

# 1 *Stormwater Control and Treatment*

## **EXISTING CONDITIONS**

The topography of Pinellas County is mostly flat to gently sloping, characterized by sandy soils and high groundwater levels. Elevations range from sea level near the Gulf of Mexico and Tampa Bay, to 80 feet above mean sea level near Palm Harbor. Land use varies from densely urbanized in the south and south central portions of the County, to light development in the northeastern part of the County near Lake Tarpon and the Brooker Creek Preserve. Additional information on hydrologic conditions in Pinellas County, as well as a discussion of groundwater recharge characteristics, is found in the Natural Resource Conservation and Management Element as well as the Potable Water Supply, Wastewater and Reuse Element.

### **Existing and Projected Needs**

Pinellas County has an ongoing program to identify and correct stormwater management deficiencies. In addition to programming for major drainage/stormwater improvements, Pinellas County monitors system deficiencies causing minor flooding within residential developments and County roadways. There is also a Division within Public Works specifically charged with the project management, design and implementation of major and minor flood control and stormwater system projects.



***Flooding in a Pinellas County Community***

This Division is provided support by the County's Department of Environmental Management for projects related primarily to water quality improvement. In many cases, flooding problems are being eliminated or prevented by early detection and preventive maintenance. The Pinellas County Department of Public Works also keeps detailed records of residential and business complaints, and includes their own deficiency findings in order to prioritize, schedule and implement corrective measures.

Drainage deficiencies are frequently associated with street, or local, flooding. When a flooding incident is reported, and especially if the flooding represents a danger to the public, project priorities may shift. To accommodate the needed flexibility in project programming, the Departments of Public Works and Environmental Management have developed a project prioritization model. The project prioritization model considers the following variables: drainage severity, the number and type of flooding complaints, the nature of the flooding problem (e.g., pipe failure, erosion, etc.), related water quality impairment, opportunities for joint funding or joint project implementation, and the status of watershed planning for that

basin, etc. This model is not the County's Capital Improvements Plan (CIP), rather it is a flexible tool which can be re-run as needed, using the most current information, to help develop the CIP.

### **Physical Deterioration and Need for Replacement**

The County conducts a maintenance program which includes identification and correction of erosion problems before system failure occurs. In addition, with much of the County being close to build-out, and much of the drainage infrastructure being in place, issues associated with water quality and re-development are receiving increasing attention. Increasingly, it is the impact of physical deterioration of a drainage feature on surrounding water quality that may help direct a project, or a facility replacement or enhancement. For a County which is, to a large degree, economically dependent upon its water-based recreational and commercial amenities, water quality impairment associated with surface water runoff can have serious social and economic effects.

Regardless of how the problem is identified, the County evaluates each problem, formulates alternatives to remedy the deficiency, develops cost estimates and schedules the preferred alternative accordingly. In some cases, the project may be carried over from the MDP; in other cases, it is identified as a result of new information and new conditions.

**Table 1**, the Summary of Surface Water Management Improvements, represents the list of surface water improvements completed from Year 1996 through 2007. A comprehensive inventory of projects that are being planned and scheduled through 2013 can found in the Implementation section of this Element. Project scheduling and specific costs are addressed in the Capital Improvements Element. Not only are projects directed at drainage/flood control deficiencies described, but projects and plans necessary to meet the County's other surface water management goals are included as well, such as water quality improvement, watershed management planning initiatives, drainage channel erosion control projects, stormwater system rehabilitation projects, and drainage pond enhancements. The projects identified are largely projects to be completed within the unincorporated County, or projects to be jointly funded with other jurisdictions or agencies.

### **Watershed Inventory Summary**

The Watershed Inventory, included as **Appendix A**, incorporates updated basin/watershed data for all 52 drainage basins, or watersheds, within the County, including revised data on land use types and land use percentages by basin or watershed.

### **Operating entities**

Pinellas County is the operating entity for the completed improvements identified in **Table 1** and for the planned improvements identified in **Table 6**, unless otherwise noted.

