

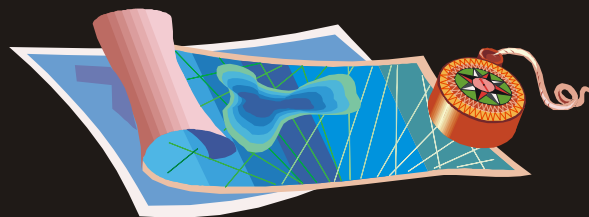
DRAINAGE

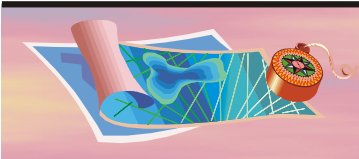
DRAINAGE ELEMENT

- Introduction
- Issues and Concerns
- Goals, Objectives and Policies
- Exhibits



VISION 2020





Vision 2020 Comprehensive Plan Seminole County, Florida

DRAINAGE ELEMENT INTRODUCTION

The Drainage Element has been prepared to assess current and anticipated needs associated with stormwater management, to define the County philosophy and policy direction with regards to addressing these issues and to outline a long range implementation plan to solve the identified problems. The focus of the County's Stormwater Program concerns both the quantity aspects of drainage relating to capacity and flood control and also the quality of runoff into receiving waters.

The County's major stormwater conveyance system is comprised largely of a system of private, inadequately maintained agricultural ditches and canals connected to natural streams, which feed into the major lakes and rivers. This conveyance system, while once adequate to serve a predominantly agricultural community, is insufficient to meet the needs of the County and has been for several years. Standards have been established for correction of deficiencies and are intended to ensure that improvements are made to key structures within all basins on an interim basis followed by correction of deficiencies in a comprehensive fashion. Eleven master basin evaluations of the sixteen identified basins have been completed or are in process and there are a number of additional deficiencies that have been identified with these studies.

An additional issue of increasing concern is the water quality impacts of storm runoff to receiving water bodies. Currently, Seminole County is monitoring over fifty-five locations along many natural water bodies; however, this is considered an insufficient number of sampling sites by agency standards. The current status of the lakes and rivers with regards to water quality has been assessed and several programs are being implemented improving water quality. Further, regulations promulgated by the U.S. Environmental Protection Agency (USEPA) known as the National Pollutant Discharge Elimination System (NPDES) have had significant impacts on the County's level of monitoring outfalls to waters of the State. Additionally, the Florida Department of Environmental Protection (FDEP) is working with Seminole County to plan for the implementation of Total Maximum Daily Loads (TMDLs) on many of the County's receiving water bodies.

County stormwater standards contained within the Land Development Code are anticipated to adequately control the impact of new growth; however, the cost of existing deficiencies (approximately Fifty-five million dollars) has increased by a factor of seven since the original Comprehensive Plan. As a result of the drainage basin evaluations, a five-year program strategy has been established to systematically identify and improve existing deficiencies. While the magnitude of long-range stormwater needs cannot be accomplished within the identified five-year planning horizon of the Capital Improvements Element, the program represents a means to begin addressing these needs. The ability to fund ongoing stormwater needs is key to accomplishing the identified program. Historic and current revenue sources for stormwater are insufficient to meet the magnitude of long range requirements..

Lastly, one of the most significant new projects completed by the County's Stormwater Division has been the development of a Countywide Watershed Atlas, a website that has the potential to serve as the public clearinghouse for stormwater, water resources, and other natural resources data regarding Seminole County. This tool contains bathymetric (contour) data, vegetation data, wildlife data, and water quality data on all of the water bodies in Seminole County, providing staff, citizens, and professionals with up to date information online.



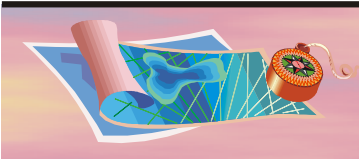
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Primary sources of information used to produce this element are from or include the following:

- A Seminole County Public Works
- B Seminole County Development Review Division
- C Seminole County Road Operations and Stormwater Division
- D Seminole County Drainage Inventory and Engineering Evaluations





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DRAINAGE ELEMENT ISSUES AND CONCERNS

Issue DRG 1

Basin Evaluation/Improvements

To meet the requirements of the Florida Growth Management Act Ch. 163.F.S., and to ensure the public safety and protection of property, an analysis of the County's existing stormwater system and a systematic program to correct existing deficiencies and meet future demands is necessary, and has been ongoing since the late 1980's.

