EXECUTIVE SUMMARY

Introduction

In September 2003, Hillsborough County retained Ayres Associates Inc to update the Watershed Management Plan (WMP) for the Lower Sweetwater Creek (LSC), which was originally prepared in 2001. The main objective of this project is to perform water resources, natural systems assessment, Total Maximum Daily Load (TMDL), and water quality modeling for the watershed and prepare its supporting documents.

This study does not include the task of updating hydrological and hydraulic models for the watershed. As a result, Chapters 1 through 6 of this report remain for the most part, similar to the original version prepared in 2001. Throughout the report, where water quantity is discussed, this was generally left unchanged. Chapters 7 through 15 have been added to the report to reflect recent watershed conditions and studies performed during this study.

Based on the information collected and the analysis performed, a series of alternatives were developed to address water quality issues within the watershed. Chapter 15 presents the recommended projects for water quality improvement. In addition, a cost estimate for each recommended project was prepared. Since no hydraulic analysis could be performed, the accurate project sizing was not known. Therefore, project costs presented in this report may be subject to adjustments, depending on their actual size and detailed designs.

Existing Condition

The Lower Sweetwater Creek (LSC) Watershed is located in the Northwest part of Hillsborough County, and discharges into Old Tampa Bay. This watershed is approximately 10.5 square miles in area. It is one of the most heavily urbanized watersheds in Hillsborough County. It receives runoff from Egypt Lake and Town N' Country, as well as from areas within the jurisdiction of the City of Tampa, including Al Lopez Park, Drew Park, and Tampa International Airport.

The original study was completed in September 1998 and updated in FY2002 to reflect the drainage system improvement during previous 4 years. The 1998 study addressed the flooding problems within two main areas: Town N' Country and Peppermound Creek. The recommended or implemented Capital Improvement Projects (CIP) within the Town N' Country and Peppermound Creek include:

A. Town N' Country

The objective of the Town N' Country Long Term Solution is to provide 10-year level of service (LOS) flood protection for the homes and streets in the Town N' Country target area. Stormwater levels of service are defined in the Hillsborough County Comprehensive Plan, Stormwater Element and used in level of service analysis.

1. Phase I. Dam and Pump Station- Completed

Canal A is a tributary to Lower Sweetwater Creek and flows from west to east and ultimately outfalls into Lower Sweetwater Creek at its confluence with the Henry Street Canal. The Henry Street Canal (HSC) flows from east to west; modeling results show that under conditions that existed during the summer of 1995, floodwater from the HSC may have caused Canal A to flow backwards (from east to west). The first phase of the project was completed in May 1996. As an interim measure, the Lower Sweetwater Creek channel between Hillsborough Avenue and the Henry Street Canal was cleaned to reduce the resistance of flow to the Bay. A dam and pump station were constructed in Canal A to improve flood protection for the Town N' Country area west of Hanley Road during high frequency (low rainfall) events. These improvements are expected to lower the computed 25-year flood levels by approximately one half of a foot from 1993 conditions. The dam and pump station was planned, designed, and constructed during the twelve-month period following the flood.

2. Phase II. Stormwater Collection System Upgrade- Completed

As a second phase of the project, a portion of the stormwater collection system for Hanley Road has been upgraded. The upgrade includes the outfall pipe (with inlets) to a 43" X 68" ERCP which carries stormwater runoff from Hanley Road to Lower Sweetwater Creek. This phase of the project provides capacity and increases the effective drainage area served by the stormwater collection system. The County entered into a Joint Project Agreement with private property owners for implementation of this phase of the project. A 20' drainage easement has been dedicated to the County for this phase of the project.

3. Phase III. Berm Construction - Completed

As a third phase of the Long Term Solution, an effective berm had been completed between Lower Sweetwater Creek and Hanley Road from Hillsborough Avenue to West Comanche Avenue. The berm will prevent flood flows across certain low points between the Lower Sweetwater Creek channel and Hanley Road that would bypass the pump station in Canal A. The berm is an integral component of the pump station design and has been able to achieve the expected flood protection benefit of the pump station. The completion of phases I, II, and III are expected to collectively lower 25-year flood levels by approximately 0.8 feet from 1993 conditions.

4. Phase IV& V. Outfall to Sweetwater Creek - Completed

The fourth phase of the Long Term Solution consists of providing an additional outfall for the LSC watershed drainage area of Town N' Country west of the dam and pump station north of Hillsborough Avenue. This proposed project consists of two components. The proposed outfall would pump flow from Canal BN to Sweetwater Creek along Webb road via a 48" forcemain. The proposed alignment of the forcemain is along the Canal BN. This project would allow stormwater runoff to drain from both the box culvert and the pump station east of Hanley Road completed in Phase I. The second component (Phase V) includes crossings upgraded at Powhattan Avenue, Town N' Country Boulevard in order to prevent the significant headloss along these crossings. Phase VI and V had been completed during FY 1999-2000 to increase the level of flood protection for this area of Town N' Country.

