

## ***SOUTH MIAMI-DADE COUNTY WATERSHED STUDY COVER SHEET***

### ***Sub-task 1.8: Parameters and Thresholds***

**Subject:** Thresholds for water resources, natural communities, economic, land use and infrastructure parameters.

#### **Final Work Product:**

Report with a description and analysis of thresholds for each parameter, including methodologies and assumptions.

#### **Submission Date to South Florida Regional Planning Council Project Manager:**

Interim Work Product Draft – January 13, 2004

Draft Final Work Product – February 10, 2004

Draft Final Work Product revised to incorporate PMT comments and submitted to WSAC – March 11, 2004 (email) – March 18, 2004 (hard copy)

Final Work Product revised to incorporate PMT, WSAC and TRC comments – May 20, 2004

#### **Deliverables:**

Report (3 electronic copies and 5 hard copies)

#### **Watershed Study Advisory Committee Final Review – July 22, 2004**

##### **Water Resources Primary Parameters Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	1	12	6	0	0

There are no secondary water resources parameters.

#### **Watershed Study Advisory Committee Final Review – August 24, 2004**

##### **Natural Communities Primary Parameters Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	2	7	11	0	0

There are no secondary natural communities parameters.

**Land Use Primary Parameters  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	1	9	12	0	0

There are no secondary land use parameters.

**Economic Conditions Primary Parameters  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	1	9	12	0	0

**Economic Conditions Secondary Parameters  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	0	7	15	0	0

**Infrastructure Primary Parameters  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	0	2	19	0	0

**Infrastructure Secondary Parameters  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	0	3	19	0	0

**Executive Summary, Introduction and Conclusion  
Consensus Score**

<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Number of Members</b>	0	10	10	0	0

***South Florida Regional Planning Council***  
***Institute for Community Collaboration***  
**Consensus Definitions**

- 5 – Wholehearted Support
- 4 – Support
- 3 – Neutral but Supports Fully to Outside World
- 2 – Questions Pending
- 1 – Blocks Any Decision

Consensus is defined as everyone ranking a work product no less than three.

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**Appendix A:**

- Vision Statement
- Watershed Study Advisory Committee Goals
- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003 – Land Use Objective 3 and Land Use Policy 3E

## LIST OF ACRONYMS

BBPI	Biscayne Bay Partnership Initiative
BBRRT	Biscayne Bay Regional Restoration Coordination Team
BBCW	Biscayne Bay Coastal Wetlands
CDMP	Comprehensive Development Master Plan, May 1997, as amended through April 2003
CDWWTP	Central Miami-Dade Wastewater Treatment Plant
CERP	Comprehensive Everglades Restoration Plan
DERM	Miami-Dade County Department of Environmental Resources Management
DFWP	Draft Final Work Product
DP&Z	Miami-Dade County Department of Planning and Zoning
EAR	Evaluation and Appraisal Report
EEL	Environmentally Endangered Lands
EPA	Environmental Protection Agency
EMC	Event Mean Concentration
ET	Evapotranspiration
FAR	Floor-to-Area Ratio
FDEP	Florida Department of Environmental Protection
FFWCC	Florida Fish and Wildlife Conservation Commission
FISH	Florida Inventory of School Houses
FIHS	Florida Intrastate Highway System
FIU SERC	Florida International University Southeast Environmental Research Center
FLUCCS	Florida Land Use Category Classification System
FPLOS	Flood Protection Level of Service
FMRI	Florida Marine Research Institute
FNAI	Florida Natural Areas Inventory
FSUTMS	Florida Standard Urban Transportation Model Structure
FWP	Final Work Product
IWP	Interim Work Product
LEC	Lower East Coast
LOS	Level of Service
LUP	Adopted 2015 Land Use Plan
MGD	Millions of Gallons per Day
MDWASD	Miami-Dade County Water and Sewer Department
MFL	Minimum Flows and Levels
NDWWTP	North Dade Wastewater Treatment Plant
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NWI	National Wetland Inventory
OCOQ	One Community One Goal
QQTQD	Quality, Quantity, Timing and Distribution

**LIST OF ACRONYMS (continued)**

PMT	Project Management Team
SDWWTP	South Dade Wastewater Treatment Plant
SFWMM	South Florida Water Management Model
SIP	State of Florida State Air Implementation Plan
SFWMD	South Florida Water Management District
SMDWSP	South Miami-Dade Watershed Study and Plan
TRC	Technical Review Committee
USFWS	United States Fish and Wildlife Service
WQLOS	Water Quality Level of Service
WSAC	Watershed Study Advisory Committee
UDB	Urban Development Boundary
UIA	Urban Infill Area
XP-SWMM	XP Software Stormwater Management Model

## **EXECUTIVE SUMMARY: SUB-TASK 1.8 – PARAMETERS AND THRESHOLDS**

### **Overview of the South Miami-Dade Watershed Study and Plan**

The South Miami-Dade Watershed, an approximately 370 square mile area located in the southeastern portion of Miami-Dade County, is increasingly recognized as one of the most critical watersheds in Florida. The Watershed plays a vital role in the health of Biscayne Bay as well as providing for the urban and agriculture needs of the County.

The South Miami-Dade Watershed Study and Plan (SMDWSP) is a long-term land planning and water resources study required by the Miami-Dade County Comprehensive Development Master Plan. Divided into five major task areas, the study includes a wide-ranging look at South Miami-Dade County's population growth; infrastructure; land ownership, including agriculture, industrial and urban land uses; pollution; water resources; wildlife; and natural areas.