In order to assess the magnitude of existing drainage deficiencies, Seminole County undertook a planning study of stormwater needs, entitled the Stormwater Management Study. This study was based on available information and an assessment of the County's major conveyance system. The primary finding of this study indicated that a significant portion of the existing drainage infrastructure is in need of improvement. *Policy DRG 1.6: Strategy for Deficiency Correction/Study Implementation* identifies the chronological process for completing identification of deficiencies and correction, beginning with the drainage basin evaluations, or basin inventory and engineering studies. The completion of eleven of sixteen needed drainage basin evaluations has more accurately defined deficiencies and dollars needed to evaluate potential upstream and downstream impacts of proposed solutions. The primary result of the Stormwater Management Study was the prioritization of master basin evaluations necessary to accurately determine existing deficiencies and future needs.

The eleven master basin evaluations that have been completed for Seminole County includes (all of the basins identified for study are depicted on *Exhibit DRG: Drainage Basins*):

- A Gee Creek
- B Little Lake Howell
- C Howell Creek
- D Lake Jesup
- E Little Econ River
- F Little Wekiva River
- G Midway
- H Lake Monroe
- I Soldier's Creek
- J Sanford (completed by the City of Sanford)
- K Wekiva

The original evaluations have identified the ten and twenty-five year storm frequencies and used twenty-four hour rainfall events under existing hydrologic conditions to determine deficiencies. Since 1996, all basin evaluations have included analysis of the mean annual (2.3 year), ten year, twenty-five year, fifty year, and one-hundred year storm events. There are five remaining basin evaluations to be completed. Funds are currently committed within the Capital Improvements Element to continue basin evaluations and improvements. The Capital Improvements Element contains a prioritized schedule of the County's remaining



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basin evaluations and continued improvements to meet the requirements of the Florida Growth Management Act, Ch. 163.F.S., and to ensure the public safety and protection of property.

Issue DRG 2

Funding

Funding continues to be one of the most important issues of the County's current Stormwater Management Program. The cost of correcting unfunded deficiencies has grown steadily in recent years. The dollar increase is due both to the identification of needs from the master basin evaluations and the few projects that have been funded since that time.

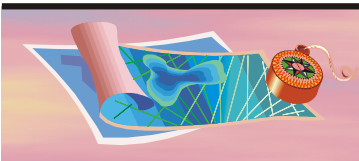
An effective Stormwater Program will ensure public safety, minimize flooding, ensure sufficient treatment of runoff and meet or exceed regulatory requirements, which is especially true given the implementation of FDEP's TMDL program. This will require the continued implementation of the specific master basin plans, correction of existing deficiencies and ongoing system maintenance. The acquisition of right-of-way is an essential component to the long-range maintenance of stormwater facilities. The magnitude of costs associated with meeting these needs is beyond the means of the County's currently applied revenue sources.

A final component, which is critical to effective stormwater management in the new millennium, is maintaining an effective water quality program. Higher standards are required today for maintaining the water quality of receiving water bodies from the state and federal government than in 1991. Currently, the County has a limited water quality monitoring program that is maintained through the NPDES requirements, but the County will be working with the FDEP towards expanding future monitoring efforts as part of the TMDL program.

Upon completion of the five remaining basin evaluations, the number and cost of identified deficiencies will likely increase. Historical funding sources allocated for stormwater evaluations and deficiency correction have not addressed comprehensive stormwater program needs.

Seminole County shall continue to pursue development of funding strategies, which generates the required funds while being equitable to County residents. As recommended within the Stormwater Management Study, Seminole County has in the past and is continuing to evaluate funding mechanisms to alleviate these deficiencies, such as the possibility of a stormwater utility fee. Other financing alternatives recommended by the Stormwater Study to be used in conjunction with the utility included bonding, and special improvement assessment districts. These alternatives and others may be considered by Seminole County for funding of specific drainage improvement needs to supplement a stormwater utility or similar programs.





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Issue DRG 3

Operation and Maintenance

Historically, Seminole County's maintenance of stormwater facilities has focused primarily on improvements associated with the development, expansion and maintenance of County roadways. With the correction of deficiencies and establishment of standards based upon a facilities performance, an ongoing maintenance program was developed to ensure that facility standards are maintained. Given the current growth rate and the continuing natural deterioration of existing drainage systems, ongoing maintenance and structural improvements are issues of increasing importance. Seminole County should consider increasing current stormwater facility maintenance practices and upgrade its maintenance program.

