

SECTION 7

REGULATORY REVIEW

CITY OF COCOA BEACH, FLORIDA
STORMWATER MASTER PLAN

 **PARSONS ENGINEERING SCIENCE, INC.**

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SECTION 7 REGULATORY REVIEW

This section provides a review of current City, State and Federal regulations and recommends modifications to the City of Cocoa Beach's Land Development Regulations. In addition, this section addresses the adequacy of authority to regulate development activities that affect stormwater runoff, the adequacy compliance procedures, and adequacy of enforcement resources.

7.1 MAJOR THEMES FOUND IN CURRENT STORMWATER REGULATIONS

Federal Regulations

The Federal government has a long history as the "rule-maker" and "watchdog" of national water resources. In 1987, the Water Quality Act included requirements to control storm water discharges. Three years later, in the National Water Quality Inventory Report to

Congress, USEPA stated that one third of U.S. waterways were "impaired" by stormwater runoff. Since that time, revised EPA reports state that polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards.

Mandated by Congress under the Clean Water Act, the NPDES Storm Water Program is a comprehensive two-phased national program for addressing the non-agricultural sources of stormwater discharges that adversely affect the quality of our Nation's waters. The Program uses the National Pollutant Discharge Elimination System (NPDES) permitting mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by storm water runoff into local water bodies.

Regulations should include the designation of Best Management Practices (BMPs) to support activities and maintenance procedures that will prevent or reduce the pollution of water. BMPs include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw sewage. BMPs include structural devices or nonstructural practices. A wealth of information is available through EPA documents and websites on best management practices. References to EPA documents are included in the Appendix of this document.

The City of Cocoa Beach's Phase 2 NPDES Permit coincides with the turnover by the Federal Government of specific authority and responsibility to the Florida Department of Environmental Protection ("FDEP"). This authority extends to the review, issuance and monitoring of Phase 2 NPDES permits. Together with the FDEP, the St. Johns River Water Management District ("SJRWMD") will be the NPDES authority, with responsibility to oversee, negotiate and mediate TMDL issues and the establishment of Pollution Load Reduction Goals ("PLRGS").

7.1.1 SJRWMD Regulatory Authority

The SJRWMD has development permitting control, except where the Coastal Control Construction Line ("CCCL") is an issue. CCCL permitting will continue to be the responsibility of the FDEP. The criteria found in Chapter 40C-42, Florida Administrative Code ("F.A.C.") is used for the evaluation on environmental resource stormwater permit applications by the SJRWMD. Other criteria for evaluation has been developed from guidelines established in the following chapters:

Chapter 373,F.S.	Water Resources Act of 1972
Chapter 403,F.S.	Environmental Control
Chapter 62-25, F.A.C.	Regulation of Stormwater Discharge
Chapter 62-40, F.A.C.	State Water Policy
Chapter 40C-4 F.A.C.	Environmental Resource Permits: Surface Water Management Systems
Chapter 40C-40, F.A.C.	Standard General Environmental Resource Permits
Chapter 40C-41, F.A.C.	Environmental Resource Permits; Surface Water Management Basin Criteria
Chapter 62-3, F.A.C.	Water Quality Standards
Chapter 62-302, F.A.C.	Surface Water Quality Standards

A handbook, based on the criteria named above, has been developed by SJRWMD for use in regulating stormwater management systems. It contains BMP-specific criteria and Illustrations of recommended design of BMP structures. These include oil skimmers for typical outfall structures, conceptual design for multi-stage outlet structures, on-line treatment systems, diversion boxes, various dry detention facilities, pond configurations and retention facility cross sections. The handbook narrative topics includes erosion and sediment control requirements, oil and grease control mechanisms, public safety requirements for basin side slopes and control structures, maintenance easement requirements, and criteria for stormwater design components, such as "tailwater" at final discharge, peak discharge attenuation and the selection of the design storm used to determine the requirements of the detention basin.

SJRWMD criteria for general permits for stormwater management systems utilizing dry detention are limited to systems within project areas less than 5 acres in size, or that serve drainage areas less than 5 acres in size. The design and performance criteria for these dry detention systems include treatment volume, recovery time, outlet structures, ground water table, control elevation, basin stabilization, basin configuration, inlet structures and maintenance for removal of sediment and debris from the basin.

Other Jurisdictional Responsibilities and Authority

A major task to be accomplished by FDEP is the administration of the NPDES Permit program, which places a large burden on FDEP manpower and technical resources. Smaller communities, such as the City of Cocoa Beach are encouraged to apply as a co-applicant to lessen the burden of permit review on the FDEP offices. It can be anticipated that a decision to apply as a "co-applicant", rather than as an individual reporting entity, will also guarantee lower application costs and permit fees. The State of Florida has the expectation

that Cocoa Beach will be a co-applicant with other Brevard County cities on the Brevard County permit application.

As many areas of water resource responsibility are transferred to the FDEP, it is possible that future Federal authority will be limited to development permitting within wetlands/habitat. Surface water spills will continue to be handled by the United States Coast Guard.