The SMDWSP is being developed consistent with the objectives of CDMP Land Use policy 3E, which was adopted by the Board of County Commissioners on October 10, 1996. The objectives of this policy are:

- 1) To identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic and community values of Biscayne National Park;
- 2) To identify and establish mechanisms for protecting constitutional private property rights;
- 3) To support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area; and
- 4) To assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.

To help ensure that Land Use Policy 3E was met, the Watershed Study Advisory Committee (WSAC) formulated seven goals for the SMDWSP (see Appendix A). While not specifically articulated in Land Use Policy 3E, the WSAC goals clearly reflect the importance of environmental and economic sustainability and community character. The purpose of the SMDWSP is to formulate a preferred land use scenario that meets these major planning goals.

The Study will formulate and analyze land use scenarios to assess how each scenario performs relative to the Study objectives and goals and measure potential impacts of each scenario on water resources, wildlife habitat, infrastructure, agriculture, the economy and property rights. This evaluation of impacts will help form a fourth "preferred" scenario.

The results of this collaborative study process will be the development of a Plan designed to balance the various competing interests in South Miami-Dade – providing the framework for a sustainable economy and environment through the year 2050. The Plan will contain the policies, strategies and procedures necessary for implementing the preferred scenario. The Sub-task 1.8 report establishes the parameters for measuring land use scenario performance.

## 1.0 INTRODUCTION

### *The Planning Process*

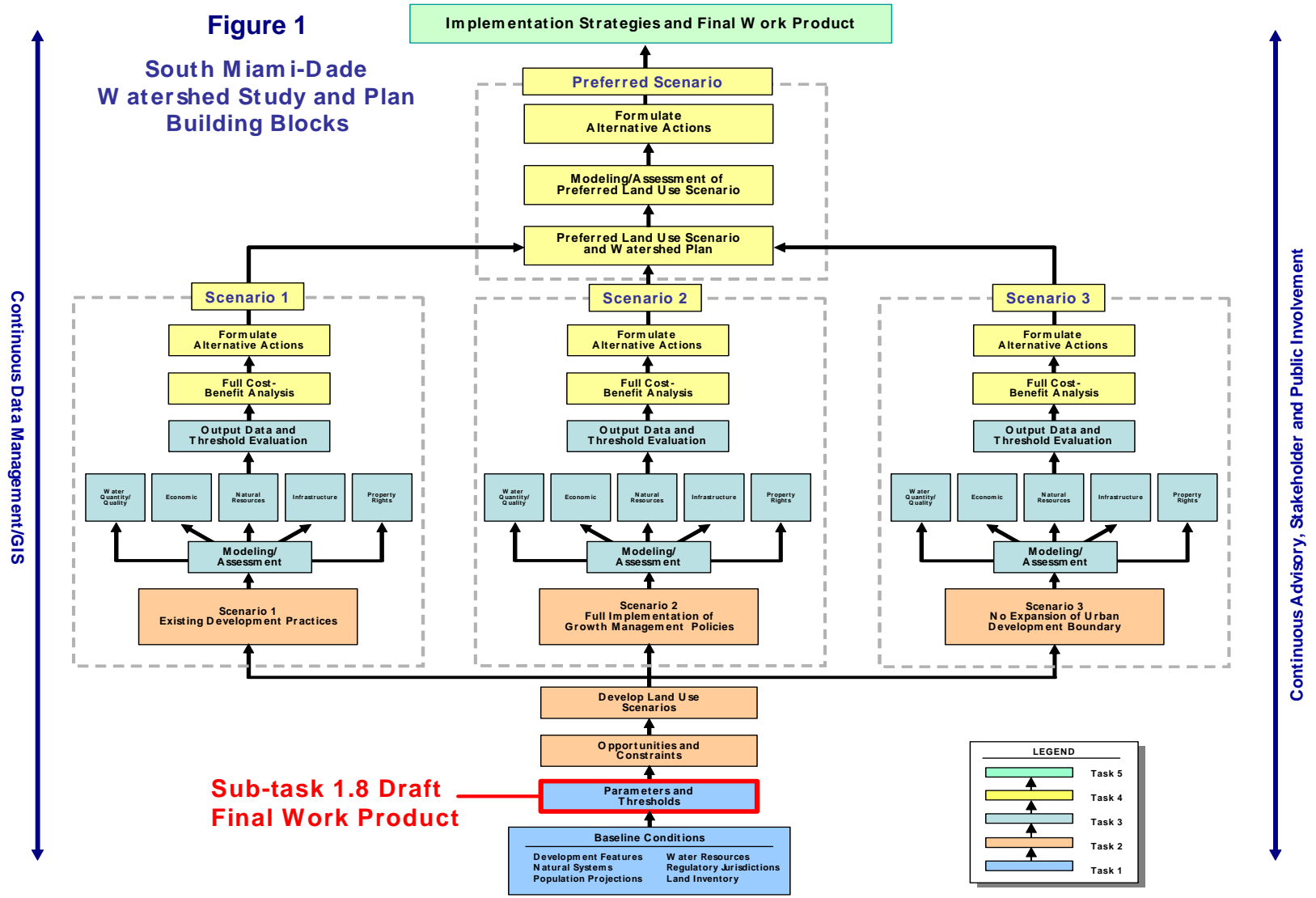
The successful formulation of any water resources or land use plan requires a valid comparison of alternatives against the current or baseline condition, using a consistent set of metrics for measuring how each alternative performs. The results of the assessment of each alternative are then compared to specific planning goals and objectives. Based on this comparison a preferred alternative is then selected.