Privately owned systems are a major issue that will continue into the future. A number of primary stormwater conveyance systems are under private ownership, thus prohibiting county maintenance. A number of these private systems, developed primarily for agricultural purposes, were not upgraded with associated roadway developments. The County has initiated a program to acquire and/or secure legal access to drainage rights of way since improvements and maintenance of these ditches and canals is becoming a critical component to the overall stormwater program. This subject is further discussed in Drainage Issue 4.

Another issue that the County plans to address in the future is the use of underdrain facilities. Underdrains are perforated pipe systems placed under or around ponds and roadways to aid in drawdown and recovery of stormwater. They are typically used in areas where natural storage retention systems do not provide sufficient percolation or used where there is insufficient land for retention ponds. Historically, these systems have required an extensive and expensive amount of maintenance to keep them free of debris and organic accumulation. The use and resulting high maintenance requirements of underdrain facilities as an alternative stormwater management device is becoming an increasing issue of concern for Seminole County and other local governments. Regulations requiring local government certification and maintenance of such systems have created a costly burden to local governments and the local community. Inadequate facility maintenance poses serious water quality impacts to local communities. Since the SJRWMD has revised its rules regarding underdrains, they are being used less often. Seminole County currently has plans to review the regulations and discontinue use of underdrains.

Issue DRG 4

Intergovernmental Coordination

Due to the interconnection of surface water flow and the operation of drainage systems, it is cost effective and more efficient to study, fund and implement master plans by basin areas rather than jurisdictional boundaries. Historically Seminole County has paid for the master basin planning of all basins except the Sanford basin. This initiative provides a platform for coordination with numerous local governments and other agencies to collaborate with implementation of the plans. To continue and expand upon this coordination, Seminole County adopted a resolution in 1989 establishing an Intergovernmental Task Force for Stormwater Management. The Task Force membership, now called the Middle Basin Working Group, is comprised of officials representing Orange County, the SJRWMD, and all municipalities and other concerned agencies within Seminole County. The purpose of this Working Group is to partner with the SJRWMD to increase education, funding for projects, and improve water quality of the middle St. Johns River Basin.



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During the spring of 2000, Seminole County went online with a revolutionary new web-based information system known as the Seminole County Watershed Atlas. This new tool contains the County's best available information on water quality, bathymetry, vegetation, and in some cases, wildlife in an easy to use search format for all of Seminole County's natural waterbodies. Additionally, this tool contains a powerful search engine for bibliographic information on waterbodies, including studies, reports, and other information types. Future plans include providing real-time water quality information on select water bodies of Seminole County, NPDES information, and TMDL bioassay results for designated impaired water bodies. It is vital to the future of the educational endeavors of Seminole County Road Operations and Stormwater Division that continued commitment to this tool occurs and be available for others to use.

Issue DRG 5

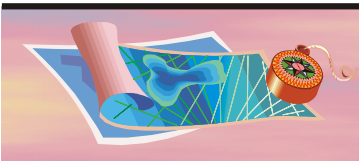
Private Facilities/Retrofitting

Seminole County is responsible for the development and operation of publicly owned stormwater facilities. There are a significant number of private systems that are inadequate and/or not maintained posing the potential for local flooding. Two general categories of private stormwater facilities need attention: (1) improperly maintained and deteriorating structures and (2) older systems, which are inadequate and not consistent with existing, design regulations.

The improvement and ongoing maintenance of existing stormwater facilities is an issue of increasing importance given the age and continuing deterioration of these structures. Maintenance of systems associated with private developments is typically the responsibility of homeowner associations. Where improvements and facility replacement are necessary, Seminole County makes private property owners aware of alternative options for facility correction to include the establishment of Special Assessment Districts which permit the County to correct deficiencies and maintain facilities.

Today, there are many older developments that cannot adequately handle the volume of stormwater runoff generated onsite, and are without provisions for treatment to ensure water quality. Seminole County now regulates the expansion and/or redevelopment of all sites to require that stormwater facilities meet or exceed existing regulations.





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Issue DRG 6

Water Quality

Statewide, there is increasing concern over the contribution of stormwater runoff to the water quality of receiving water bodies. For Seminole County, a designated Primary Water Caution Area (by the SJRWMD), groundwater is of increasing concern and regulation. Additionally, water quality standards for new developments must be addressed to meet the requirements of the Florida Growth Management Act, Ch. 163, F.S. Currently, regulations and standards associated with the construction, design and operation of stormwater management facilities address water quality treatment. Programs for improving existing degraded receiving bodies are of concern. Potential impacts can be divided into two general categories: point and non-point sources of contribution.