**TABLE 1**  
**SUMMARY OF COMPLETED SURFACE WATER MANAGEMENT IMPROVEMENTS**  
**Years 1997 through 2007**

<b>PROJECT TITLE AND TYPE</b>	<b>BASIN</b>
Anchorage at Lake Tarpon	3
Roosevelt Creek Tributary #5 at 100th Ave. (#921564)*	23
Curlew Creek Channel A (#921488)	10
Alligator Creek Channel A Detention at Logan St. (#1171)	14
Allen's Creek Floodplain Restoration at Lakeview & Hercules (#921810)	19
Long Branch Stormwater Pond (#	22
Starkey Road Basin Tributary 7 Channel Improvements (#	25
Starkey Road Channel #7 (#921349)	25
Ridgewood Circle Drainage Improvement (#921692)	26
Lake Seminole Pond Creation Sub-basin #6 (#921817)	26
Lake Seminole Control Structure (#921819)	26
Lake Seminole Pond Refurbishment Sub-basin #6 (#921820)	26
McKay Creek Channel Improvements (#	27
McKay Creek Improvement, Walsingham to Ulmerton Rd.	27
Currie Lane Drainage Improvements	28
Oakhurst/Boca Ciega Park Drainage Improvement (#922139)	28
Oakhurst/82nd Terrace Outfall (#921276)	28
115th Lane at Irving Drainage Improvements (#922026)	28
Sawgrass lake Park Pond Tributary #7 Improvement (#921625)	30
54th Ave. N. at 58th St. N. Drainage Improvements	35
Miles Creek Channel Improvement (#921860)	35
31st St. N. Storm Sewer (#921978)	35
37th St. Culvert (#922034)	35
38th Ave. Pipe Replacement	42
Alligator Creek Watershed Drainage Improvements Phase I	14
82nd Ave. Drainage Improvements-131st St. N. to Oakhurst Rd.	28
Allen's Creek Habitat/Floodplain Restoration at Lancaster Dr., Area #1	19
Allen's Creek Habitat at Lancaster Dr. Area #2	19
Bayside Bridge Treatment Pond Reconstruction	21
Ft. DeSoto Water Circulation Improvement (#921573)	26
Wetland Rehabilitation at SPC (#922135)	26
Allen's Creek Management Plan (#921499)	19
Lake Seminole Management Plan (#921569)	26
Alligator Creek Management Plan (#921609)	14
Possum Branch Channel H	11
NPDES Characterization Study (#921719)	Co.wide
USGS Engin. Hydrologic Studies (#125)	Co.wide
Right-of-Way Reserve (#159)	Co.wide
Stormwater System Rehabilitation (#921321)	Co.wide
Stormsewer Pipe Lining and Repair (#921358)	Co.wide
Stormwater Projects Permit Monitoring (#921774)	Co.wide
Surface Water Data Collection (#922136)	Co.wide
Drainage Pond Enhancements (#922144)	Co.wide
Coastal Habitat Restoration and Protection (#922145)	Co.wide

Source: Pinellas County Public Works and Pinellas County Capital Improvements Program, 2007.

\*Indicate project ID numbers, where such numbers were available.

## Proportional Capacity of Stormwater System

**Table 2**, the Watershed Jurisdictional Summary, identifies which jurisdictions have responsibility in which watershed. This list also indicates what percentage of the basin/watershed represents a County drainage contribution versus that of another local government.

**TABLE 2  
WATERSHED JURISDICTIONAL SUMMARY**

<b>WATERSHED</b>	<b>BASIN NUMBER</b>	<b>PERCENTAGE COUNTY</b>	<b>PERCENTAGE OTHER JURISDICTION</b>	<b>TOTAL ACRES</b>
Anclote River	1	62.24%	Tarpon Springs (37.76%)	8743.8
Klosterman Bayou	2	88.72%	Tarpon Springs (11.28%)	2050.1
Lake Tarpon Basin	3	83.47%	Tarpon Springs (16.53%)	6965.4
Brooker Creek	4	90.23%	Oldsmar (9.77%)	9978.8
Oldsmar	5	24.25%	Oldsmar (75.75%)	2346.5
South Creek	6	91.35%	Clearwater (3.83%), Oldsmar (4.82%)	2840.5
Sutherland Bayou	7	100%	N/A	1506.7
Smith Bayou	8	89.77%	Dunedin (10.23%)	1841.3
Cedar Creek	9	1.63%	Dunedin (98.37%)	1235
Curlew Creek	10	54.36%	Clearwater (21.06%), Dunedin (24.58%)	6718.4
Possum Branch	11	4.52%	Clearwater (56.5%), Oldsmar (16.89%), Safety Harbor (22.09%)	1926.6
Bishop Creek	12	14.09%	Clearwater (26.54%), Safety Harbor (59.37%)	864.5
Mullet Creek	13	16.38%	Clearwater (20.63%), Safety Harbor (62.99%)	1951.3
Alligator Creek	14	30.80%	Clearwater (63.79%), Safety Harbor (5.41%)	5606.9
Spring Branch	15	10.10%	Clearwater (29.25%), Dunedin (60.65%)	2124.2
Coastal Zone 4	16	0.02%	Clearwater (16.40%), Dunedin (83.57%)	872.7
Coastal Zone 1	17	10.13%	Belleair (38.78%), Belleair Bluffs (4.05%), Clearwater (36.66%), Largo (10.39%)	2840.5
Stevenson's Creek	18	15.52%	Clearwater (82.56%), Largo (1.92%)	3877.9
Allen's Creek	19	31.28%	Clearwater (34.29%), Largo (34.43%)	4890.6