The SMDWSP is based on standard accepted practices for the formulation of large-scale water and land use plans. As depicted in Figure 1, the first step in the planning process is to establish and document the baseline condition. For the SMDWSP this was completed in Sub-tasks 1.1 through 1.7 in June 2004. The second part of task one (Sub-task 1.8) is to establish the **parameters and thresholds** for measuring the performance of various alternatives or scenarios. The second task is the actual formulation of scenarios based on projected population levels in 2025 and 2050. Specifically, for the SMDWSP three policy approaches will be evaluated for the two different population levels - - resulting in six scenarios. In task three, each of the six scenarios will be evaluated using the parameters and thresholds discussed in this report. As discussed below, this evaluation will include an assessment of the impact of each scenario on water resources, natural resources, community character, employment and economy and infrastructure. Based on this evaluation of performance of the six scenarios, a preferred land use scenario will be formulated in task four. The performance of the preferred scenario will be evaluated against the parameters and thresholds in this report. Once a final preferred scenario is selected, implementation strategies will be developed in task five. Figure 1 highlights Sub-task 1.8 in the context of the overall SMDWSP planning process.

### *Measuring Scenario Performance*

One of the most crucial components of the SMDWSP is the development of measurable characteristics (parameters) and associated tolerance levels (thresholds) for assessing land use scenarios and determining if the overall planning objectives are met. For the SMDWSP, these planning objectives are reflected in the Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003 (CDMP), Land Use Policy 3E, and the Watershed Study Advisory Committee's (WSAC) goals and vision statement. These documents are provided in Appendix A.

The SMDWSP parameters, when viewed together, are the characteristics required for a sustainable South Miami-Dade County environment and economy. Further, the parameters help paint a picture of the desired community character - - clean water, safe roads, open space, a landscape of mixed uses, including agriculture. For each parameter, thresholds will establish:



- 1) The minimum or maximum limits, conditions or concentrations acceptable; or
- 2) The baseline condition (benchmark) from which a comparative analysis will be conducted to determine the relative performance of each scenario.

As noted above, the parameters and thresholds established in Sub-task 1.8 will be utilized during the assessment phase of the project to determine the performance of each of the six scenarios (three policy approaches at the projected population levels for 2025 and 2050). Output data from modeling and impact assessments (Sub-tasks 3.1 through 3.5) will be compared to the threshold established for each parameter. This comparison (Sub-task 3.6) will determine whether a particular scenario meets the overall planning objectives for a sustainable South Miami-Dade County. This information will also be used to define and formulate actions that may be necessary to mitigate impacts from the land use scenarios.

It is important to note that all parameters will not carry the same level of importance or weight. In this regard, the performance of each scenario will be determined based on an evaluation of the overall level of compliance with the thresholds for all parameters. For certain parameters compliance with the threshold may be given great weight, resulting in a “pass/fail” test. For other parameters, non-compliance will be considered in light of the overall performance of the scenario. Further, it is important to understand, that as noted in Section 3.0, the 20 parameters selected are designed to evaluate five different functional categories. As such, by design a direct relationship may not exist between many of the parameters.

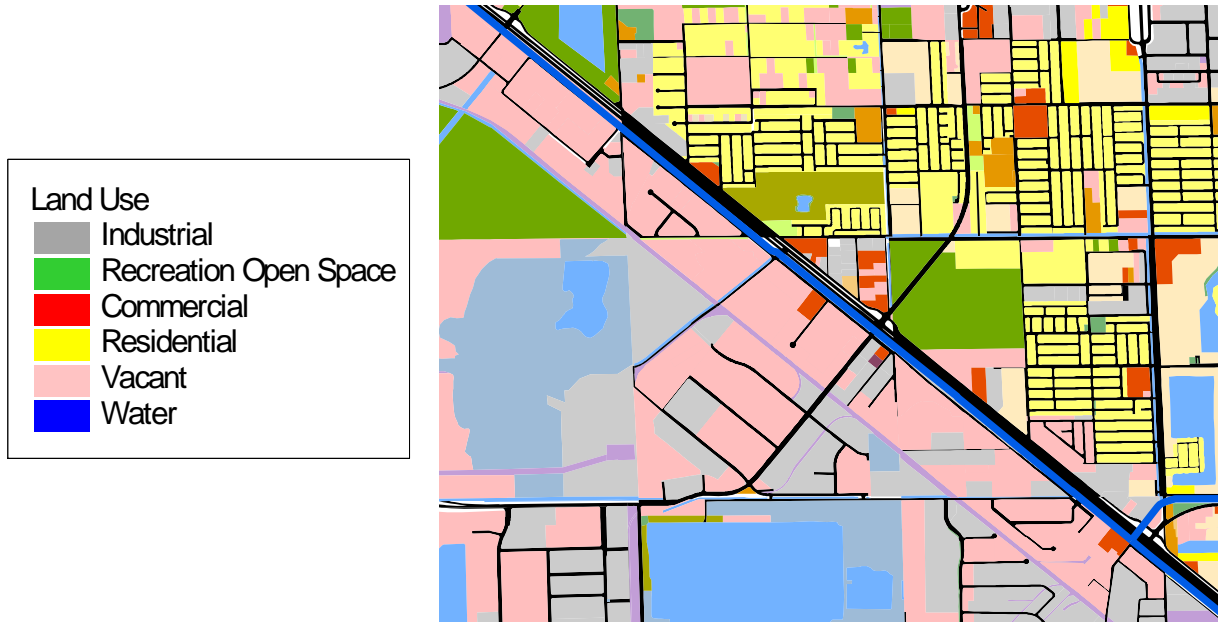
#### ***Example of How Parameters and Thresholds are Used in the SMDWSP***

A key attribute to community character and a healthy environment is clean water. As such, understanding the effect of future land use on surface water quality, including Biscayne Bay, is an integral part of the SMDWSP. The example below depicts three hypothetical land use scenarios and how each could affect surface water quality. The matrix at the end of this section provides a score sheet for assessing the performance of each scenario. In this example, compliance will be based on a relative comparison of outputs from the scenarios to each other and to a benchmark threshold (e.g., relative changes in water quality resulting from each scenario compared to the current condition).

