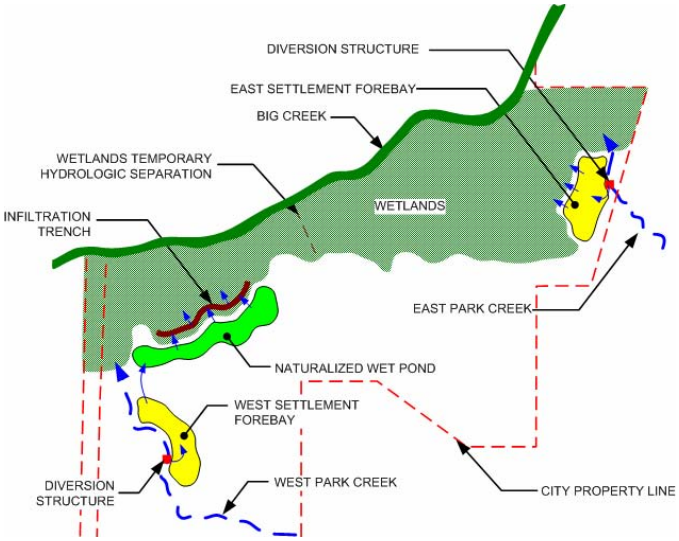
Big Creek Elementary School

Fulton County, GA (2007)

Background:

The Chattahoochie/Flint Regional Development Center applied for and received a grant from Georgia's Environmental Protection Division to conduct a scientific study with the Surface Mining Institute to design site erosion and sedimentation control features, which would become part of the permanent onsite stormwater management system at the school. That lead to the construction effort, called Big Creek Project, which was to intended to construct effective and inexpensive innovation erosion control measures to reduce TSS (mud).



Monitoring:

The Big Creek Project channels storm water into a system of collection areas – ponds and wetlands – where it's diffused into the water table through natural layers of grass and rock. Some of the water is carried by underground infiltration trenches where it, too, is returned to the water table. During construction a strict staging sequence of sediment controls, whereby the perimeter was completely secured first keeping the potential for offsite impact very low. This helped to also reduce construction costs. A logical treatment train at Big Creek involved the use of a seep-berm riparian zone system. The seep berm retained smaller storms, with further treatment from a passive sand filter possible for larger storms. Water seeping from the berm met the filter fence, which spread it and released it slowly to the forested riparian zone before it could reach the floodplain. Rather than determining the volume of water that needed to be managed and designing structures to manage that volume, the designers evaluated overall flows and infiltration capacity of the site and used energy reduction devices and materials to reduce runoff and promote infiltration.

Conclusions:

A series of monitors tracked the progression of stormwater flow through the system. Performance was exemplified by a high intensity storm that occurred while the site was near its peak level of disturbance. Total precipitation was 1.07 inches, with 0.70 inches occurring in 27 minutes near the end of the storm. Peak sediment concentration was measured at 160,000 mg/L. By the time the water emerged from the sand filter at the end of the treatment trains, sediment concentration had been reduced to 168 mg/L. Monitoring of the storm event showed that no sediment reached surface waters from this basin, which drained over half the site. Monitoring of larger storms showed comparable performance.

System addresses TSS only, no other water quantity or quality issues.