B. Peppermound Creek

The objective of the Peppermound Creek Crossing Upgrade project is twofold:

1) The increase of conveyance capacity of the four (4) roadway crossings in the reach of the creek north of Memorial Highway is expected to reduce the headloss at these crossings and to reduce water surface elevations below the top of road for the 10-year/24-hour design event; and
2) The reduction of head loss in this reach of the creek is also expected to reduce the tailwater elevation for the Tanglewood/Gateway stormwater collection system. The Tanglewood/Gateway system is tailwater controlled and is therefore greatly influenced by the water surface elevations present in the Peppermound Creek between the road crossings of Tanglewood Lane and Glenview Lane.

1. Peppermound Creek Crossing Upgrade - Interim solution (pump station)

The proposed Peppermound Creek Crossing Upgrade includes improving the four crossings of the Creek upstream of Memorial Highway, including Tanglewood Lane, Glenview Lane, Springside Lane, and Winston Lane. Under current conditions, the conveyance capacity of Peppermound Creek is larger than that of the four road crossings. Improving the road crossing at Tanglewood Lane and Glenview Lane to 5' x 7' concrete box culvert (or equivalent) and improving Glenview Lane, Springside Lane, and Winston Lane to 5' x 10’ concrete box culvert (or equivalent) is expected to reduce hydraulic loss in this reach and to reduce 10-year computed water surface elevations to levels below the top of road level at these crossings. The proposed crossing upgrades should be implemented in a downstream to upstream order.

2. Tanglewood/Gateway Stormwater Collection System Upgrade - Interim solution (pump station) under design

The Tanglewood/Gateway stormwater collection system upgrade includes improving the entire collection system to 36" RCP or hydraulic equivalent. The increased flow area is expected to more efficiently convey flow thereby reducing headloss in the system and reducing water surface elevations. However, this project should not be implemented without the Peppermound Creek Crossing Upgrade Project. The Peppermound Creek project is an integral component of this project. Upgrading the Tanglewood/Gateway collection system without reducing the tailwater condition for this system is expected to have minimal or no benefit.

All five (5) phases of implemented CIPs within Town N’ Country area has been updated in 2002 existing condition report and model. An interim solution of pump station with berm for Peppermound Creek system is under design and will be completed in FY2003. The 2002 existing condition update also includes: model re-numbering, model calibration by using most recent storm events, data converting from all CAD files to GIS system, and delineation of 100-year flood plain.

This report will be updated when the digital one-foot contour data are available. This will enable to more accurately count the storage volume for model simulation and flood plain delineation.

C. Water Quality, Natural Systems, and TMDL Requirements

The assessment of existing water quality and natural systems for the watershed is presented in Chapters 7 and 8, respectively, while water supply issues are discussed in Chapter 9. The existing information was used to perform pollutant loading and removal modeling (Chapter 10). The modeling results were used to develop water quality level of service (LOS) that is discussed in Chapter 11. Public involvement process and survey of potential contaminant sources are described in Chapters 12 and 13, respectively. Subsequently, best management practices (BMPs) were developed to address existing water quality issues that are presented in Chapter 14. In selecting the location for final structural BMPs, attempts were made to identify and use available publicly owned properties. Additional exploratory site visits were also performed to examine the suitability of the sites for specific projects. Final recommendations along with individual preliminary cost estimates are presented in Chapter 15.

To meet water quality standards both the Federal (Clean Water Act [CWA]) and state (Chapter 62-302, Florida Administrative Code [F.A.C.]) rules apply, and certain actions must be taken to protect, restore, and maintain water quality. In addition, for the area of this project, discharges to surface waters are also regulated by the Florida Department of Environmental Protection (FDEP), Southwest Florida Water Management District (SWFWMD), Hillsborough County Environmental Protection Commission (HCEPC), and/or the US EPA, depending on types and magnitude of the discharge. Water quality assessment of the LSC and TMDL evaluations were conducted taken into considerations all the applicable regulations by collecting water quality data and using a water quality model described in Chapter 7. A brief summary is described below.

