Thinning of pines may be required to prevent canopy closure.

Bottomland hardwood enhancement/ecological restoration

Sections of the Bannister Tract where the existing pine plantation have encroached into the bottomland hardwood communities located along Cedar Swamp, Sandy Run, and associated unnamed tributaries will be cleared and replanted with appropriate native hardwood species.  Once the site preparation activities are completed, the wetland area will be planted with appropriate bottomland hardwood species. Wetland trees will be planted at a density of 680 trees per acre (8’ x 8’ spacing).

Wetland depression ecological restoration

Depressional wetlands (ponds) which have recently been cleared by silvicultural activities will be planted with pond cypress (*Taxodium ascendens*) at a density of 300 saplings per acre. Fire will be allowed to enter the edges of both the replanted ponds and currently forested ponds located within existing pine plantations, during prescribed burns of the surrounding flatwoods/pine savannah, in order to reduce the prevalence of hardwood species on the pond margins.

**Success Criteria**

Due to the broad range of habitats that will be enhanced or ecologically restored, a mix of traditional survival rates and FCI scores will be used to determine the success of the mitigation effort of each community type.

Pine Flatwoods/Longleaf Pine Savannah Enhancement

The overall goal of the of the pine flatwoods/longleaf pine savannah enhancement (in both greater and less than 15 year old stands) is a reduction in loblolly pine stems, reduction in hardwood and shrub cover, and an increase in both longleaf pine and herbaceous species cover and diversity. Success criteria for the longleaf pine savannah communities will include:

* A reduction in loblolly pine stems to between 20 and 50 square feet of basal area/acre from pre enhancement levels;
* A reduction in both hardwood and shrub cover from pre enhancement levels. Hardwood & shrub cover will be no greater than 25% at the end of five monitoring years;
* Planted longleaf pine saplings will show a survival rate of at least 50% after 5 years, and overall increase in height and diameter. Mortality due to fire is expected and required for overall ecosystem stability;
* FCIPLANTS will show a general increase over time compared to pre-enhancement levels.

Pine Flatwoods/Longleaf Pine Savannah Ecological Restoration

Pine flatwoods/longleaf pine savannah ecological restoration will occur within areas were clear cutting of planted loblolly pines has recently occurred (excluding those areas which will be planted in either bottomland hardwood or wetland depression). The ecological restoration goal within this community type is the healthy establishment of longleaf pine seedlings, increase in herbaceous species diversity, and a lack of hardwood and shrub establishment. Success criteria for the flatwoods/longleaf pine savannah ecological restoration communities will include:

* Longleaf pine saplings will show a survival rate of at least 50% after 5 years, and overall increase in height and root collar diameter. Mortality due to fire is expected and required for overall ecosystem stability;
* FCIPLANTS will show a general increase over time compared to pre-enhancement levels.
* Hardwood & shrub cover will be no greater than 25% at the end of five monitoring years.

Bottomland Hardwood Forest Ecological Restoration

Vegetative monitoring documents a minimum of 320 planted stems per acre survive at the end of year 3, and 260 planted stems per acre survive at the end of year 5, and no more than 25 percent of any one species and no more than 1 percent invasive species. Height, lateral growth and diameter demonstrates an increase over baseline and each prior monitoring period. If volunteers are utilized to meet the set performance standards, species will be tagged in the field as a volunteer and the same data collected as for planted stems.

Wetland Depression Enhancement and Ecological Restoration

Wetland depression ecological restoration will occur within those depressional ponds that have been recently clear cut and enhancement will occur in currently forested ponds located within existing pine plantations. The ecological restoration goal within this community type is healthy establishment of pond cypress seedlings (within those areas which require planting), an increase in herbaceous species on the pond margins, and limited hardwood establishment. Success criteria for the wetland depression ecological restoration communities will include:

* Pond cypress seedlings will show a survival rate of at least 60% after 5 years, and an overall increase in height and diameter (within areas which require planting).
* FCIPLANTS (taken on pond margins) will show a general increase over time compared to pre-enhancement levels.
* Hardwood & shrub cover will be approximately 50% (acceptable range 30-70%) within the pond at the end of five monitoring years.