EXECUTIVE SUMMARY

Introduction

In September 2003, Hillsborough County retained Ayres Associates Inc to update the Watershed Management Plan (WMP) for the Sweetwater Creek watershed, which was originally prepared in 2001. The main objective of this project is to perform water resources, natural systems assessment, Total Maximum Daily Load, 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 Sweetwater Creek Watershed is located in northwest Hillsborough County in west central Florida. The overall watershed area is approximately 21.0 square miles. The watershed is located in an area roughly defined by Pocahontas Ave on the south, Webb Road on the west, Florida Avenue on the east, and Crenshaw Lake Road on the north. Flow originates in the northern headwaters of the basin and flows in a generally southwestern direction to the basin outfall at the confluence with Rocky Creek, located approximately 1/2-mile downstream (west) of Webb Road.

The southern part consists of an improved channel system with a number of control structures fed by a system of urban ditches and storm sewer systems. Major drainage features in the watershed include the two main channels that cross the watershed in a southwest regime, Channels G and H, and over 25 major lakes, ponds and borrow pits of over 10 acres each. The largest of these lakes include Lake Carroll, Lake Magdalene, White Trout Lake, Lake Chapman, Platt Lake, Bay Lake, Lake Ellen, Lake George, Bird Lake, and Boat Lake. Three major segments define the drainage system of the Sweetwater Creek Watershed--Channel G, Channel H, and Upper Sweetwater Creek.

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 watershed 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.

Overall Water Quality Level of Service (LOS)

Using an average score for all water quality parameters combined, the overall LOS score for the entire watershed is an F. The scores of F and D for total nitrogen, total phosphorus, and TSS dominate the entire watershed. The Sweetwater Creek watershed is heavily developed and primarily comprised of various types of residential, commercial and services, industrial, and highway/utility land uses. These land uses contribute large quantities of a mixture of pollutants into surface water bodies. The overall low LOS score for the entire watershed (F) indicates that most subbasins have been developed and extensive contiguous natural systems do not exist in the watershed.

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 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.

Natural System Conditions

The Sweetwater Creek watershed area encompasses 13,570 acres in Hillsborough County. The watershed contains plant communities, both terrestrial and aquatic, that provide a variety of important environmental functions, including habitat for listed species and other wildlife, stability for stream banks and lake shores, improvement of water and air quality, and moderation of water and air temperatures. However, plant communities have undergone several periods of significant alteration since the 1830's as land use in the watershed changed from original conditions to agriculture to the current suburban/urban uses. Land use shifts have left the watershed with substantially less acreage in native plant communities, impaired water quality in streams, degradation of all plant communities by non-native invasive plants, and highly disturbed stream banks and lake shores. Most populations of native wildlife have been 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.

Regulatory Background/TMDL

The Total Maximum Daily Load (TMDL) 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. Sweetwater Creek has recommended TMDLs for nutrients, coliforms (total coliforms), and dissolved oxygen and Channel G has recommended TMDLs for nutrients and dissolved oxygen by FDEP. US EPA reports Sweetwater Creek TMDL development for dissolved oxygen and Channel G TMDL development for dissolved oxygen and nutrients have been scheduled for 2008. 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.

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 Sweetwater Creek watershed. This type of analysis facilitates prioritization of water quality improvement alternatives for the watershed. Water quality treatment levels-of-service 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.

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 48 locations for potential siting of structural BMPs were identified. Of the 48 potential sites, 41 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. We surmised that land prices within this watershed are reasonable and therefore the government ownership criterion may be relaxed. The analysis showed that only 11 of the 48 identified sites met two of the three criteria (buffer requirement, government

ownership, and open land). Further GIS analyses were performed to identify the parcels that were publicly owned. This resulted in 11 sites that met the 2 criteria. A field survey was conducted to examine the feasibility of placing BMPs at these 11 facilities. The survey indicated that all sites were feasible for stormwater treatment systems. 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. Dennison Road

This site is located adjacent to a residential property and is under private ownership. This site is mostly open, with a water feature located at the northern end of the property. While the open area of the site is sufficient for construction of a large retention pond, the wetland feature provides an opportunity for a wetland improvement/expansion project. The site is suitable for construction of a stormwater treatment and/or wetland expansion facility. The estimated cost of implementing such facility is $704,835.

2. Duque Road

This site contains some upland forested areas and a possible wetland system in the center of the parcel (presence of bald cypress dome). This site is mostly open, but some areas contain electrical towers. While the open area of the site is sufficient for construction of a large retention pond, the wetland feature provides an opportunity for wetland improvement and/or expansion project. This parcel is surrounded by agricultural and residential land uses that contributes large amounts of pollutants into the watershed's surface waters. Construction of a treatment facility at this location would provide much needed treatment to the surrounding areas. The estimated cost of implementing this facility is $1,222,404.