The FDEP and the USEPA regulate point source discharges. Seminole County and the SJRWMD currently regulate new non-point source discharges. However, existing non-point sources are not regulated nor are non-point sources, such as agricultural runoff, required to retro-fit to meet current regulations.

A program has been implemented by the County to assess and monitor, on an ongoing basis, water quality in the County's primary drainage ways and receiving bodies to determine critical areas or specific pollution conditions associated with stormwater runoff and to identify a long-range program to correct problems. The Water Quality/NPDES Section currently monitors (or collects surface water samples) on a quarterly basis (four times a year) at approximately fifty-five locations. The Stormwater Division's Water Quality/NPDES Section's primary objectives are monitoring, protecting, and maintaining the quality of surface waters in unincorporated Seminole County. These objectives are achieved through a coordinated sampling program, public education and outreach, County (internal) education and training, volunteer revegetation and clean up projects, water quality improvement projects, and by providing technical assistance to residents and other agencies.

The USEPA required that Seminole County, as well as the seven cities within the County, apply for and receive a National Pollutant Discharge Elimination System Stormwater Permit (NPDES). The overall goal of this permit, as part of the Federal Clean Water Act, is to reduce the amount of pollutants in stormwater runoff that is discharged directly into natural waterbodies, streams and rivers systems. This goal is achieved through the previously mentioned tasks (monitoring, education, improvement projects, etc.). This goal is also achieved through state regulations that were implemented in the 1980's, which require developments to construct stormwater systems that provide water quality treatment for stormwater runoff (such as retention ponds and other similarly functioning structures). The County is required by this NPDES permit to track many of these tasks throughout the year and to summarize them in an Annual Report that is submitted to FDEP (Florida Department of Environmental Protection). These locations include lakes, rivers, creeks and streams. The water quality data from these samples can be seen and explained on the Seminole Watershed Atlas, which can be found at www.seminole.wateratlas.org. In addition to the water chemistry sampling program, the Water Quality staff will begin conducting biological monitoring/habitat assessments annually at five stream and river locations. This type of monitoring is called Stream Conditions Index (SCI) or Rapid Bioassessment. This monitoring will include assessing impacts on in-stream habitats, as well as the surrounding habitats, types of habitats found, and identifying macroinvertebrates (insects and insect larvae) in the stream/river. This type of assessment will give an overall picture of the health of the stream/river. FDEP, who developed this type of assessment, has been training



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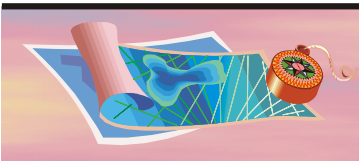
County staff on this assessment methodology. This information, once collected, will also be available on the Seminole Watershed Atlas.

Impaired Surface Waters Rule Development

The "Identification of Impaired Surface Waters" Rule (62-303 FAC) was made available by FDEP on September 5, 2000. This rule defines impairment for lakes, streams, and estuaries based on nutrient enrichment, recreational use, drinking water use and fish/shellfish consumption use. A load allocation Technical Committee (TAC) has developed a report which was submitted to the legislature February 2001 and adopted by the Environmental Regulation Commission in April of 2001. The report made recommendations on how TMDLs should be allocated among stakeholders. At this time, the TAC has recommended a series of three "Control Strategies" for reducing the loads to a waterbody. These strategies are based on the percentages of participation on contribution from agricultural non-point sources and level of retrofits of development that existed prior to stormwater regulations. Levels one and two attempt to reduce loads by assigning loads to a ratio of the percentage of retrofit projects to the percentage of contribution from non-point sources. The third level would allocate equivalent reduction percentages among all discharges and continue to allocate additional set percentage reductions to all sources until the TMDL is met. These allocations and reductions are based upon the calculated total suspended solids, and if this parameter remains above the TMDL after the control measures have been implemented, regional stormwater treatment systems may be needed.

The Federal Clean Water Act (CWA) requires that states must submit lists of surface waters that do not meet applicable water quality standards (impaired waters) and TMDLs for these waters. Essentially, each impaired water body/segment will be allowed to receive a certain annual amount/quantity of pollutant from every source, this includes point sources (industries, wastewater treatment plants, etc.), stormwater runoff, agricultural runoff, and air deposition. The TMDL development for each pollutant of concern for each water body will be determined through the TMDL development cycle. The development and implementation of the TMDLs by FDEP is currently being conducted on a five-phase cycle that rotates through Florida's major basins every five years, and includes initial basin assessment, coordinated monitoring, data analysis and TMDL development, basin management plan development, and implementation. Seminole County recently participated in bioassessment training with the FDEP, and monitoring of the designated impaired waterbodies has begun. The development of the basin management plan will require all affected or involved parties that contribute to pollutant loads associated with a designated waterbody to coordinate with FDEP in this process.