State Department of Environmental Protection Regulations

Rules of the FDEP are organized into several program areas. These rules have been developed over the past decade. It is recommended that local regulations dovetail by rule and reference to the major FDEP program area rules that are listed below. The goal is to set local regulations that will prohibit activities that do not meet FDEP rules.

General Department Rules

Chapter 62-43 Surface Water Improvement and Management Act (1990)
Chapter 62-104 Administrative Procedures for the Water Resources Restoration and Preservation Program (1996)

Aquatic Plant Management Rules

Chapter 62C-20 Aquatic Plant Control Permits (1996)

Beach Management Rules

Chapter 62B-33 Rules and Procedures for Coastal Construction and Excavation (1998)
Chapter 62B-41 Rules and Procedures for Application for Coastal Construction Permits (1996)

Ground Water Rules

Chapter 62-624 Municipal Separate Storm Sewer Systems (new)

Law Enforcement Rules

Chapter 62N-16 Pollutant Discharge Act (1996)

Surface Water and Wetland Rules

Chapter 62-4 Permits (2000)
Chapter 62-25 Regulation of Stormwater Discharge (1995)
Chapter 62-301 Surface Waters of the State (1996)
Chapter 62-302 Surface Water Quality Standards (1996)
Chapter 62-312 Dredge and Fill Activities (1998)
Chapter 62-330 Environmental Resource Permitting (1996)
Chapter 62-342 Mitigation Banking (1995)
Chapter 62-343 Environmental Resource Permit Procedures (1998)
Chapter 62-344 Delegation of the Environmental Resource Program to Local Governments (1995)
Chapter 62-624 Municipal Separate Storm Sewer Systems (new)

7.1.2 Water Management District Rules Adopted by Reference by FDEP and Operating Agreements between FDEP and St. Johns River Water Management District

SJRWMD rules include the following program areas:

Chapter 40C-4	Environmental Resource Permits: Surface Water Management Systems (1995)
Chapter 40C-40	Standard General Environmental Resource Permits (1995)
Chapter 40C-41	Surface Water Management Basin Criteria
Chapter 40C-42	Regulation of Stormwater Management Systems

7.1.3 State Department of Community Affairs and The Comprehensive Plan

The City has completed its first Comprehensive Plan Amendment. Many of the environmental objectives mirrored or supported the actions of the Indian River Lagoon Comprehensive Conservation Management Plan.

Current City Land Development and Subdivision Codes

City stormwater regulations are currently contained in the City Code, Ordinance 1208, June 1999 revisions. Regulations found in this ordinance deal with two major topics: 1) stormwater regulations related to construction and development activities and 2) the City's stormwater utility program. Stormwater regulations include design requirements, maintenance requirements, enforcement authority and penalties for noncompliance.

Current Design Specifications:

- Establish minimum volume requirements for properties according to gross parcel size in acres
- Set percolation and recovery design minimums by direct reference to SJRWMD regulations
- Require that detention capacity ensures post-development runoff peak rates will not exceed pre-development runoff peak rates for a 10-year, 24-hour storm event
- Require all outfalls to be connected to the City system
- Allow exfiltration through the use of porous pavement in lieu of retention/detention storage
- Prohibit final storage location to impound water against roads or structures
- Prohibit alterations to floodways that would adversely impact off-site storage or conveyance capacities
- Require the use of Best Management Practices (BMPs)
- Encourage water reuse and conservation to be maximized for irrigation use
- Prohibit channeling of runoff into a sanitary sewer

Maintenance specifications:

- Require the submittal of an acceptable maintenance plan by the entity that will maintain the facility prior to the issuance of a building permit
- Require that the facility be maintained so that it performs as originally designed

Enforcement provisions:

- Provide that if inspection shows a facility is not being maintained, the responsible party has 30 days to bring the facility into compliance or the city may place a lien on the property
- Provide authority for the issuance of a stop work order when development activities are not done in compliance with City specifications
- Provide authority for the City to issue a written notice requiring that the development activities be brought into compliance within 3 working days

Penalties for non-compliance

- Provide conditions whereas a non-complying property is subject to a civil penalty
- Provide for the stacking of separate offenses for each consecutive day's failure to comply

The portions of the existing code that deal with the home rule authority to implement and operate a stormwater utility are discussed in detail in Task 12 of the contract. In that body of research, it is recommended that if a re-write of City Code Ordinance 1208 occurs, the authorization of the utility be adopted in a utility ordinance and the methodological and rate provisions be adopted by resolution.

The regulations found in Ordinance 1208 fail to address several stormwater policies that have been established through general practice of the City. In addition, regulations that support the anticipated context of the Phase 2 NPDES Permit are not referenced in the existing Ordinance. Both areas of concern will be addressed in Section 2 of this document.

7.2 - ADEQUACY OF AUTHORITY TO REGULATE

Functional: The Three Basic Elements of Regulation

Themes in stormwater regulation are generally centered around three basic technical elements: 1) a "pre-post" rule, 2) identification of "design storms" and 3) design rules. The City's existing regulations include all three basic technical elements.