1. Overall Water Quality Level of Service (LOS)

Using an average score for all water quality parameters combined, the overall LOS score for the entire Lower Sweetwater Creek watershed was determined to be an F. The scores of F for total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) dominated the entire watershed, indicating that these parameters are the major water quality parameters of concern. This is due to the fact that the Lower Sweetwater Creek watershed is heavily developed and is primarily comprised of high density residential, commercial/services, industrial, and highway/utility land uses. These land uses contribute large quantities of various pollutants into surface water bodies. The low LOS score for the entire watershed (F) indicates that contiguous natural systems do not exist in the watershed that can treat the discharges before reaching the receiving waters because most subbasins have been highly developed and produce extensive loadings of pollutants.

Unless effective treatment measures are implemented, continued loading to surface waters in the watershed, and eventually into Old Tampa Bay, may result in significant water quality degradation. Efforts to reduce loading of pollutants to the Lower Sweetwater Creek, channels, lakes, sinkholes, and groundwater should be incorporated into future management activities for the watershed. Reduction of pollutant loading should include implementation of local and regional stormwater best

management practices (BMPs) to reduce or eliminate pollutant loading to receiving waters. To achieve this goal, a variety of BMPs, such as wet detention ponds, baffle boxes, alum treatment, improved wastewater treatment systems, and restoration of natural ecosystems may be used.

2. Natural System Conditions

The LSC watershed area is over 7,500 acres and contains plant communities, both terrestrial and aquatic, that provide a variety of important environmental functions. These functions include habitats for listed species and other wildlife, stabilization of stream banks and lake shores, improvement of water and air quality, and moderation of water and air temperatures. The plant communities in the watershed have undergone several periods of significant alteration since the 1830's as land use in the watershed have changed from original conditions to agriculture to the current suburban/urban uses. Land use changes have reduced the acreage of native plant communities, impaired water quality in streams, degraded many plant communities (e.g., invasion of non-native plants), and highly disturbed stream banks and lake shores. Most populations of native wildlife have been either reduced and/or eliminated. The changes to the natural system impact ecosystem behavior in ways that may alter water quality and viability of habitats. In order to remedy the adverse impacts to water quality, maintain healthy habitats, and meet the regulatory requirements, appropriate BMPs are recommended. Such recommendations are made based on the survey of existing natural conditions and water quality improvement goals.

3. Regulatory Background/TMDL

The Total Maximum Daily Load was originally promulgated as a part of the Federal Water Pollution Control Act and was later expanded by the Clean Water Act (CWA). The law requires states to define state-specific water quality standards for various designated uses and to identify water bodies that do not meet established water quality standards. Water bodies that do not meet such water quality standards as a result of human-induced conditions, are to be considered impaired.

In Florida, the TMDL process is multi-phased and includes identification, verification, and listing of impaired waterbodies, followed by the development and implementation of constituent-specific TMDL for different water quality parameters. FDEP issued its final report for LSC TMDL for fecal coliforms and nutrients in 2004 and as of writing of this report there are no approved TMDLs for LSC. However, public water supply requirements have impacted water levels/quality in both the surface water system and aquifers in the Tampa Bay region and TMDL development for receiving waters will be required in the near future.

4. Pollutant Loading and Water Quality Level of Service (LOS)

The gross pollutant loading within the watershed was estimated based on the 2004 land use and soils characteristics. The 2004 land use map indicated 10 different land use categories that were evaluated for the pollutant loading model. Water quality evaluations were performed by assessing 12 water quality constituents in receiving waters. Gross pollutant loading was estimated by assuming no treatment of stormwater runoff. This parameter indicates the potential of each land use in yielding contaminants into the environment. To approximate the net pollutant loading within

the watershed, the loading reduction due to the existing BMPs, was subtracted from the gross loading value for that watershed. Analyses were conducted at both watershed and subbasin levels. The details of these analyses are discussed in Chapter 10 of this report.

Based on these results, a water quality treatment level of service was determined at the subbasin and watershed levels within the Lower Sweetwater Creek watershed. This type of analysis facilitates prioritization of water quality improvement alternatives for the LSC watershed. Water quality treatment levels-of-service (LOS) criteria were used as part of this study to allow comparisons of existing and proposed stormwater treatment conditions to pollutant loading goals and to help prioritize alternative BMPs throughout the watershed.

Three water quality constituents were identified and analyzed in greater detail due to their importance in local water quality management programs. These parameters included total suspended solids, total phosphorus, and total nitrogen. In addition, based on specific concerns, some subbasins required assessment of other parameters, including heavy metals and bacteria. Excess nitrogen can stimulate algal growth resulting in reduced light penetration through the water column, resulting in loss of seagrass. Other factors that affect light availability in the Bay are also of concern, including excess total suspended solids. Excess phosphorous can promote eutrophication and algal blooms, leading to degradation of water quality. Results from the pollutant loading model were used to develop LOS for each water quality constituents that are fully described in Chapter 11 of this report.