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The following is the currently listed water bodies/water body segments that are on the FDEP TMDL list for Seminole County:

- A Cranes Strand Ditch
- B Econlockhatchee River
- C Lake Harney
- D Lake Jesup
- E Lake Jesup at the St Johns River
- F Lake Monroe
- G Little Econlockhatchee River
- H Little Wekiva River
- I Lockhart Smith Canal
- J Soldiers Creek
- K St. Johns River
- L Wekiva Springs

Issue DRG 7

Level of Service

A level of service is defined by Rule 9J-5 F.A.C. as an indicator of the extent or degree of service provided by, or proposed to be provided by a facility based on and related to the operational characteristics of the facility. The adoption of a level of service for stormwater facilities must ensure that acceptable flood control and water quality is maintained or improved with the issuance of development permits or capital improvements scheduling.

Generally, levels of service are set based upon the “capacity per unit demand of each facility”. However, this concept cannot readily be applied to stormwater conveyance systems. Rather, a “level of protection” is defined based upon the frequency and duration of a rainfall event and the performance of the facility regarding flood control and water quality treatment. For the drainage element, level of service is actually a level of protection. Levels of service have been established for new development. The adopted level of service is consistent with the rules of the FDEP and the SJRWMD. The County has also adopted the same standard criteria for correction of deficiencies.

As Seminole County proposes to implement a long range deficiency correction program for drainage structures, *Policy DGR 5.4: Water Quality Monitoring and Deficiency Correction Program* outlines guidelines for the systematic correction of deficiencies and ongoing facility maintenance. The deficiency correction program focuses on meeting the standards for new development in Seminole County (*Exhibit DGR: Level of Service Standards for New Development*). Additionally, the basin evaluations used to identify deficiencies have developed guidelines used to assign critical duration design storms based on the type of facility being used. Basin evaluations and improvements are made in a priority order as adopted within the Capital Improvements Element until completed and improved to accommodate, at a minimum, a 25 year design storm.

Upon completion of improvements for all basins, the second level of facility improvements shall be made to ensure that a basin can accommodate the design storm identified in each



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individual basin master plan as the optimum level of flood protection. Additionally, standards and criteria for the long-term operation and maintenance of the conveyance system will be developed as necessary to sustain each basin's level of service.

Issue DRG 8

Recharge Protection and Groundwater Supply

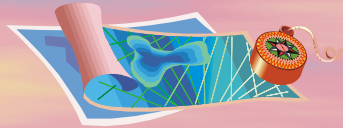
The most effective aquifer recharge areas are often located within areas most suitable to development. Development performance standards and other mechanisms have been implemented to ensure the preservation of the most effective recharge areas.

The Floridan Aquifer is the primary source of potable water for Seminole County. Replenishment of the Aquifer occurs primarily from rainfall on recharge areas. The most effective recharge areas are generally high, dry uplands with highly permeable soils and poor surface drainage. Within Seminole County, most effective recharge areas are located within the southwest part of the County, the I-4 corridor and the Geneva area. These areas are clearly shown in *Exhibit FLU: Recharge Areas*. In order to ensure that functions of most effective recharge areas are maintained, including, but not limited to, the protection of water quality, measures have been implemented to maximize preservation of these areas.

Current measures include the increase of open space areas and protection of native vegetation. This is particularly important within the southwest and west portions of the County, which are highly urbanized, thus leading to a greater amount of impervious surfaces. Other means to be evaluated to supplement County regulations include use of natural retention areas, minimizing lowering of the water table, septic systems and treated effluent used for spray irrigation.

Both the quantity and quality of available potable water supplies is an increasing concern as Seminole County continues at a high rate of growth. Seminole County has conducted a Ground Water Supply Study to assess the availability and quality of potable water supplies. The study includes a Countywide (including portions of Orange County) model of the Floridan Aquifer and evaluated existing and future water demands, critical water supply areas, salt-water intrusion, and future wellfield locations. This report estimated that the County is currently overdrafting more potable water than is being recharged. The study reports that the County will not be able to meet projected water demands without substantial conservation programs. A task force of County, municipal and private water supply agencies was created to assess study results and develop recommended water conservation programs, and recommend further study needs. A wellfield protection ordinance has been adopted to regulate and develop performance standards for uses within protection zones, which may impact groundwater quality.