"The Pre-Post Rule"

Some form of a "pre/post rule" forms the heart of most regulatory approaches to controlling runoff from land development. The pre/post rule is typically regarded as the "cornerstone" of a good regulatory structure. The pre/post rule describes the extent to which developed property may generate runoff from the property *after* development occurs relative to *before* development. The center post of the pre/post rule is a designated "storm event". Storm events are typically defined in terms of frequency of occurrence as measured over a specified period of time. For example the 10%/24 hour storm event is the storm event, as measured in inches of rainfall for a 24 hour period, that can be expected to occur only once every 10 years (this is also referred to as the "ten-year storm"). The 1%/72 hour storm is the amount of rain that can be expected to fall (measured in inches) in 72 hours from a storm that can be expected to occur only once in every 100 years (also referred to as the "one hundred-year storm").

A typical pre/post rule might state:

"The peak rate of runoff from an area after development shall not exceed the peak rate of runoff from the same area before development for all storms up to a 4%/ 24 hour frequency event."

While the rule is typically imposed on the peak rate of runoff, it is important to note that it can be applied to any or all of the major "attributes" of runoff, including rate, volume, quality, routing and hydro-period (routing refers to how and where stormwater flows over a parcel, while hydro-period refers to how long the soil mantle is wet as it moves across the parcel. Managing the latter is particularly important in wetland areas). Several of the state's water management districts have begun to expand their own pre-post rules to require attenuation on site of volume as well as rate. This change is significant. Increases in impervious surface due to development decreases percolation of rainfall into the soil mantle; this, in turn, increases the volume of runoff discharged from a site as well as the rate at which it leaves a site. Requiring the attenuation of only the rate of discharge from a developing site still allows for the passing of increased volumes downstream from development. (The increased volume is passed off the property at the same rate as before development, but it passes for a substantially longer period of time.)

Stormwater *volume* and stormwater *quality* are closely related. Mere presence of more stormwater volume almost always means more aggregate pollutant load carried into receiving bodies. Meeting the water quality targets of the federal Clean Water Act in terms of Total Maximum Daily Loads (TMDLs) and the State's SWIM Act and its Pollution Load Reduction Goals (PLRGs) requires far more than merely attenuating the rate of discharge. The greater the range of parameters to which the pre-post rule pertains (volume, quality, routing and hydro-period, in addition to peak rate), the smaller the water management burden on the community.

A major aspect of attenuating the *quality* of stormwater runoff is the concept of "first flush". Just as the name implies, first flush is the initial volume of runoff triggered as a storm begins that sweeps up contaminants deposited since the last storm and carries the contaminants to a receiving body. Research indicates that the first half-inch of runoff carries from 50% to 80% of the pollutant load generated from a storm event. Containment (retention) of at least the first one-half inch of runoff is crucial to a cost effective water quality treatment program.

Design Storms and Design Rules

The transition of responsibility from the private to the public sector is typically determined by defining a "*design storm event*" and establishing "*design rules*". The design storm event is that rainfall amount over a prescribed amount of time that a designed stormwater facility must handle in terms of specified parameters (for example, rate, volume, quality, routing and/or hydro-period). A design rule is a requirement that stipulates a minimum level of performance that a facility (storm sewer, road, pad elevation) must be designed to meet. For example, residential roads may be required to be built such that the crown of the road is not overtopped by any standing water up to the 10%/24 hour storm event; a collector road may not be overtopped up to the 4%/24 hour storm.

Public Versus Private Responsibility

At what point, more fundamentally, at what size of storm event, does the community accept the responsibility for the collection, conveyance and treatment of runoff, rather than the builder/owner? That is, where does the community draw the line to define what is the land developer's responsibility for building and maintaining stormwater systems and what is the community's? Stated another way, "Who should pay for the cost of building and maintaining the stormwater infrastructure needed as a result of land development? Should the developer, property owner, tenant or the community pay?"

Whether the design storm for a given regulatory requirement is set at the 2%/72 hour storm or the 50%/24 hour storm is ultimately a strategic level policy question. However, simply stated, the greater the storm event that is required to be handled on site by the property owner under the pre-post rule, or the greater the protection called for under a design rule, the smaller the burden on the community.

7.2.1. Functional: Soil/Water Retention Capability Differences

The regulatory requirements named above should be evaluated with respect to the differing retention capabilities within the Cocoa Beach. The eastern side of the City is characterized as the "dune line" with sandy soils and a low water table. West of the dune line, on the western side of the City are mucky, organic soils, a high water table and lagoon characteristics. City specifications and construction practices could be developed that are specific to the two geographic areas. It is recommended that a design manual, if implemented, address these geographic areas with specific design criteria.