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Coastal Zone 2	20	9.60%	Clearwater (90.4%)	864.5
Coastal Zone 3	21	6.86%	Clearwater (55.09%), Safety Harbor (62.99%)	1704.3
Long Branch	22	41.10%	Largo (58.90%)	1803.1
Roosevelt	23	28.66%	Largo (0.03%), Pinellas Park (19.79%), St. Petersburg (51.52%)	7978.1
Cross Bayou	24	47.61%	Largo (19.24%), Pinellas Park (31.79%), Seminole (1.35%)	7681.7
Starkey Road	25	30.64%	Largo (32.29%), Clearwater (0.02%), Pinellas Park (1.30%), Seminole (35.75%)	10448.1
Lake Seminole Basin	26	11.13%	Largo (11.46%), Madeira Beach (0.19%), Seminole (35.62%)	5063.5
McKay Creek	27	42.84%	Belleair Bluffs (3.12%), Largo (46.11%), Seminole (7.93%)	5631.6
Coastal Zone 5	28	87.69%	Largo (9.01%), Madeira Beach (0.94%), Seminole (2.36%)	4124.9
Pinellas Park Ditch #1	29	12.52%	Pinellas Park (87.48%)	2741.7
Sawgrass Lake	30	20.80%	St. Petersburg (38.65%), Pinellas Park (40.56%)	5878.6
Tinney Creek	31	24.77%	St. Petersburg (75.23%)	1951.3
NE St. Petersburg	32	0	St. Petersburg (100%)	2000.7
70th Ave North Canal	33	0	St. Petersburg (100%)	1185.6
54th Ave. East Canal	34	0	St. Petersburg (100%)	1843.4
Joe's Creek	35	14.40%	Kenneth City (5.14%), Pinellas Park (14.68%), St. Petersburg (41.86%)	9262.5
Long Bayou	36	36.76%	Seminole (6.08%), St. Petersburg (57.16%)	1852.5
Pasadena Lake	37	0	St. Petersburg (100%)	1185.6
SW St. Petersburg	38	0.39%	South Pasadena (46.80%), St. Petersburg (52.82%)	419.9

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Bear Creek	39	4.75%	Gulfport (13.74%), St. Petersburg (79.31%), South Pasadena (2.20%)	2815.8
Booker Creek	40	0	St. Petersburg (100%)	3136.9
North Coffee Pot Bayou	41	0	St. Petersburg (100%)	568.1
45th Ave. N.E. Canal	42	0	St. Petersburg (100%)	1432.6
Coffee Pot Bayou	43	0	St. Petersburg (100%)	765.7
Albert Whitted	44	0	St. Petersburg (100%)	1383.2
34th Street	45	0	Gulfport (7.42%), St. Petersburg (92.58%)	1630.2
Clam Bayou	46	0	Gulfport (0.99%), St. Petersburg (99.01%)	617.5
Gulfport	47	6.66%	Gulfport (79.58%), St. Petersburg (13.76%)	1729
Frenchman's Creek	48	0	Gulfport (0.39%), St. Petersburg (99.61%)	2445.3
Lake Maggiore/Salt Creek	49	0	St. Petersburg (100%)	3062.8
Big Bayou	50	0	St. Petersburg (100%)	938.6
Little Bayou Creek	51	0	St. Petersburg (100%)	505
Pinellas Point	52	0	St. Petersburg (100%)	864.5

\*Does not include acreages of Lake Maggiore, Lake Seminole or Lake Tarpon.

\*Source: Pinellas County Department of Environmental Management, 2007.