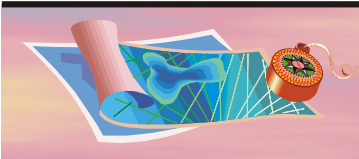
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Since that time, the SJRWMD has completed a lengthy study process of the water supply issues of the entire St. Johns River basin, of which Seminole County is a part. Seminole County has been designated as priority water caution area as a result of this study process, known as Water 2020. This study indicated that the Floridan Aquifer, our primary source of groundwater, is scheduled to significantly decrease in volume during the next planning horizon (20 years) and it identified alternatives for water supply to offset these decreases, most notably, surface water. There are multiple issues related to establishment of a surface water supply system, including siting of facilities, costs, and minimum flows and levels, to name a few. Seminole County recently partnered with the SJRWMD to initiate a feasibility study of surface water opportunities within the middle basin and is currently providing staff representatives on several key advisory groups relative to the entire water supply planning process. Seminole County should maintain an active role in this process and play a major role as a facilitator of interests with the various stakeholders.



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DRAINAGE ELEMENT GOALS, OBJECTIVES AND POLICIES

GOAL

The County will continue to implement a cost effective stormwater program, which minimizes flooding and the adverse impacts of uncontrolled stormwater runoff to the public safety and to the quantity and quality of natural resources.

OBJECTIVE DRG 1 DEFICIENCY CORRECTION

The County will continue to implement a program to systematically identify and correct existing deficiencies and meet future needs. Emphasis should be placed on maximizing use of existing facilities and discouraging urban sprawl.

Policy DRG 1.1 Basin Evaluations

The County shall continue its long-range program strategy, which builds upon existing stormwater studies to direct Stormwater Program needs that shall include, at a minimum, the following activities:

- A The County shall continue to conduct individual drainage basin master plans, which survey and assess systems conditions, identify existing and future system deficiencies and identify necessary improvements to meet both short and long term levels of service.
- B The County shall prioritize remaining basin master studies based on the best available data, ongoing agency studies, identified deficiencies and anticipated growth.

Policy DRG 1.2 Deficiency Correction

The County shall eliminate existing facility deficiencies, when feasible, through a systematic program to upgrade existing structures and/or construct area-wide systems as funding becomes available.

Policy DRG 1.3 Complaint Tracking

The County shall expand and develop the existing drainage complaint tracking system to facilitate the identification of nuisance problems, to assist in locating and prioritizing capital projects, and to establish a data base of historical drainage needs and corrective actions.

Policy DRG 1.4 Right-of-Way Acquisition

The County will continue to secure legal access and/or acquire rights-of-way associated with primary stormwater conveyances in order to correct deficiencies and maintain facilities.

Policy DRG 1.5 Deficiency Correction

The County shall maximize the use of existing facilities through increased capacity, operation and maintenance and consider area-wide stormwater facilities in correcting existing deficiencies and meeting growth needs.



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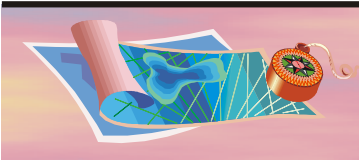
Policy DRG 1.6

Strategy for Deficiency Correction/Study Implementation

The following chronology of events shall be used as a guide to facilitate the completion of basin evaluations, correction of deficiencies and maintenance of facility performance:

- A **BASIN EVALUATIONS:** Basin evaluations shall be completed in priority order based on Policy 1.1 and adopted within the Capital Improvements Element. Basin evaluations shall include the components outlined in Policy 1.1 and contain immediate and long term improvements and identification of the design storm to which long term improvements will be made and maintained for each basin.
- B **DEFICIENCY CORRECTION:** The Capital Improvements Element of the Comprehensive Plan shall be amended as each study is completed to adopt the improvements necessary to accommodate a 25 year design storm, or the following facility based standards:
 - 1 A 100-year/24-hour design storm standard will be assigned to bridges with spans greater than twenty feet and to any modeled stormwater structure intended to keep evacuation routes and emergency service buildings identified by the County operational.
 - 2 A 50-year/24-hour design storm standard will be assigned to all cross drains and bridges with spans less than 20-feet intended to keep operational evacuation routes and emergency services buildings identified by the County operational.
 - 3 A 25-year/24-hour design storm standard (as identified above) will be assigned to the primary drainage system and all retention/detention facilities included in the stormwater model that are not subject to the criteria listed above.
 - 4 A 10-year/24-hour design storm standard will be assigned to all closed pipe conveyance systems and roadside swales included in the stormwater model that are not subject to the criteria listed above.
- C **FACILITY IMPROVEMENT DESIGN:** All structural improvements to the Countywide conveyance system shall be consistent with the standards and criteria adopted in Policies DRG 5.1 and DRG 5.2 and *Exhibit DRG: Level of Service Standards For New Development* as implemented within the County's Land Development Code.
- D **OPERATION AND MAINTENANCE STANDARDS:** Upon completion of individual basin evaluations an ongoing operation and maintenance program shall be evaluated by the County to maintain the optimum level of flood protection as defined in the basin evaluations and adopted in the Comprehensive Plan. The Plan shall be amended to adopt criteria and standards for maintenance as to each basin.