7.2.2. Benchmarking a "Best Practice" Regulatory Structure

A review of a broad range of stormwater regulations from around the state and the country lead us to conclude that stormwater regulation "benchmark best-practices" at this time are made up of the following six sets of practices:

- A pre-post development rule encompassing stormwater volume, routing and quality parameters in addition to peak rate;
- A pre-post development rule encompassing stormwater volume, routing and requirements to retain, and in certain cases, treat, the "first flush";
- Development-based structural design standards anchored around higher-order design storms;
- Erosion control rules addressing both open ground surface and stream-bed conditions;
- An orientation toward vegetative and non-structural or low-impact structural solutions and away from "concrete and pipe" intensive solutions; and
- Non-structural regulations addressing complimentary residential and business practices, such as proper removal of debris and chemicals and the preservation of vegetative buffers and pervious cover.

Currently, best-practice trends focus on the *structure* of regulations. Two such trends include: 1) the integration of all "environment" oriented regulations into a single, all-encompassing body of regulations, such as the structure found in the City of Tallahassee's Growth Management Department, where all environmental-oriented regulations, including stormwater regulations, are found in a single document; and 2) the incorporation of a separate, but complimentary stormwater design manual that is adopted into the regulatory

documents, as exemplified by the practices found in both Hillsborough County and the City of Orlando.

Regardless of the structure used, it is recommended that the ordinance should define the performance levels to be met and the design criteria should describe (or the design manual should illustrate) the manner in which the required performance criteria is to be met.

7.2.3. Stormwater Ordinance Recommendations

It is recommended that ordinances be adopted, that, when strictly enforced, will provide an outcome that meets or exceeds the water quality and stormwater management goals of the City of Cocoa Beach. This would include a reduction in the potential for serious flooding, a reduction in water quality degradation, a reduction in loss of wildlife habitat, the restoration of habitat, sufficient construction controls and scheduled infrastructure maintenance.

7.2.4. Structural BMPs by Ordinance

Ordinances Pertaining to New Development

Ordinances should require Best Management Practices with volumetric design criteria for pre-development release volumes in critical periods, encourage wet detention and specify the treatment and detention of runoff from specific rain events.

Ordinances Pertaining to Existing Development

The modification of existing ponds to achieve new development criteria should be encouraged to the maximum extent practicable.

Roadway Improvements

Ordinances dealing with roadway design should focus on the prevention of the blocking and interruption of drainage function and design requirements should be flexible to allow for varying street widths, pavement types and vegetated swale design to increase water quality treatment and/or runoff collection and conveyance efficiency.

Parking Lots and Roadway Design

Ordinances dealing with parking and access roads should provide incentives for the use of less pervious surface and the reduction of parking spaces. They should require a certain percentage of parking spaces to be pervious and require a certain percentage of the area to be set aside for native vegetation. The use of swales, instead of pipes for collection of runoff should be required wherever possible.

Basin-Specific Criteria

Critical environmental areas should be so designated and receive special, more stringent design criteria for quality and quantity components. Protection zones should be designated and acquired, whenever possible through outright purchase or property trades; should have limited impervious surface cover and stricter buffer and set-back requirements and greater tree cover requirements.

Maintenance Access to Drainage Facilities

Easement acquisition in existing developments should become a priority. Dedication for public purpose of easements in new developments should be included by ordinance.

Complimentary Sanitary Sewer Ordinances to Reduce Pollution

Enforcement of stricter sanitary sewer design standards and the scheduled replacement of existing septic tanks and drain fields should be a priority. Restrict any new sewer lines from crossing water bodies and require redevelopment to adhere to stricter design standards for sewer line repair.

Animal Controls to Reduce Pollution

Requirement of dog leashing, the responsible collection of animal wastes "poop and scoop" rules, and limited access by domestic and farm animals to water bodies should be regulated by ordinance.

Fertilizer and Pesticide Use

Ordinances should restrict the type of chemical treatments to be allowed, should restrict the use of chemical treatments in "environmentally sensitive" areas.

Buffer Criteria for Canals and Other Water Bodies

It is recommended that buffers of natural vegetation and/or drainage swales be required between canals and new development. Additional buffer width should be required in areas that are zoned "environmentally sensitive". Specific design criteria should specify maintenance criteria in canal buffers.

Construction Sites

Ordinances should require the phase construction on sites greater than a specific size and limit land disturbance and site clearing. They should require immediate stabilization of disturbed areas and require more effective controls, such as the use of polymers to prevent erosion during construction. Inspections should be provided on a frequent basis, such as bi-weekly. Erosion and sediment control plans should be submitted by a design engineer prior to the granting of a permit for clearing or other site disturbance activities. Certification of design engineer and contractors for proper erosion control at construction sites should be required in the Ordinance.

