The City of Columbia Wastewater Consent Decree specifies that several Supplemental Environmental Projects (SEP) must be completed. The following is the Consent Decree language related to Phase I of the Gills Creek SEP:

> *During the initial phase of this project ("Phase I of the Gills Creek Project"), the City will implement the following projects in the Gills Creek Watershed:*
>
> 1) *Install a pocket wetland or other similar best management practice (BMP) at the end of Pelham Drive near where it meets Gills Creek Parkway;*
> 2) *Install a pocket wetland or other similar BMP at the end of Hampton Leas Lane where the road dead ends into the Gills Creek floodplain;*
> 3) *Install a pocket wetland or other similar BMP at the end of Tall Pines Circle where the road dead ends in the Gills Creek floodplain;*
> 4) *Install an erosion control BMP and outlet protection at the two major discharges entering the Gills Creek floodplain under Gills Creek Parkway;*
> 5) *Install a pocket wetland or other similar BMP at the end of Edmond Drive where the stormwater network drains to the Gills Creek floodplain (tax map number R13709-03-11); and*
> 6) *Install a pocket wetland or other similar BMP at the end of Hampton Trace Lane where the stormwater network drains to the Gills Creek floodplain (tax map number R13709-03-05).*

The projects to meet the above requirements have been completed. This report provides brief summaries and photos related to each of the project locations.

Site 1

A Manufactured Treatment Device (MTD) was selected for this site. The site is located at a 90 degree road turn, with a wide outside shoulder. Based on observation of the site and discussions with City Streets personnel, it was determined that vehicular traffic on the shoulder would prevent long-term success of a vegetated control on the surface. The subsurface MTD is well-suited to the site characteristics, and is installed online with the existing storm drains. It effectively treats low flows from the drainage area, while equipped to bypass larger flow volumes. Observations of the unit following rainfall events indicate the unit is functioning as designed.

Surface view of the Site 1 MTD

Interior view of the Site 1 MTD

Site 2

A combination wet pond and infiltration basin was selected for this site. Initially, the planned control for the site was a pocket wetland, with a series of shallow wetland pools spilling in series from the storm drain at the cul-de-sac to the wetlands bordering Gills Creek. Particularly sandy soils in the project location required an alteration of the initial plan. Slopes were laid back, weirs were made considerably more robust, and riprap armoring was introduced. The result was a pond/basin consisting of three pools in series.

Prior to installation of this control, a large storm drain carried water from the drainage area and emptied into an open ditch at the end of the cul-de-sac. The ditch, which had suffered significant erosion over time, carried the water directly from the storm drain outlet to Gills Creek. A junction box was installed near the outlet of the storm drain, equipped with a weir to divert low flows through the newly constructed pond. The diverted flows travel through an 18" RCP and empty into the first pool.

Broad rectangular weirs were constructed to regulate flow from pool to pool, and at the exit into the wetland. Under most low flow conditions, the first pool is expected to retain water at nearly full capacity, the second to retain water between half and full capacity, and the third to rarely retain water above half capacity. Treatment of low flows will be a combination of that expected from a wet retention pond and that expected in an infiltration basin. This control is well-suited to function fully as either a wet pond or an infiltration basin, though it is expected to serve as a combination of the two under most conditions.

Flow from a nearby hydrant was introduced to the pond upon completion, to test the functionality. Observations of the pond during this test indicate the pond is functioning as intended. The following photos were taken during the test.

View of the first and second pools, facing upstream

View of the first and second pools, facing downstream.

View of the third pool, facing downstream.

Site 3

A Manufactured Treatment Device (MTD) was selected for this site. This site is restricted primarily by the square footage available for installation of a water quality control. Water collected in the inlet at the end of the cul-de-sac is routed to the MTD for treatment prior to discharge into the adjacent wetland. The subsurface MTD effectively treats low flows from the drainage area, while equipped to bypass larger flow volumes. Observations of the unit following rainfall events indicate the unit is functioning as designed.

Surface view of Site 3 MTD and inlet

Interior view of Site 3 MTD

Site 4

Large riprap plunge pools were selected to serve as erosion control at the two locations, 4B and 4C (note: 4A was eliminated early in the planning process). The plunge pools are of sufficient size and depth to dissipate energy from high velocity flows through the outfalls. Observations following several rainfall events indicate the pools are functioning as designed.

Riprap plunge pool at Site 4B

Riprap plunge pool at Site 4C

Site 5

For this location, an enhanced filter swale was selected. Initially, a pocket wetland was planned for the site. However, upon evaluation, it was discovered that a majority of the land available for construction of a control was existing wetland. The storm drainage along the roadway emptied into a ditch prior to discharging into the existing wetland. An enhanced filter swale in place of the ditch was determined to be the best approach, filtering flow and reducing velocity between the pipe outfall and the wetland.

A subsurface vein of drainage stone was installed, then covered with additional stone and riprap. Low flows filter through the subsurface stone and empty into the riprap apron at the end of the swale. Larger flows will flow along the surface, over the riprap. Observations of the swale during low flows (which to date have remained constant), and after rainfall events, have indicated the swale is functioning as designed.

Upstream side of the swale at Site 5

Downstream side of the swale at Site 5

Site 6

A Manufactured Treatment Device (MTD) was selected for this site. This site is in the cul-de-sac of a residential neighborhood, and the MTD provided for a minimally noticeable alteration at the surface. This selection has been well-received by the occupants of the homes between which the unit was installed. The MTD is installed online with the existing storm drains, and effectively treats low flows from the drainage area while equipped to bypass larger flow volumes. Observations of the unit following rainfall events indicate the unit is functioning as designed.

Surface view of the Site 6 MTD

Interior view of the Site 6 MTD