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OBJECTIVE DRG 2 FACILITY REGULATION, CONSTRUCTION, DESIGN AND MAINTENANCE

Protect the public safety, welfare and property from hazards of flooding through effective regulation, design and maintenance of stormwater facilities and systems.

Policy DRG 2.1 Land Development Code

The County shall continue to amend the Land Development Code (including surface water management standards) to ensure consistency with Chapter 40C-47, F.A.C, and 40C-4 F.A.C., of the St. Johns River Water Management District governing stormwater management.

Policy DRG 2.2 Flood Prone Area Delineation

The County shall continue to administer FEMA regulatory program requirements and adopt FIRM in the absence of site specific mapping.

Policy DRG 2.3 Flood Prone Area Regulation

The County shall address areas subject to flooding problems collaboratively with the development community, and in the development review process permit only minor modification with compensating storage of the 100-year flood elevation.

Policy DRG 2.4 Conservation Easements

The County shall continue to require the dedication of conservation easements as a means of protecting the functions of floodways.

Policy DRG 2.5 Facility Construction

The County shall prohibit alteration of existing structures and natural drainage systems that would potentially endanger public safety and/or have an adverse effect on property, water quality or other natural resources.

Policy DRG 2.6 Underdrain Regulations

The County shall evaluate the Land Development Code by December 31, 2002 to effectively address the known problems associated with many underdrain facilities and provide feasible alternatives.

Policy DRG 2.7 Facility Development Regulations

The County shall continue to rely upon the Land Development Code's Surface Water Management Standards and the Building Code to ensure that the design, construction and operation of stormwater facilities is consistent with adopted engineering standards and encourages the use of best available management practices.



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OBJECTIVE DRG 3 NATURAL RESOURCE IMPACTS

The County shall maintain or improve the quality and function of natural drainage systems, ground and surface waterways, recharge areas and associated natural resources through emphasis on non-structural approaches to floodplain management. Ground water and recharge areas are further protected by *Objective: CON 1: GROUNDWATER PROTECTION* and its associated policies; and, *Objective CON 2: SURFACE WATER PROTECTION* and its associated policies.

Policy DRG 3.1 Non-Structural Floodplain Management

The County shall continue to rely on a non-structural approach to floodplain management in order to maximize flood-holding capacity and minimize public expenditure for capital and maintenance costs.

Policy DRG 3.2 Surface Water Quality Plan

The County shall continue implementation of its surface water quality management plan to monitor and protect the quality and functioning of surface and surficial groundwater resources. This program shall continue coordination with the St. Johns River Water Management District, Florida Department of Environmental Protection and U. S. Environmental Protection Agency stormwater programs to increase consistency with programs such as the NPDES and TMDLs.

Policy DRG 3.3 Agency Coordination

The County shall continue to work with the St. Johns River Water Management District, the Federal Emergency Management Agency and other agencies to update mapping of floodways, identify point sources of pollution, conduct basin specific studies and develop regulations for the protection of drainageways.

Policy DRG 3.4 Stormwater Runoff Treatment

The County shall continue to rely on the Land Development Code and encourage non-structural techniques to ensure stormwater runoff be treated to reduce the pollutant loads discharged into receiving waters.

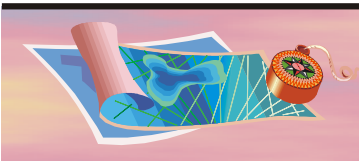
Policy DRG 3.5 Development Regulations

The County shall prohibit development practices, which create over-drainage of land and soil.

Policy DRG 3.6 Groundwater Recharge/Facility Design

The County shall encourage on-site detention and/or retention facilities placement in upland areas to maximize groundwater recharge.





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Policy DRG 3.7

Education Program/Brochure

The County shall continue its commitment to its public education program, supporting all appropriate videos, brochures, and other means of providing education in the following instructional areas: the causes and potential for flooding; the importance of natural conditions and vegetation to water quality maintenance; the importance of keeping drainage ways unobstructed; available County information such as Flood Insurance Rate Maps; County and State Code requirements; and ways to maintain water quality of lakes, conveyances and retention ponds. Brochures for public dissemination shall continue to be developed.