7.2.5. Non-Structural BMPs by Ordinance

The public should be educated on the following areas:

- Property use, application, mixing and disposal of fertilizers, pesticides and other chemical applications (pool supplies).
- Recommended use of effective substitutes for fertilizer and pesticide treatments
- Existing ordinances, such as pertains to dumpsters
- Canal buffers, access and restoration
- BMP maintenance programs
- "rain gardens" and vegetated areas
- Xeriscaping
- BMP ownership and stormwater facility transfer
- Evacuation routes
- Septic tank pump-out procedures, if applicable

- Animal Controls
- Proper use of erosion and sediment control materials and practices

7.2.6. Chapter 28, City of Cocoa Beach City Ordinance

The existing ordinance provides the following:

- Standard definitions
- Permitting procedures
- Permitting prohibitions
- Defines land development/disturbance activities that require a permit
- Defines land development/disturbance activities that are exempt from permitting
- Establishes stormwater management minimum requirements
- Establishes contents of stormwater management plan
- Establishes the requirement for a maintenance plan
- Establishes a permit requirement
- Provides for a permit fee
- Describes the building official review
- Provides for appeal of decision by building official or planning board
- Provides for enforcement procedures
- Provides for penalties for non-compliance

Recommended revisions to the existing Stormwater Management Ordinance, include adding definitions for the following terms:

- Aquatic Ecosystem
- Closed Basin
- Critical Duration Storm
- Detention
- Developed Area
- Directly Connected Impervious Area
- Drainage Area
- First Flush Runoff
- Flood or Flooding
- Floodway
- Impervious Surface
- Mitigate
- NGVD
- Off-site
- One-Hundred-Year-Floodplain
- Outfall
- Redevelopment
- Regulated Closed Basin
- Surface Water
- Swale
- Twenty-Five-year Floodplain
- Watershed
- Wet Detention

Revise the following terms:

- "Stormwater management system shall mean the designed features of the property which collect, convey, channel, hold, inhabit, treat or divert the movement of stormwater to insure the proper treatment and storage of these waters"; and
- "Structure shall mean anything constructed or erected which requires a permanent location on the ground or attachment to something having a permanent location on the ground, including movable buildings, either temporary or permanent. "Structure" also includes roads, walkways, paths, swimming pools, tennis courts, sheds and other accessory structures".

The ordinance establishes standards in the form of a series of specific rules and provides for regulatory controls, including penalties, remedies and appeals for non-compliance of the code.

7.2.7. The Stormwater Design Manual

A comprehensive design manual typically introduces the stormwater control policies and provides engineering tools for their development. Performance, rather than the strict adherence to a standard set of design specifications, is the recommended goal of both design engineer and reviewing authority. Since the controlled, mitigated release of storm runoff into the drainage system can be accomplished in as many ways as physical variables exist, the use of a design manual provides maximum flexibility to the innovative designer and increases the probability for successful stormwater control. The design manual does not include penalties for non-compliance.

- Illustrates design standards and requirements for stormwater facilities such as curbs, inlets, outfalls, storm sewers, culverts, swales, ditches, channels, retention and detention ponds, ex-filtration systems and so forth;
- Describes acceptable methods and techniques and sets standard procedures for calculating flows and volumes, and for executing engineering calculations related to sizing facilities;
- Presents baseline data such as historic rainfall graphs for use in all calculations; and
- Defines how drawings and calculations are to be formatted and presented to the jurisdiction in both hard copy and digital form; and
- These attributes of a best practice regulatory structure serve as a checklist against which to compare the City's current regulatory structure.

7.2.8. Special Areas of Local Concern

Disposal of Chlorinated Water From Swimming Pools and Hot Tubs

Water from hot tubs and swimming pools often contains high levels of chlorine. The discharge of this water into canals is harmful to fish and other aquatic life. To minimize the impact of chlorinated water runoff, regulations should include Best Management Practices (BMPS) that will mitigate those impacts. These regulations should include:

- Discharge from pools and hot tubs into the sanitary sewer and the sewage treatment plant. Discharge into storm sewers or surface waters should be prohibited;
- Disposal of pool or hot tub water must include the discontinuation of chlorinating prior to disposal of water;
- Storage of water for at least one week to reduce the chlorine level when water is to be discharged as irrigation
- Storage of water for at least two weeks to reduce the chlorine level when water is to be discharged to the sanitary sewer system;
- Prohibition of water having any detectable level of chlorine;
- Prohibition of discharge so that water flows over someone else's property;
- Prohibition of discharge that causes ponding for periods over 24 hours;
- Prohibition of the discharge of water in a manner that will cause nuisance conditions (such as creation of odors, and fly and mosquito breeding conditions);
- Prohibition of back flushing pool filters into a stream, canal, ditch or storm sewer. Back flush from pool filters must be discharged to a sanitary sewer, on-site septic tank and drain field system, if property designed and adequately sized, or a seepage pit.

Construction Activities

The disturbance of the natural topography and vegetation is principally caused by development activities. Water quality regulations for construction activities can be addressed through ordinances or design manuals. Establishing consistent criteria for BMPs that offer the maximum extent practicable level of water quality control can be provided in a design manual. This should include the most practical and cost-effective construction management control practices for the City of Cocoa Beach. The recommended practices found in the construction BMP Manual would be tailored to the type of conditions experienced in Cocoa Beach. The controls would be characterized by their effectiveness, applicability and cost in order to define a performance-based standard for each control measure.

