3.3 RECOMMENDED WATERSHED MAINTENANCE PLAN

Comprehensive, regular maintenance of stormwater management systems is essential to ensure the systems, once constructed, continue to function within their original design parameters for many years. Maintenance is also often required for aesthetics and safety reasons. This section outlines recommended maintenance practices and schedules for the Stevenson Creek Watershed.

Open Channels. Excessive vegetation and sediment accumulation can create new flooding problems, and worsen those problems which already exist. In some instances, excessive exotic invasive vegetation and sedimentation can inhibit the growth of beneficial flora and fauna. Excessive vegetation in open channels, particularly exotic or invasive species and plants with stiff, woody stems, can greatly increase the resistance to flow, thereby reducing the capacity of the channel to convey floodwaters and ultimately resulting in higher flood levels. Excessive sediment accumulation reduces the cross sectional area and hydraulic radius of the channel, creating a similar effect. In addition, sedimentation within concrete-lined channels can allow the growth of nuisance vegetation where none was assumed to exist in the roughness coefficients used original design calculations; as has occurred within the channel segment between Court Street and Pierce Street.

Proposed Watershed Management Plan Projects 1A, 1E, 1F, 2A, 4B, and 4C are improvements to the main channels that incorporate features that will allow improved access for maintenance, including approximately 4,000 linear feet of new maintenance access roads adjacent to Stevenson Creek and Spring Branch. These maintenance access ways typically consist of earthen roads that will facilitate equipment access for slope mowers, small dump trucks, and excavators. The width of the proposed access ways varies from 12’ to 25’ depending on the nature of the anticipated maintenance activities, whether access will be from one side or both sides of the drainage course, and the availability of land.

The recommended maintenance practice for open channels is mowing, and if necessary, hand removal of invasive vegetation. Spraying of herbicide should be used only in rare cases where lack of access and/or manpower prohibits the alternative methods. Any herbicide spraying should be conducted in compliance with the City of Clearwater National Pollutant Discharge Elimination System (NPDES) permit, which requires the implementation of a spray reduction program. The recommended maintenance type and frequency for each major open channel segment within the Stevenson Creek Watershed is presented Table 3.3-1.

Table 3.3-1 Recommended Channel Maintenance Plan

Channel Segment	Applicable Improvement Project	Recommended Maintenance Type(s)	Recommended Frequency
Stevenson Creek			
Stevenson Creek - US Alt. 19 to Douglas Avenue	Stevenson Creek Estuary Restoration Plan (U.S.A.C.O.E.)	Periodic removal of exotic and invasive plant species	Once every 2-5 years, or as needed
Douglas Avenue to Betty Lane	N/A	Periodic removal of exotic and invasive plant species	Once every 2-5 years, or as needed
Betty Lane to Proposed Sediment Sump Control Weir	Stevenson Creek Phase 1 (W.K. Daugherty Plans)	Initial dredging of accumulated sediment, periodic removal of exotic and invasive plant species	Once every 2-5 years, or as needed
Palmetto Street Sediment Sump	WMP Project 2A	Dredging	Annually
Palmetto Street to Drew Street	N/A	Periodic removal of exotic and invasive plant species	Once Every 2 years, or as needed
Drew Street to Pierce Street	Stevenson Creek Phase 1 (W.K. Daugherty Plans)	Periodic removal of accumulated sediment	Once every 5 years, or as needed
Pierce Street to Court Street	Stevenson Creek Phase 2 (CDM Plans)	Mowing	Semi-annually

Table 3.3-1 (Continued) Recommended Channel Maintenance Plan

Channel Segment	Applicable Improvement Project	Recommended Maintenance Type(s)	Recommended Frequency
Court Street to Druid Road	WMP Project 3A (Glen Oaks)	Mowing of embankment slopes and grassed areas	Monthly during the growing season
		Initial monitoring and maintenance of created wetland areas	Quarterly for the first year, Semi-annually thereafter, until beneficial vegetation is well established
Druid Road to Jeffords Street	Stevenson Creek Phase 2 (CDM Plans)	Repair vandalism damage to gabion walls	As needed
		Dredge sediment from Jeffords Street sediment sump	Semi-annually, or as needed
Jeffords Street to Lakeview Road	WMP Project 4A	Mowing	Semi-annually
Lakeview Road to Bellevue Boulevard	WMP Project 4B	Mowing	Semi-annually
		Removal of sediment from behind rock weirs	Annually, or as needed
Bellevue Boulevard to St. Thomas Drive	WMP Project 4C	Mowing of embankment slopes and grassed areas	Monthly during the growing season until tree canopy is established, semi-annually thereafter
		Removal of sediment from upstream of proposed Bellevue Blvd control weir	Annually, or as needed
St. Thomas Drive to Belleair Boulevard	N/A	None	N/A
Belleair Boulevard to South Ridge	N/A	Mowing	Semi-annually

Table 3.3-1 (Continued) Recommended Channel Maintenance Plan

Channel Segment	Applicable Improvement Project	Recommended Maintenance Type(s)	Recommended Frequency
Spring Branch			
Stevenson Creek to Douglas Avenue	N/A	Periodic removal of exotic and invasive plant species	Once every 2-5 years, or as needed
Douglas Avenue to Sunset Point Church	N/A	Jurisdiction of Pinellas County	N/A
Sunset Point Church to King's Highway	WMP Project 1A.1	Mowing	Semi-annually
Byram Pond	WMP Project 1E	Dredging	Annually
Byram Pond to Union Street	WMP Project 1F	Mowing	Semi-annually
Hammond Branch			
Stevenson Creek to King's Highway	N/A	Periodic removal of exotic and invasive plant species	Once every 2-5 years, or as needed
Flagler Drive Ditch, Highland Avenue to Keene Road	N/A	Mowing	Semi-annually
CSX Railroad north swale, Highland Ave. to Sharondale Drive	WMP Project 5A	Mowing	Semi-annually
Jeffords Street Branch			
600' west of Lake Ave to Lake Avenue.	WMP Project 7C	Mowing	Semi-annually
Proposed Pond at Barry Road and Tuscola	WMP Project 7C	Mowing of embankment slopes and grassed areas	Semi-annually
		Initial monitoring and maintenance of created wetland areas	Quarterly for the first year, Semi-annually thereafter, until beneficial vegetation is well established