**Demand** is estimated based on existing and projected development activity in the basin. Existing conditions, including existing land use, within each drainage basin are summarized in **Appendix A**, the Watershed Inventory Summary. However, specific demand on a proposed facility is calculated at the time of project design. As the individual watershed plans are developed, both existing and future land use information is included as a part of the modeling.

### **Design Criteria**

The County designs each individual stormwater project to meet the adopted level of service standards for stormwater control and treatment. For stormwater control, design is determined by the application of the 25 year 24 hour storm event. This standard is applied by both Pinellas County and the Southwest Florida Water Management District.

In addition, as a part of their design process, County staff incorporates standards for ponds that result in a more aesthetically pleasing pond and provide, or enhance, wildlife habitat value. Additionally, each project is designed to meet all regulatory stormwater treatment requirements, as described in the Regulatory Framework section of this Element.

## **LEVEL OF SERVICE STANDARDS FOR STORMWATER CONTROL AND TREATMENT**

The level of service standards for stormwater control and treatment are as follows:

All applicable federal, state and local regulations (as indicated in the Regulatory Framework Section of the Surface Water Management Element) relating to flood control, stormwater treatment, and wetland protection shall continue to be met in public and private project design.

The twenty-five year storm design standard shall confine the runoff from a twenty-five year twenty-four hour rainfall event, within drainage channel banks, or within designated twenty-five year floodplains, in order to protect human life and minimize property damage.

The one-hundred year storm design standard shall protect homes and commercial buildings against flooding by a one-hundred year twenty-four hour rainfall event.

In addition to addressing major drainage requirements, the Comprehensive Plan is also including specific requirements that address the impacts of private development on the stormwater system, Pinellas County will also now require that private development demonstrate that it will not adversely impact off-site conveyance and treatment systems. There are instances where the use of fill or altered natural flow patterns result in inadvertent impacts to neighboring properties or the stormwater system.

## **REGIONAL STORMWATER TREATMENT FACILITIES**

Pinellas County realizes that requiring each site to create an individual stormwater treatment structure is not always the most efficient use of a property. Single-family residential areas and small commercial sites simply may not be large enough to use traditional methods of stormwater management to ensure that their sites are in compliance with standards. Regional stormwater facilities may present an option for such instances, when a site is too small to construct a stormwater pond or for single-family residential areas. Mitigation banking could provide funding for the County to construct and maintain regional stormwater facilities, so that there would still be a net environmental benefit derived from development, for which standard stormwater treatment methods may not be feasible. Such systems would collect and treat stormwater from a larger area and individual, small sites, would be able to pay into the mitigation bank to fund a stormwater treatment facility that could benefit an entire neighborhood. However, because Pinellas County is almost built-out, the idea of regional stormwater facilities may not be feasible, as there are few locations large enough where such facilities could be installed.

## **FUTURE CONDITIONS**

Future stormwater needs are not determined strictly by population. Ultimate land use conditions incorporating ultimate development are the primary data input for the computer model which simulates future conditions for the identification of future needs. Knowledge of local development patterns and the expertise of engineering and environmental staff are also

utilized, in conjunction with computer modeling and planning data, to make reasonable determinations about future conditions. This information is modeled and then interpreted using the established drainage design standards and other relevant criteria. This allows, for example, for the identification of future drainage facilities and improvements in consideration of those areas with the potential to experience the greatest development. However, existing stormwater management facilities will be utilized whenever possible, maximizing the capacity of each existing facility. As Pinellas County is nearing a state of build-out, significant future population growth is not anticipated and urban sprawl is not a primary issue within the County. Future stormwater needs in the County will be based upon redevelopment practices. As many sites are being redeveloped to higher densities than their previous uses, they will need to be designed so that they meet current stormwater standards to ensure that the stormwater system is not overwhelmed by increased impervious surfaces and increased numbers of people. All redevelopment will also need to be consistent and reviewed against any adopted and relevant watershed management plan, as these contain the most up-to-date and reliable source of information related to current conditions within the watershed and how development may impact surface water quality and quantity.

Future needs will also need to consider the impact of the Total Maximum Daily Load program. As waterbodies are assigned TMDLs, it will be up to the County and the various municipalities to ensure that the assigned TMDLs are met, so that fines are not levied and that water quality improves. Once waterbodies under the jurisdiction of the County are assigned TMDLs, the County will need to assess each one and determine what measures should be taken to ensure that the assigned TMDLs are met. This program will have a significant impact on the surface water management program for the unincorporated areas of Pinellas County and on the County's CIP project lists.