To establish consistent citywide or basin-wide performance expectations, a site-rating factor might be adopted as a policy decision, establishing an erosion and sediment control plan design goal or "performance" standard for the City of Cocoa Beach. The engineer determines the expected erosion and sediment from a site if no controls were implemented during construction by employing the Universal Soil Loss Equation. Then the engineer must design the control program using the BMP Manual to assure that, as an example, at least 70% of the soil is retained on site. In many cases, this could actually result in less erosion than before construction began.

The Construction BMP Manual might include detailed construction drawings of structural controls meeting the intent and minimum requirements in Cocoa Beach's stormwater quality permitting program for construction activities. In conjunction with the development of Construction BMP Manual, all regulations related to erosion, sedimentation and water pollution prevention and control might address stormwater quality activities associated with development construction. Contents and organization of the manual might include:

- Administrative policies and procedures;

- Design methodology, including performance based criteria for recommended control devices;
- BMP fact sheets with design-related information on recommended control practices, such as the purpose, specific application, design parameters, limitations, and inspection and maintenance requirement of each control practice;
- An outline of recommended procedures for developing a stormwater pollution prevention plans for different types of construction project;

Construction specifications and details for each BMP to be included in the documents; and, at the approval of the NPDES permit, a copy of the federal NPDES requirements for construction activities, including the necessary permit forms, and a brief overview of these regulations.

Increasing the effectiveness of the Construction BMP Manual might include the development and implementation of a training program for the use of the manual and for a basic understanding of construction erosion and sediment control.

Illicit Connections

It is likely that future Part 1 NPDES permit rules in Cocoa Beach will require an initial field screening of storm drainage systems during dry weather to detect illicit connections to storm sewers. To facilitate the illicit discharge monitoring that will be required of the City, regulations should now be developed to place the monitoring burden on those who are causing the problem. Using municipal storm drain maps showing all storm sewer outfalls, future field screening locations should be identified. The collection of grab samples by permittees might be required, or funded by permittees at sites where new construction activity is permitted. If samples are to be captured by City staff, the cost of sampling might be born by those property owners where illicit connections are found. Regulations should also include the prohibition of illegal dumping and similar activities.

A scoring system should be developed to assign a numeric value to each outfall sample site, with the detection of a given parameter resulting in both unit and aggregated scores from multiple visits. Each site should be assigned a rating based on the likelihood of illicit connections, with a corresponding color in the Regional GIS. These color-coded thematic maps are developed during Part 1 of the NPDES application. Regulations should prohibit the discharge of detergents, surfactants, and other pollutants that are most found in outfall samples and the abandonment and removal of all illicit connections. The establishment of used oil collection facilities is an effective program to accompany the removal of illicit connections and illicit discharges.

7.2.9. Residential and Commercial Runoff

Wet-weather monitoring will be a likely outcome of the part 2 NPDES application process. Initially, the number of storm events must be chosen that are sufficient to adequately characterize storm water quality at a given site. It is necessary to choose a sampling that provides a firm statistical base to evaluate stormwater quality and provide the opportunity to improve the number of samples on a seasonal basis. The number of site events should compare to that USEPA would have required if each city had established individual wet-weather monitoring programs. The wet-weather monitoring program should

be sufficient to characterize typical runoff from three broad land use classification – residential, commercial and industrial. Highway sites might also be sampled.

7.2.10. Coastal and Shoreline Protection

The City of Cocoa Beach's ocean shoreline is located within an area that has been identified as a critical erosion area in Florida. This is documented in the Critical Erosion Report, January 2000, furnished by FDEP's Office of Beaches and Coastal Systems. This critical erosion segment stretches from Cape Canaveral south to the City of Melbourne. In this area, coastal cities have additional erosion and pollution problems and responsibilities. These responsibilities include:

- Establishment of shoreline, inlet and monitoring guidelines and methodologies;
- Organization, inventory and exchange of shoreline change information;
- Assessment of dune erosion, beach erosion and wave transformation'
- Model inlet and coastal processes;
- Development of coastal impact assessment guidelines and criteria for assisting in the process of permit reviews funding requests, and rule policy development;
- Integration of monitoring data and analytical tools with PC based GIS software;
- Performing of special engineering inspections and generation of reports following hurricanes, tropical storms and other of the City's emergency response activities.
- To support the responsibilities of Cocoa Beach, it is recommended that regulations would include:
 - Coastal vegetation and landscaping guidelines;
 - Seawall construction, demolition and maintenance;
 - Design requirements based on storm surge modeling;
 - Trimming and removal of natural vegetation and animal habitat;
 - The choice and construction of sand fences, design and construction of beach/dune walkover structures;
 - Permitting and inspection of dune restoration projects; and
 - Signage that is educational in nature in conjunction with the design of public use areas of coastal properties.

The Florida DEP office of Beaches and Coastal Systems supports coastal engineering, permitting and beach management through monitoring, modeling and analysis of Florida's coastal systems. Florida DEP publications are an excellent resource for information on a wide variety of topics related to beaches and coastal systems. These documents are available on the FDEP website. Website information is included in the Appendix.