Policy DRG 3.8

Groundwater Recharge

The County shall continue to evaluate its protection of recharge areas with each Evaluation and Appraisal Reporting cycle and amend regulations as necessary to ensure that natural recharge of groundwater from rainfall is not decreased.



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OBJECTIVE DRG 4 FUNDING

The County shall implement innovative and feasible regulations and financing mechanisms to eliminate existing deficiencies, maintain existing systems and plan for future needs.

Policy DRG 4.1 Funding for Drainage Improvements

The County shall investigate the implementation of a stormwater utility system or other funding mechanism for financing existing and future Stormwater Program needs.

Policy DRG 4.2 Regional Stormwater Facilities

The County shall study and assess the feasibility and practicality of implementing area-wide or regional stormwater treatment facilities.

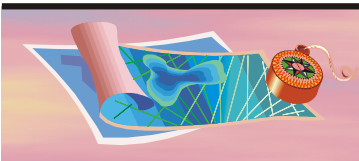
Policy DRG 4.3 Middle St. Johns Basin Stormwater Working Group

The County shall coordinate, through the Middle St. Johns Basin Stormwater Working Group, the joint review, implementation and funding of basin master plans and associated improvements.

Policy DRG 4.4 Infrastructure Coordination

The County shall continue to coordinate the implementation of stormwater projects with roadway, utility or other facility improvements to maximize the efficient use of funds and to coordinate the proper sizing of new and replacement structures.





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OBJECTIVE DRG 5 LEVELS OF SERVICE

Established levels of service standards are performance standards which relate to the capacity, water quality treatment and flood control of stormwater facilities in order to meet minimum applicable State and Federal standards for water quality and flood protection.

Policy DRG 5.1 **New Development and Redevelopment Service Level Standards**

The County shall require that all new development and redevelopment to meet the design criteria set forth in *Exhibit DRG: Level of Service Standards For New Development* and implemented through the County's Land Development Code.

Policy DRG 5.2 **New Development and Redevelopment Service Level Standards**

The County shall require all new development and redevelopment to meet the following stormwater quality and quantity criteria implemented within the Land Development Code:

- A All site alteration activities shall provide for such water retention, settling structures and flow alteration devices as may be necessary to ensure that post-development runoff will not be greater than the pre-development runoff.
- B Permitted rates and volumes of stormwater runoff, whether discharged into natural or artificial water courses, shall meet existing water quality standards or ensure that the receiving water body is not degraded below the minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-302, F. A. C., whichever is greater.
- C No site alteration shall cause siltation of wetlands, pollution of downstream wetlands, reduce the natural retention or filtering capabilities of wetlands or cause a health hazard.

Policy DRG 5.3 **Agency Standards**

The County shall regulate development and redevelopment consistent with and meeting the minimum requirements of the St. Johns River Water Management District Rule 40C-42, F. A. C., Regulation of Stormwater Discharge and Rule 40C-4, F. A. C., Management and Storage of Surface Waters, and the Stormwater Discharge Rule; Ch. 17-25, Ch. 17-3, F. A. C., implemented by the Florida Department of Environmental Protections which to protect and prevent further degradation of surface and ground waters.

Policy DRG 5.4 **Water Quality Monitoring and Deficiency Correction Program**

The Comprehensive Plan shall be amended as necessary to incorporate the long range deficiency correction and monitoring programs, such as those required by the EPA and FDEP into the Capital Improvements Element.



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OBJECTIVE DRG 6 INTERGOVERNMENTAL COORDINATION

The County shall work with all parties to maximize funding, education, deficiency correction of existing stormwater management facilities, construction of new stormwater management facilities and surface water protection in Seminole County.

Policy DRG 6.1 Intergovernmental Coordination

The County shall continue to work collaboratively with the Stormwater Working Group, the Florida Department of Environmental Protection, the U.S. Environmental Protection Agency, the Federal Emergency Management Agency, and other agencies to maximize its goals relating to funding drainage improvements, water quality improvements, and environmental protection projects.

Policy DRG 6.2 The Seminole County Watershed Atlas

The County shall continue to coordinate with the Municipalities, other Local Governments, State, and Federal agencies to allow the Seminole County Watershed Atlas to reflect the most current and up-to-date information on new changes in regulations, water quality, other environmental parameters, or other types of data as decided by the Seminole County Stormwater Division.