NOTE: The scenarios and units of measure below are for illustration purposes only and do not reflect actual analysis.

*Example 1: Stormwater Discharge Quality*

Existing Land Use: Abundance of Vacant Land (pink areas shown below)



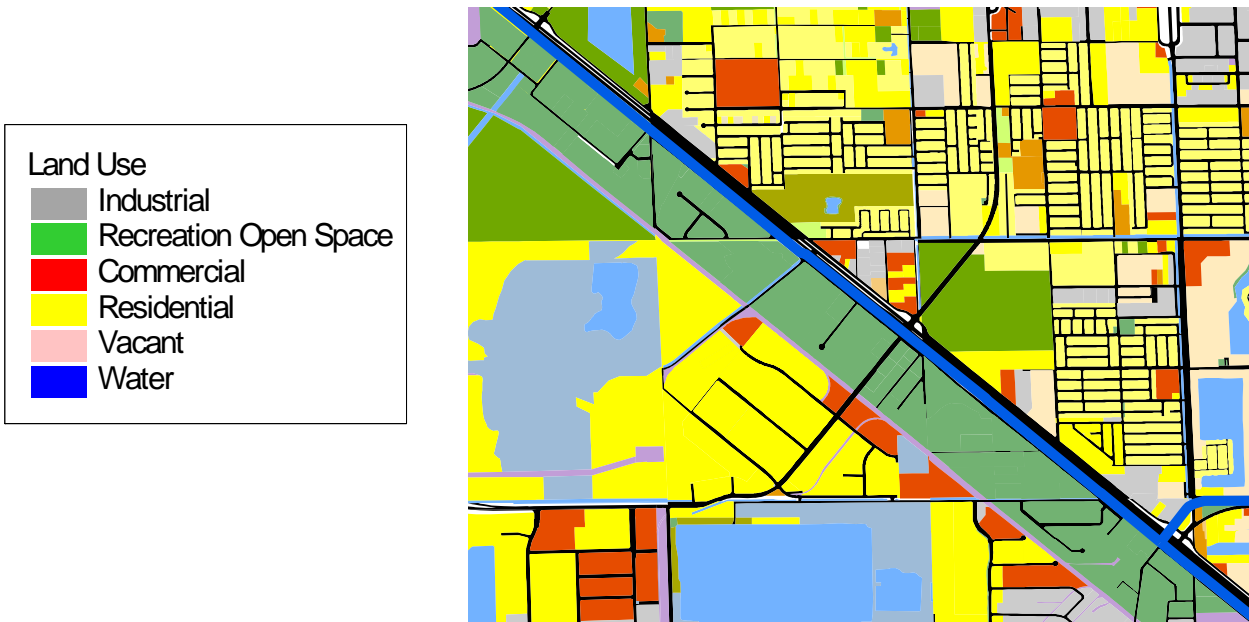
Pollutant Levels: Suspended Solids – 2; Nitrogen – 2; Lead – 2

Scenario A: Abundance of Residential Land (yellow areas shown below)



Pollutant Levels: Suspended Solids – 5; Nitrogen – 5; Lead – 5

Scenario B: Abundance of Recreation and Open Space Land (green areas shown below)



Pollutant Levels: Suspended Solids – 1; Nitrogen – 1; Lead – 1

**Table 1**  
**Example Scoring Matrix**

<b>Pollutant</b>	<b>Existing</b>	<b>Scenario A</b>	<b>Scenario B</b>
Suspended Solids	2	5	1
Nitrogen	2	5	1
Lead	2	5	1

Based on the hypothetical example above, scenario B, in a comparative analysis against the other two scenarios would be selected as the best performer from a water quality perspective.

*Example 2: Recreation and Open Space*

A characteristic of a healthy and viable community is adequate parks and recreation facilities – a land use/community character parameter. Acres of local recreation open space is the measurement used by Miami-Dade County to gauge adequate park service. As defined in the Recreation and Open Space Element of the CDMP, recreation and open space counted when measuring level of service shall include: 1) public local parks which exist or are committed by covenant; 2) public school and college playfields; 3) portions of private recreation open space; and County-owned or operated parks that have been incorporated or annexed into municipalities but in which the majority of park program participants are unincorporated area residents.

In this case, compliance with the threshold is based on meeting a minimum level (set number of acres) and not a comparative analysis as in example one above.