7.2.11. A Checklist of Specific Municipal Regulations

With the submittal of the Phase 2 NPDES Permit, it is recommended that City regulations specifically prohibit any development activity that causes the City to violate a water quality standard, the city's NPDES permit, or any state-issued discharge permit for discharges from its MS4. Local government has the ultimate responsibility for all discharge within its boundaries. Regulations are recommended to include prohibitions against dumping, spilling, leaking, pumping, pouring, emitting, emptying, discharging, leaching, disposing or otherwise introducing any of the following substances into a water body of the state (or nation) or into an MS4:

Used motor oil, antifreeze, or any other motor vehicle fluid, such as:

- Industrial waste;
- Hazardous waste, including hazardous household waste;
- Domestic sewage or septic tank waste, grease trap waste, or grit trap waste;
- Garbage, rubbish, or yard waste;
- Wastewater from a commercial car wash facility, or from any washing, cleaning or maintenance of any business or commercial or public service vehicle, including a truck, bus, or heavy equipment, by a business or public entity that operates more than 2 vehicles;
- Wastewater from a commercial mobile power washer or from the washing or other cleaning of a building exterior that contains any soap, detergent, degreaser, solvent or any other harmful cleaning substance;
- Wastewater from commercial floor, rug or carpet cleaning;
- Waste water from the wash-down or other cleaning of pavement that contains any harmful quantity of soap, detergent, solvent, degreaser, emulsifier or any other harmful cleaning substance;
- Wastewater from the wash-down or other cleaning of any pavement where any spill, leak, or other release of oil motor fuel, or other petroleum or hazardous substance has occurred, unless all harmful quantities of such released material have been previously removed;
- Effluent from a cooling tower, condenser, compressor, emissions scrubber, emissions filter, or boiler;
- Ready-mixed concrete, mortar, ceramic, or asphalt base material or hydro-mulch material, or material from the cleaning of commercial vehicles or equipment containing, or used in transporting or applying, such material;
- Runoff or wash-down from any animal pen, or kennel containment area;
- Back-wash from a swimming pool, fountain, or spa;
- Swimming pool water, containing harmful quantities of chlorine, muriatic acid or other chemicals used in the treatment or disinfection of the swimming pool water or in pool cleaning;
- Discharge from water lines that following super-chlorination or any other chemical used to disinfect water lines;
- Water from a water curtain in a spray room used for painting vehicles or equipment;
- Substance or material that will damage, block or clog the MS4;
- Discharge into the MS4 or a water body of a harmful quantity of sediment, silt, earth, soil, or other material associated with clearing, grading, excavation or other construction activities, or other placement or disposal of soil, rock, or other earth material, in excess of what could be retained on site or captured by employing sediment and erosion control measures to the maximum extent practicable (under prevailing circumstances);
- Connection of a line conveying sanitary sewage, domestic or industrial, to the MS4 or allow such a connection to continue;
- Water from a service station to be discharged into the MS4, unless wash-water has passed through a functioning grease, oil and sand interceptor before discharge
- Discharge used oil into the MS4 or a sewer, drainage system, septic tank, surface water, groundwater or water course;

- Mix or commingle used oil with solid waste that is to be disposed of in a landfill;
- Apply used oil to a road or land for dust suppression, weed abatement or other similar use that introduces used oil into the environmental.

It is recommended that any re-write of existing regulations and ordinances include or retain "nuisance" provisions that require:

- Proper trash and debris removal from property;
- Prohibit the allowance of standing stagnant water;
- Prohibit storage of toxic or hazardous substances on property so as to allow exposure to precipitation and stormwater runoff; and
- Protection of special local features critical to control stormwater runoff, such as wetlands, swales, and ponds.

Exemptions and Loopholes

The following are noted:

- The "Building Official" is given a great deal of discretion and guidelines or conditions are not included for exemption of specific regulations;
- Regulations dealing with "agricultural land" are irrelevant and are recommended for removal in a regulatory re-write;
- Definition of "redevelopment" is vague;
- Parcel size requirements and thresholds are not applicable to properties within the City of Cocoa Beach;
- Reference to "Industrial" land uses is not applicable. "Light Industrial" might be more applicable for businesses such as body shops;
- Duplication in rules, regulations should be eliminated;
- A protocol or standard operating procedure for enforcement of non-compliance should be included.

7.3. ADEQUACY OF COMPLIANCE PROCEDURES

The key to successful compliance is three-fold. First, the public must be aware of the City's stormwater management program and long-range goals. Public recognition of environmentally friendly land practices is recommended. Second, the City must assume both a leadership and an enforcement role to establish the importance of compliance with rules and regulations. Construction and maintenance activities that are undertaken by either City forces or sub-contractors should set an example for private development activities. Third, the rules and development regulations must be authorized, monitored, inspected and enforced in a consistent and thorough manner. To facilitate compliance, it is recommended that the City Commission designate an individual as the Stormwater Compliance Officer. This individual (and his designee or assigns) would have the responsibility for inspection of all stormwater-related facilities, the placement and functioning of BMPs and would be authorized to enforce all stormwater management rules and regulations.