In addition to the main channel segments listed in the above table, maintenance of the CSX railroad ditch that runs parallel to Maple Street, from Betty Lane to North

Greenwood Avenue is recommended. The City currently owns a narrow tract of land adjacent to the south side of the ditch that could be used for maintenance access. Regular maintenance of this ditch would alleviate a structure FPLOS deficiency at 512 Washington Avenue.

Created Wetlands and Littoral Shelves. Proposed Projects 1C, 2D, 3A, 6A, 7A, 7B, and 7C are improvements that incorporate created wetland and/or littoral shelf areas. Monitoring and maintenance of created wetland areas is recommended to ensure the success of the wetland plantings. Maintenance should be conducted quarterly for the first year, and semi-annually thereafter, until beneficial vegetation is well established.

Inlets and Control Structures. Curb and ditch-bottom inlets should be inspected at least annually for blockages due to vegetation, sediment, trash, etc, and for structural integrity and safety. Cleaning of existing and proposed catch basins, or water quality inlets, and CDS units should be conducted based on an established schedule. The City of Clearwater currently has two (2) vacuum trucks for this purpose, and is in the process of purchasing a third one. Periodic inspection of all existing and new water level control structures for structural integrity, safety, accumulated sediment, vegetation, and blockages should be conducted by qualified engineering staff. Vegetation and accumulated sediment should be removed as needed from around water level control structures to ensure their proper functioning.

Culverts and Storm Sewers. The Stevenson Creek Watershed contains many existing culverts and storm sewers that are several decades old. Most of these culverts are still in serviceable condition and do not require regular maintenance. Those that were identified to be in an obvious state of deterioration are recommended for replacement in one of the 28 recommended projects described in Section 3.1. However, all infrastructure is continually deteriorating, and culverts, storm sewers, and inlets should be inspected periodically (approximately every 3 to 5 years) to identify those in need of replacement. When culverts and storm sewers are identified for replacement, the design should be

evaluated to determine the appropriate size for the culvert to meet current design criteria for flood protection level of service.

Golf Course Best Management Practices. There are currently three golf courses within the Stevenson Creek Watershed. The two largest courses include the Clearwater Country Club Course and the Clearwater Executive Course. The third course is the Glen Oaks Golf Club, a small course that under this plan is proposed to be converted into a stormwater detention facility. Golf courses are some of the most highly maintained developed areas in the state. The expanses of turf grass, manicured landscaping, and sparkling blue water traps lead some people to think that because these areas are not paved, that they are beneficial to the environment. What most people don't realize is that a considerable amount of physical and chemical manipulation of the natural environment must be undertaken to create this illusion of perfection. The physical alterations include site grading and changing historic drainage patterns, removing native vegetation, and planting exotic, typically high-maintenance vegetation. The chemical manipulations include applications of:

- Fertilizers to help the exotic vegetation survive in the foreign environment,
- Insecticides to protect the exotic vegetation against predators for which they have no natural defense,
- Herbicides to reduce competition from other exotic species, and
- Fungicides to counteract the effects of the excessive amounts of water the exotic turf grasses require.

When these chemicals are used, the excess typically is found in surface and ground water, where they can be extremely detrimental to the environment. The effects of pesticides and fertilizers on surface and groundwater quality should motivate golf course operators to opt for application methodologies and the selection of substances with the least potential to cause water quality problems.

A comprehensive program of best management practices specifically for golf courses was developed by the University of Florida Institute of Food and Agriculture Sciences (IFAS). This program discusses ways to reduce or eliminate the need for

fertilizers and pesticides, and recommends more environmentally friendly substances to use when needed. Some of the recommendations include:

- Use native plants in the landscape. Native plants have adapted to the environment and require less water to survive. They also have natural defenses against many predators, which will reduce the need for pesticides. Native plants will also provide habitat for wildlife.
- There are turf grasses that have been developed for use on golf courses that are hardier and require less water and fertilizer. The Pinellas County Agricultural Extension Office has information on these newly developed grasses.
- Before using a pesticide, identify the target pest. This is essential for the selection of the proper pesticide to be used. Once the pest is identified, check with the IFAS to determine the recommended pesticides for that species. These recommendations will consider soil properties such as runoff potential, leaching potential, and the relative toxicity of the pesticide.
- The application methodology is an important factor to consider when using pesticides and fertilizers. Applications directly on the soil or incorporated into the soil will likely make more product available for leaching or runoff loss. Applications to foliage may lose some product to evaporation, absorption into the foliage, or decomposition in sunlight and thereby would reduce the amount available for wash-off and transport to water bodies.
- Create littoral shelves within the water traps and plant them with emergent aquatic vegetation. The vegetation will improve water quality and reduce the occurrence of algal blooms. Fewer chemicals will be needed to keep the water features clear.
- Use organic pesticides and fertilizers when possible. Many products have been developed especially for use on golf courses and have been tested successfully by the IFAS. Information on these products is available from the county extension service.