***Previous Sub-task 1.8 Work Products and Reviews***

On November 6, 2003, Keith and Schnars (K&S) discussed the formulation of parameters and thresholds with the Technical Review Committee (TRC). The TRC was asked for its initial thoughts on potential parameters and sources of information on the subject. On November 12, 2003, K&S submitted a draft list of parameters to the Client Project Management Team (PMT) for review and discussion. On January 13, 2004, K&S submitted a *Parameters and Thresholds* Interim Work Product (IWP) to the PMT. Subsequent to the IWP submittal, K&S discussed this issue with the PMT and professional staff from Miami-Dade County. On February 10, 2004, K&S submitted a *Parameters and Thresholds* Draft Final Work Product (DFWP) to the PMT. Parameters and thresholds were discussed with the WSAC during their January 29, 2004 and February 26, 2004 meetings and with the TRC on April 14, 2004.

Based on these reviews, written comments from PMT members and numerous discussions within K&S, the parameters and thresholds were developed. PMT, WSAC and TRC comments were incorporated into this Final Work Product (FWP) to the extent appropriate and within the Scope of Services for the SMDWSP contract. A description of key submittal and review dates is provided in Table 2.

**Table 2**  
**Sub-task 1.8: Parameters and Thresholds Submittal and Review Dates**

<b>Milestone</b>	<b>Date</b>
TRC Briefing	November 6, 2003
Keith and Schnars/PMT meeting on draft initial Parameters	November 12, 2003
Submit IWP to PMT	January 13, 2004
WSAC discussion of Parameters	January 29, 2004
Keith and Schnars/Miami-Dade County DP&Z staff meeting on IWP	February 3, 2004
Submit draft FWP to PMT	February 10, 2004
WSAC discussion of Parameters and Thresholds	February 26, 2004
Submit draft FWP to WSAC	March 11, 2004
WSAC meeting on draft FWP	March 25, 2004
Submit draft FWP to TRC	March 31, 2004
TRC meeting on draft FWP	April 14, 2004
Submit FWP	May 20, 2004
WSAC Final Acceptance/Sub-task Complete	July 22, 2004/August 24, 2004

## 2.0 METHODOLOGY FOR SUB-TASK 1.8

### *Parameters*

As a first step to develop the list of potential parameters, K&S reviewed federal, State and local plans identified in Sub-tasks 1.1 through 1.7, the WSAC vision and goals, and Land Use Policy 3E to identify a list of parameters that were relevant and applicable for measuring the impacts of potential land use scenarios on the environment and economy of South Miami-Dade County. Further, parameters were developed in light of the numerous comments on the importance of community character. The parameters were refined based on consideration of what was measurable and feasible to evaluate, and then grouped according to the following functional categories:

- Water Resources;
- Natural Communities;
- Land Use/Community Character;
- Employment/Economy; and
- Infrastructure.

Land Use Policy 3E and the WSAC goals guided K&S in the development of the parameters and thresholds. A WSAC goals matrix was developed to provide an organizing framework and gap analysis to ensure that the goals of the SMDWSP would be addressed by evaluating the recommended parameter. Based on this exercise and input from the PMT, WSAC and TRC, certain parameters were revised, added or deleted. Specifically, K&S has ensured that compliance with each of the seven WSAC goals is addressed by one or more parameters. The linking of goals with primary and secondary parameters for each of the five major categories of parameters is described in Table 3.

The next step was delineation of the parameters based on two levels of importance: Primary Parameters and Secondary Parameters. Primary Parameters are defined as those parameters that on a stand-alone basis are generally integral to meeting the goals of the SMDWSP. As such, primary parameters will receive more weight when the overall performance of each scenario is determined. For example, ensuring a healthy and sustainable Biscayne Bay (WSAC goal number four) requires the proper quality, quantity and distribution of water. To assess the performance of future land use scenarios, three of the four primary water resources parameters were selected to measure achievement of this goal: Stormwater Discharge Quality, Groundwater Supply, and Surface Water Flows/Distribution.

Secondary Parameters, while important, may not individually determine the performance of a scenario. Compliance with these parameters will be evaluated in the context of the overall performance of the scenario. For example, failure to meet the threshold for the “wastewater” parameter (a secondary Infrastructure parameter) may not, in and of itself, mean a scenario does not meet the goals of the SMDWSP provided the goals are met through projects and programs reflected in other parameters or alternative actions (e.g., funding additional wastewater collection and treatment facilities).

## ***Thresholds***

For each parameter an associated threshold was developed. For certain parameters, adopted agency policies were determined to be an acceptable threshold as a starting point for discussion. For example, Section 373.036 of Florida Statute requires the *Lower East Coast Regional Water Supply Plan* (LEC Plan) to meet water demands up to a 1-in-10-drought event. For the groundwater supply parameter this generally accepted policy was determined to provide an appropriate threshold. In other cases, adopted policy thresholds may be inconsistent with the goals of the SMDWSP. In such cases the K&S proposed a different threshold based on research and professional judgment. An example is found in the threshold for the parks and recreation parameter. The currently adopted Miami-Dade County threshold for local parks and recreation open space is 2.75 acres per 1,000 permanent residents. Based on common practices of nearby municipalities and the explicit open space/recreation goal of the WSAC, K&S felt that it was appropriate to evaluate the adopted standard and create a target threshold of 3.0 acres per 1,000 permanent residents.

For some parameters lacking adopted standards, K&S has proposed thresholds based on relevant literature, accepted practice, input from the PMT and WSAC, and best professional judgment. A good example of this situation is the threshold for the Land Use/Community Character “Development Patterns” parameter. While explicit thresholds have not been established by Miami-Dade County, compliance with this parameter is important to meeting all seven WSAC goals. As such, K&S proposes a prototypical composite of land use factors, such as population density, land use types and modes of transportation.