D. Structural BMP Alternatives

Analyses were performed using GIS to strategically locate structural BMP sites for water quality and natural systems improvements. Various methods were used to identify feasible alternative projects for implementation that are described extensively in Chapter 14. Water quality conditions were evaluated using the County's Water Quality Treatment Level of Service criteria and pollutant loading model. The proposed alternatives are developed to improve water quality and natural systems consistent with the overall goals of the County.

Recent aerial photos were used to identify the most suitable and cost-effective sites for implementation of structural BMPs. The main criteria for site selection included proximity to streams/rivers (500-meter buffer zone), open areas, and publicly owned properties that are readily available for stormwater treatment in the form of retention or detention facilities. Initially a total of 41 locations for potential siting of structural BMPs are identified. Of the 41 potential sites, 30 fall within the 500-meter buffer of major streams. GIS analyses were performed to verify that the identified sites had no existing construction and were open areas suitable for construction of a stormwater treatment facility. The analysis showed that only 15 of the 30 identified sites met this criterion. Further GIS analyses were performed to identify the parcels that were publicly owned. This resulted in 6 sites that met all the criteria. These sites are recommended as potential structural BMPs locations based on the established criteria in this study. Site location, photos, maps and detailed preliminary cost estimates are described in Chapter 15. A brief summary of

each site and total costs are presented below:

1. Paula Drive

The proposed BMP site is 6 acres behind a shopping center owned by Hillsborough County. The Paula Drive site presented an ideal location for development of a stormwater treatment facility because the area is dominated by residential and built-up lands contributing large amounts of pollutants into the watershed's surface waters. A field visit confirmed that the site is already under development and will be the site of a public library. Based on its size and location, a water quality treatment system would provide much needed water quality improvement to the surrounding areas. The cost estimate for the treatment system will depend on the nature of the facility and will be determined when the County finalizes the specifics of the system to be built.

2. Kelly Road

The proposed site is 9 acres that can potentially contain an artificial water body (lake) and is the location of Sandy Perrone Park. A playground is located to the west of the maintenance building on the site. The western half of the parcel has a small forested patch. Inspection of the western half of the parcel identified a small natural wetland and two shallow basins of water – parts of a natural wetland. This wetland provides some treatment of the surface water in the watershed, but it could be greatly expanded and improved. The total cost for construction of an expansion to the wetland is approximately $300,000.

3. Tampa International Airport (TIA) Area

The proposed site is composed of a number of parcels ranging in size from 4 to 10 acres. It has a major stream flowing through the parcels and a wetland in the vicinity that can be expanded for stormwater treatment and storage. This site seems to be an ideal location for a large structural BMP. The size of the parcel, government ownership, lack of structures, and proximity to the major stream network makes it an ideal candidate for construction of a large treatment pond. Due to the site's proximity to the airport, permitting the construction might be an issue. Further investigation should be made regarding the opportunity for BMP construction on this parcel. The total costs of implementing the recommended BMP is estimated to be $1,416,000.

4. Hillsborough and Hoover intersection

The proposed site is 10 acres surrounded by industrial and commercial parks. A small wetland is also present in the vicinity that can be expanded to enhance natural system functions. The size and location of the site make it a perfect candidate for a large treatment pond. A small wetland is located in the southwestern corner of the parcel that can be expanded. There is a fence surrounding the wetland area, however the fencing has not been maintained and requires repairs to be functional. The total cost of structural BMPs at this site is estimated to be $1,383,800.

5. Occident Street

The proposed site is 16 acres surrounded by densely populated residential areas suitable for stormwater retention and wetland construction. This area is the site of West Dog Park. An open grassy area is located to the south of the park and already contains a small pond that is not

maintained. The pond is covered with grass and vegetation. While the area is not large enough for construction of an effective retention pond, the existing area may be improved and expanded to effectively treat the stormwater received from many neighboring residential communities and the West Dog Park located immediately to the north. The total costs for the expansion and development of stormwater treatment facility is estimated to be $532,000.

6. Hangar Court

The proposed site is two, 3 acre sites located on both sides of the street that can be used to construct wetlands or a stormwater treatment facility. The first parcel is approximately 3 acres in size and is located on the corner of Hangar Court and Hoover Boulevard, located along Channel G. The second parcel, which looks like an open field, is also approximately 3 acres, and is located on the other side of Hangar Court. The total cost of implementing the recommended BMPs at this site is estimated to be $300,000.

In addition to the structural BMPs enumerated above, there are various state and local agencies that provide educational and outreach materials for the public at large and academic institutions. The specifics of these educational programs are presented in Chapter 15.