3. Avila Subdivision

This site is a partial wetland located at the exit of the Avila subdivision and is divided by Lake Magdalene Boulevard. Two wetland systems (one on each side of the road) are connected by a double pipe. While this site is dominated by natural land use types, it is outgrown by vegetation. This site presents a perfect opportunity for a wetland enhancement project. The parcel is surrounded by mostly agricultural and residential land uses that contribute large amounts of pollutants into the watershed's surface waters. Construction of a treatment facility at this location would provide much needed water quality treatment to the surrounding areas. The estimated cost of implementing this facility is $1,511,148.

4. Nebraska Avenue

This site consists of an undeveloped grassy parcel located near the junction of Nebraska Avenue and Florida Avenue. The site can be accessed via Lake Lane. The site contains some upland forested areas and a large wetland system in the center of the parcel. This site is mostly open and presence of surface water is noted. While the open area of the site is sufficient for construction of a large retention pond, the wetland feature provides an opportunity for wetland improvement or expansion project. This parcel is surrounded by agricultural and residential land uses that

contribute large amounts of pollutants into the watershed's surface waters. Construction of a treatment facility at this location would provide much needed treatment to the surrounding areas. The estimated cost of implementing this facility is $1,055,622.

5. Grady 1

Field inspection of this site indicated that the feasible alternatives would consist of one of two smaller forested/wetland parcels separated by the Sweetwater Creek watershed. The parcel is located at the end of the Grady Street, is heavily wooded, and contains a small canal or a ditch at the back of the property. Because the parcel is overgrown with vegetation, we were unable to access the site. Bald cypress domes are present in the center of the area and at the edge of the parcel indicating the existence of wetland or surface water within the parcel. This area demonstrates a potential for a wetland improvement project or construction of a large retention pond. The surrounding areas are mostly residential, contributing large amounts of various pollutants into the watershed's surface water. A stormwater treatment system at this location would provide much needed water quality treatment to the surrounding areas. The estimated cost of implementing this facility is $912,476.

6. Grady 2

Field inspection of this site confirmed that the potential alternatives would have to consist of one of two forested/wetland parcels separated by the Sweetwater Creek watershed. This area demonstrates a potential for a wetland improvement project or construction of a large retention pond. The surrounding areas are mostly residential, contributing large amounts of various pollutants into the watershed's surface water. A stormwater treatment system at this location would provide much needed water quality treatment to the surrounding areas. The estimated cost of implementing this facility is $2,222,044.

7. Himes

This site is a large open undeveloped grassy parcel located near the junction of Broad Street and Himes Avenue. A large retention pond can be found directly to the west of the site. The site does not seem to provide an opportunity for improvement or an expansion of an existing wetland. While the existing stormwater retention pond provides water quality treatment to the surrounding areas, excavation of the site in question may provide additional treatment. Surrounding parcels consist mostly of built-up and residential land use types that contribute large amounts of pollutants into the watershed's surface waters. This site provides an excellent opportunity for improvement and expansion of an existing stormwater treatment facility. The estimated cost of implementing this facility is $2,116,341.

8. Linebaugh

This site contains an undeveloped open parcel located at the southeast of Linebaugh Avenue and Anderson Road intersection. The site is undeveloped and is overgrown with vegetation, demonstrating existence of some exotic species of plants along its perimeter. A small business building is located at the south edge of the parcel. The open area of the site is sufficient for construction of a large retention pond and the wetland feature located to the west of the site

provides an opportunity for a wetland improvement and expansion project. This parcel is surrounded by industrial and residential land uses that contribute large amounts of pollutants into the watershed's surface waters. Construction of a treatment facility at this location would provide much needed treatment to the surrounding areas. The estimated cost of implementing this facility is $1,144,644.

9. Veterans

This site contains an undeveloped open parcel located to the west of the Veterans Expressway overpass over Sweetwater Creek. This parcel is adjacent to the Sweetwater Creek and is located at the back of a residential development. The open area of the site is sufficient for construction of a large retention pond. There is no wetland feature near the site that is suitable for a wetland improvement/expansion project. This parcel is surrounded by industrial and residential land uses that contribute large amounts of pollutants into the watershed's surface waters. Construction of a retention facility at this location would provide much needed water quality treatment to the runoff before it would enter Sweetwater Creek. The estimated cost of implementing this facility is $986,310.

10. Veterans - Park

This site is within 1/2 mile west of Site 9 described above. It has many of the same features and is suitable for a retention facility. Construction of a retention facility at this location would provide much needed water quality treatment to runoff before it would enter Sweetwater Creek. The estimated cost of implementing this facility is $2,945,276.

11. Armand

This site is a large undeveloped open parcel located at the corner of Armand Circle and Soccer Avenue. The site is located to the north of the Town'N'Country Greenway. This parcel is large in size; it is cleared with a forested portion to the east of the site. The parcel is a part of the Shimberg Park Sports Complex and is most likely used for such activities as soccer practice. A small trailer/mobile home, serving as an office, is located in the center of the parcel. The area is fenced out and is under private ownership. The location and size of the parcel make it a great site for a potential structural alternative. Surrounding areas mostly consist of residential land uses that contribute large amounts of pollutants into the watershed's surface waters. Construction of a retention facility at this location would provide water quality treatment to the runoff before it would enter Sweetwater Creek. The estimated cost of implementing this facility is $1,678,690.

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.