For certain parameters, such as water quality, benchmarks will be established in lieu of “pass/fail” thresholds. A comparative approach will be utilized to evaluate the performance of the land use scenarios against the benchmarks. In the case of water quality, this approach is necessary because of the limitations of the XP-SWMM water resources model in accurately determining actual levels of pollutants.

## ***Parameters and Thresholds***

The 20 parameters and associated thresholds are presented in Sections 3.0 and 4.0. The parameters are organized based on the five major categories listed above and each is assigned a reference number. For each parameter, information is presented in a summary sheet format that includes the threshold, justification, evaluation method and the source.

**Table 3**  
**South Miami-Dade Watershed Study and Plan**  
**Parameters and Watershed Study Advisory Committee Goals Matrix**

Ref #	Parameters	Scope of Threshold	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Goal #6	Goal #7
			Create vibrant communities with identities that achieve environmental, economic and social sustainability.	Honor private property rights.	Support economically diverse agriculture.	Ensure a healthy and sustainable Biscayne Bay and Biscayne and Everglades National Parks.	Promote open space, tourism and recreational facilities based on natural wonders.	Welcome other compatible enterprises.	Preserve historic quality and rural character with a strong sense of local community and stewardship.
<b>Water Resources - Primary Parameters</b>									
WR-1	Stormwater Discharge Quality	Pollutants measured by XPSWMM	X	X	X	X	X	X	
WR-2	Groundwater Supply	Water supply needs will be met during a 1-in-10 year drought	X	X	X	X		X	
WR-3	Surface Water Flows/Distribution	Annual volume of run-off into Biscayne Bay	X	X	X	X	X	X	
WR-4	Flood Protection	Design storm return period for primary canals and roadways	X	X	X			X	
<b>Water Resources - Secondary Parameters – NONE</b>									
<b>Natural Communities - Primary Parameters</b>									
NC-1	Tidal Wetlands	No net loss of native plant-dominated tidal wetland functions	X	X	X	X	X	X	X
NC-2	Transitional Wetlands	No net loss of native plant-dominated transitional wetland functions	X	X	X	X	X	X	X

Table 3									
South Miami-Dade Watershed Study and Plan									
Parameters and Watershed Study Advisory Committee Goals Matrix									
Ref #	Parameters	Scope of Threshold	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Goal #6	Goal #7
NC-3	Freshwater Wetlands	No net loss of native-dominated freshwater wetland functions	X	X	X	X	X	X	X
NC-4	Remnant Natural Forests	No net degradation of the remnant natural forest communities and buffers	X	X	X	X	X	X	X
<b>Natural Communities - Secondary Parameters – NONE</b>									
<b>Land Use/Community Character - Primary Parameters</b>									
LU-1	Development Densities	Acres of urban, suburban, exurban and rural land	X	X	X	X	X	X	X
LU-2	Rural Land	Acres of agricultural land uses outside the existing UDB	X	X	X	X	X	X	X
LU-3	Proximity of Housing and Employment to Transit	Resident and workforce population within 1/2 mile of transit	X	X				X	
LU-4	Parks, Recreation and Open Space	Acreage and distribution of parks	X	X			X		X
<b>Land Use/Community Character - Secondary Parameters – NONE</b>									
<b>Economic Conditions - Primary Parameters</b>									
EC-1	Economic Base	Employment by industry	X		X		X	X	

**Table 3  
South Miami-Dade Watershed Study and Plan  
Parameters and Watershed Study Advisory Committee Goals Matrix**

Ref #	Parameters	Scope of Threshold	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Goal #6	Goal #7
<b>Economic Conditions - Secondary Parameters</b>									
EC-2	Cost of Housing	Comparison of baseline housing costs to scenarios	<b>X</b>		<b>X</b>			<b>X</b>	
EC-3	Mix of wages	Household Incomes	<b>X</b>		<b>X</b>		<b>X</b>	<b>X</b>	
<b>Infrastructure - Primary Parameters</b>									
IS-1	Transportation	Adopted level of service	<b>X</b>					<b>X</b>	<b>X</b>
IS-2	Schools	Florida Inventory of School Houses Capacity	<b>X</b>					<b>X</b>	
<b>Infrastructure - Secondary Parameters</b>									
IS-3	Potable Water	Plant capacity and expansion costs	<b>X</b>			<b>X</b>		<b>X</b>	
IS-4	Wastewater	Plant capacity and expansion costs	<b>X</b>			<b>X</b>		<b>X</b>	
IS-5	Air Quality	Tons of pollutants per day	<b>X</b>			<b>X</b>		<b>X</b>	

### 3.0 PRIMARY PARAMETERS

#### 3.1 Water Resources

<b>Reference Number:</b>
<b>WR-1 (Primary)</b>
<b>Parameter:</b>
<i>Stormwater Discharge Quality</i>
<b>Subject Area:</b>
Water Resources
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park.

**WR-1 (continued)**

**Threshold:**

Although the CDMP contains water quality standards, the XP-SWMM Model is not calibrated to determine compliance with these standards. The threshold for this parameter is a comparative assessment of the pollutants shown in Table 4. As such, the XP-SWMM Model will be used to measure changes in water quality resulting from the land use scenarios. The comparative assessment will be evaluated against the current condition model output that includes existing land use. A threshold has not been established by rule for this parameter.