Recommended Compliance Monitoring

Compliance monitoring should include the right of entry for the purpose of inspection and sampling. The Compliance Officer (or his representative or assign) shall have the right to enter any site or premise discharging stormwater water to the municipal separate stormwater system (or to waters of the United States) to determine if the discharge permitted is complying with all requirements of the City's ordinance. Discharge permittees should make available (to the City) any self-inspection reports, monitoring records, compliance evaluations and all other records that are related to compliance with any state or federal discharge permit. Other recommended compliance monitoring authority might include the:

- Right to permitted entry without delay, regardless of security measures in place;
- Right to require installation of sampling/metering devices
- Right to require any discharge permittee to conduct specified sampling, testing, analysis or other monitoring of stormwater discharges, and the ability to set the frequency and parameters of such monitoring;
- Right to require installation of monitoring equipment at the discharge permittee's expense. Sampling and monitoring equipment to be maintained in a safe and proper operating condition by the discharge permittee at his own expense;
- Right to calibrate all devices used to measure stormwater flow and quality to ensure accuracy; and
- Right to order removal of any temporary or permanent obstruction to safe and easy access to the facility to be inspected, at the expense of the discharge permittee.

It is recommended that the refusal of discharge permittee to comply with compliance monitoring "rights" would lead to the issuance of a search warrant from any court of competent jurisdiction.

7.4. ADEQUACY OF ENFORCEMENT RESOURCES

Staffing

The designation of a Stormwater Compliance Officer must be accompanied by the appropriation of sufficient resources to fund this position and its associated record-keeping responsibilities. Historically, the Enforcement Services (Code Enforcement) and Public Works (Inspector) have had shared responsibilities but no clear authority on enforcement policies. It is recommended that the Stormwater Compliance Officer's responsibilities include, but not be limited to the inspection of:

- Private development erosion and sediment control;
- BMPS;
- Public utility road cuts;
- Stormwater monitoring projects;
- Sand fence and beach walkway construction;
- Site clearing and grading;
- Private and public mitigation facilities; and

Public roadway improvements having a stormwater component.

Knowledge and Expertise

It is recommended that the Stormwater Compliance Officer should:

- Have local drainage facilities knowledge;
- Be familiar with accepted engineering practices;
- Possess understanding of the design, purpose, maintenance and use of best management practices;
- Have understanding of applicable City, State and St. Johns River Water Management District rules and regulations; and
- Seek to be informed of new and innovative solutions to stormwater pollution and flooding problems.

Compliance Enforcement Authority

The Stormwater Compliance Officer should be authorized to issue the following administrative enforcement remedies:

- Warning Notice
- Notification of Violation
- Consent Orders
- Notice of Show Cause Hearing
- Compliance Orders
- Remediation, Abatement and Restoration Orders
- Emergency Cease and Desist Orders
- "Red Tags"

7.4.1. Public Information Program

The success of any compliance program can be measured by the public acceptance of its adoption. It is recommended that the compliance activities be addressed in future public information brochures and that all City staff be made aware of changes in stormwater rules, regulations and public policy. Interaction between the public and the Stormwater Compliance Officer should be encouraged.

Other Administrative Procedures and Judicial Enforcement Remedies

A successful compliance procedure must include certain rights and remedies by resolution or ordinance. Recommended for inclusion are:

- Right to Reconsideration and Hearing
- Right to Appeal
- Imposition of Civil Remedies
- Imposition of Criminal Penalties
- Availability of Civil Suit under Florida Law

Remedies for non-compliance are not exclusive of any other remedies that the City may have under state or federal law or other city ordinances. The City may take any or all actions against a violator. The City is empowered to take more than one enforcement action against any violator. These actions may be taken concurrently.

7.5 CONCLUSION

In general, review has found that the City's current regulatory structure rests on a solid foundation. However, as the focus of stormwater management in general expands to more robustly embrace quality related issues and compliance with the City's NPDES Phase 2 permit; the City should adjust its regulation accordingly. Our recommendations include the following enhancements to existing regulations:

- *Expansion of the pre-post rule to consider the stormwater characteristics present in the two distinct geographic areas found in the City. Adjust the requirements for quality, volume, routing and peak rate based on their individual soil and stormwater characteristics.*
- *Adoption of a more expansive prohibition of illicit discharges into the City's stormwater system to support the future NPDES permit conditions.*
- *Designation of a Stormwater Compliance Officer from an existing or new staff position.*
- *Development and adoption of a Stormwater Design Manual, including design drawings and specific criteria according to site conditions, such as, but not limited to, the geographic location, soil condition or elevation of the property.*

The adoption of these recommendations will assure consistency throughout the development community in the deployment of stormwater facilities and will add reassurance that the facilities will actually meet design standards. An illustrative listing of the contents of such a manual is attached as Attachment B.