**Table 4**

Pollutant
5-day Biochemical Oxygen Demand (BOD <sub>5</sub> )
Chemical Oxygen Demand (COD)
Total Suspended Solids (TSS)
Total Dissolved Solids (TDS)
Total Nitrogen (TN)
Nitrate-Nitrite (Nox-N)
Ammonia Nitrogen (NH <sub>3</sub> -N)
Total Kjeldahl Nitrogen (TKN)
Total Phosphorus (TP)
Dissolved Phosphorus (DP)
Total Cadmium (Cd)
Total Copper (Cu)
Total Lead (Pb)
Total Zinc (Zn)

Source: Miami-Dade County Stormwater Management Master Plan

**WR-1 (continued)**

**Threshold Justification:**

Stormwater discharge quality is a primary parameter that provides a direct estimate of the impact of land use on surface water quality in water bodies such as the canals in South Miami-Dade County leading into Biscayne Bay. The pollutants to be assessed include a comprehensive list that is based on the Miami- Dade County Department of Environmental Resources Management (DERM) Stormwater Master Plan using the United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) stormwater permit monitoring requirements, Miami-Dade County Effluent and Water Quality Standards (Chapter 24-11(2)), and State of Florida Water Quality Criteria as published in Chapter 62-302 of the Florida Administrative Code (metals based on a total hardness of 250 milligrams/liter).

Miami-Dade County selected the statewide Water Quality Level of Service WQLOS criteria that uses the stormwater quality rules “storage volume” criteria for comparison. The purpose of the WQLOS criteria is to provide a benchmark by which existing or future urban stormwater quality, within a given sub-basin, may be measured or compared to the stormwater quality within other subbasins. A concentration-based WQLOS indicator was chosen for the Miami-Dade County stormwater master plan because it will provide a direct measurement of which criteria are achieved and the degree of exceedance for those which are not. In addition, the relative estimate in pollutant concentration will be the same as the relative estimate in pollutant load.

The pollutants identified are commonly found in urban stormwater runoff. Through the NPDES process, Miami-Dade County staff acquired local measurements of these pollutant parameters for selected land use types. This local data was used to develop reasonable estimates of stormwater pollutant concentrations by land use type. These estimates will be used to assess the impacts of various land uses on the water quality of downstream water bodies through comparisons of pollutant loads. Because these are estimates with some uncertainty and the accuracy of the modeling is limited, concentrations and concentration limits were not selected, but rather average annual loads will be assessed.

**WR-1 (continued)****Evaluation Method (Task 3):**

The XP-SWMM DERM Model will be utilized to assess water quality. The current condition model for each basin will be executed and the annual pollutant loadings will be estimated using the XP-SWMM model and DERM procedures. Annual pollutant loads will be estimated for the referenced 14 constituents (indicator pollutants) for the baseline condition and the three land use scenarios for years 2025 and 2050. Water quality simulation runs will be conducted for the continuous wet (25%), average (50%), and dry (75%) probability years of rainfall for all the land use scenarios.

The following information will be used:

- Event mean concentration (EMC) for each land use and pollutant type considered (mg/L);
- Annual runoff volume generated by each land use for wet, average and dry years (inches/year);
- Land use distribution within the watershed;
- Type, size, and distribution of urban runoff pollution control technologies within the watershed (existing and proposed); and
- Procedure for estimating pollution availability, capture efficiency, and removal efficiency for each pollution control technology.

New development allocated under the land use scenarios will be required to comply with more stringent water management practices than existing development.

The current condition pollutant estimates will become the baseline condition for comparison to the land use scenarios. This comparative assessment will be completed at relevant nodes, sub-basins and control structures to evaluate the land use scenario impacts to water quality.

The extent of saltwater intrusion will be evaluated using available studies and reports to provide recommendations to restrict landward expansion of the salinity line. Best management practices will be evaluated and incorporated into the preferred land use plan.

The LEC Plan will be reviewed to identify groundwater withdrawals that may influence saltwater intrusion. In addition, canal levels will be evaluated in an attempt to maintain water elevations to reduce the potential for saltwater intrusion.

<b>WR-1 (continued)</b>
<b>Source for Parameter:</b>
<ul style="list-style-type: none"><li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003</li><li>• Miami-Dade County Stormwater Management Master Plan</li><li>• Section 62-302, Florida Administrative Code</li></ul>

<b>Reference Number:</b>
<b>WR-2 (Primary)</b>
<b>Parameter:</b>
<i>Groundwater Supply</i>
<b>Subject Area:</b>
Water Resources
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park.
<b>Threshold:</b>
Water supply needs will be met during a 1-in-10 year drought (i.e. 1-in-10 Year Level of Certainty)
<b>Threshold Justification:</b>
Section 373.036, Florida Statutes, requires the Lower East Coast Regional Water Supply Plan (LEC Plan) to meet the water demands for a 1-in-10 year drought event. The 1-in-10 year level of certainty is designed to prevent significant impact to resources up to a 1-in-10 year drought event. It is not intended to be a minimum flow and level. For drought conditions greater than a 1-in-10 year event, it may be necessary to decrease water withdrawals to avoid causing significant impact to the resource. Water shortage triggers are water levels at which phased restrictions will be declared under the SFWMD's water shortage program. The SFWMD can use these triggers to curtail withdrawals and help prevent water levels from declining to and below a level where more significant impacts would occur.

**WR-2 (continued)****Evaluation Method (Task 3):**

The first step in evaluating groundwater supply impacts is to compare population projections, for each scenario including the functional population for the Florida Keys to the 2000 LEC Plan. Projection comparisons will be conducted for populations inside and outside the current UDB. If the spatial distribution of these population levels is relatively consistent to the LEC Plan, additional analysis will not be necessary.

If population distributions differ significantly from those proposed in the LEC Plan, the most recent version of the South Florida Water Management Model may be utilized as the tool to evaluate groundwater. The SFWMM is an integrated surface water-groundwater model that simulates the hydrology and associated water management schemes in the majority of South Florida using climatic data from January 1, 1965, through December 31, 1995. The model simulates the major components of the hydrologic cycle that includes rainfall, evapotranspiration (ET), infiltration, overland and groundwater flow, canal flow, and levee seepage. The model also simulates current and numerous proposed water management control structures and associated operating rules. It has the ability to simulate different water shortage policies, current and proposed, for the different sub-regions in the system.

A measure of the ability to meet water supply demands for the LEC Service Area identified in the LEC Plan is if water supply restrictions can be avoided during the 31-year period of record except in the most severe droughts. SFWMM imposes simulated restrictions on consumptive users when regional water supplies are diminished.

**Source for Parameter:**

- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003
- Miami-Dade County Evaluation and Appraisal Report (EAR), October 2003
- Lower East Coast Regional Water Supply Plan (LEC Plan), 2000

<b>Reference Number:</b>
<b>WR-3 (Primary)</b>
<b>Parameter:</b>
<i>Surface Water Flows to Biscayne Bay</i>
<b>Subject Area:</b>
Water Resources
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park.
<b>Threshold:</b>
Neither Miami-Dade County nor the South Florida Water Management District has established numeric standards for surface water flows and distributions to Biscayne Bay. The threshold for this parameter will be no net decrease in flows into Biscayne Bay based on annual volume of runoff.
<b>Threshold Justification:</b>
The purpose of this threshold is to analyze surface water flows into Biscayne Bay. The goals of the Comprehensive Everglades Restoration Plan (CERP) call for no net decrease in total water flows into Biscayne Bay. CERP is expected to result in changes to timing and distribution of freshwater flows. For the purpose of this study, an evaluation of the quantity of surface water flows for the land use scenarios is necessary for use as a planning input for subsequent CERP efforts.
<b>Evaluation Method (Task 3):</b>
The XP-SWMM DERM model will be utilized to assess surface water annual flow volumes to Biscayne Bay for future conditions. The annual volumes simulated for the three proposed land use scenarios will be compared to the baseline (existing) condition. The parameter will be assessed by continuous simulation for Wet (25%), Average (50%), and Dry (75%) simulations by comparing the existing conditions scenario to the future land use scenarios.
<b>Source for Parameter:</b>
Central and Southern Florida Project, Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, April 1999

<b>Reference Number:</b>
<b>WR-4 (Primary)</b>
<b>Parameter:</b>
<i>Flood Protection</i>
<b>Subject Area:</b>
Water Resources
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long-term objectives for a sustainable South Miami-Dade.

**WR-4 (continued)****Threshold:**

The threshold for Flood Protection is the Miami-Dade County adopted flood protection level of service (FPLOS) for primary canals in the Watershed Study Area, which is described below.

**Primary Canal System Threshold:**

**Table 5**  
**Miami-Dade County Primary Canal System Design Return Periods**

Canal Number	Canal Name	Design Storm Return Period
C-3	Coral Gables	25-year
C-2	Snapper Creek	100-year (southeast of Sunset Drive)
C-100	Cutler	10-year
C-1	Black Creek	100-year (east of Turnpike) 30-year (east of RR) 10-year (west of RR)
C-102	C-102 (Princeton)	10-year
C-103	C-103	10-year
C-111	C-111	N/A*
L31N	L31N	N/A*

\* K&S will confirm model input values with PMT.

The Miami-Dade County FPLOS criteria to be considered in the SMDWSP include canal flooding, structure flooding, and street flooding. All canals should operate within their banks during their respective design floods. Primary canal design criteria vary from 10 to 100 years design floods.

Those areas not covered in Table 5 will be evaluated based on canal stages using a qualitative evaluation to link the results to surrounding land uses with an emphasis in agricultural areas. It is not the intent of the SMDWSP to reduce or diminish the flood protection LOS.

**WR-4 (continued)**

**Drainage System Threshold:**

**Table 6  
Miami-Dade County Drainage System Design Criteria**

<b>Type of Area</b>	<b>Design Return Period</b>	<b>Flood Limits</b>
Residential and Commercial areas (collector and local roads)	5-year	To crown of street or to within 15 feet of occupied building, whichever is lower
Two-lane roads in residential and commercial areas (collector and local roads)	5-year, except 10-year for a bridge or culvert in the canal system	To crown of street
Four-lane roads in high-density, high-traffic areas (minor arterial)	10-year	To outer edge of traffic lanes
Private parking lots and other similar paved areas	2-year	*(See South Florida Building Code 4611)

\* Replaced by public works manual.

The Miami-Dade County FPLOS criteria to be considered in the SMDWSP include canal flooding, structure flooding, and street flooding, and are summarized below.

1. All structures (commercial, residential, and public) should be flood-free during the 100-year flood.
2. Principal arterials including major evacuation routes should be passable during the 100-year storm.
3. Minor arterials (4-lane roads) should be passable during the 10-year flood.
4. Collector and local residential streets should be passable during the 5-year flood, as per current Miami-Dade County drainage policy.

The term “passable,” as used in these FPLOS goals, is defined by current Miami-Dade County drainage criteria. For principal arterials including evacuation routes, a roadway is considered passable if the depth of flooding does not exceed eight inches above the crown of the road during the 100-year storm. Minor arterial roads are considered passable if the depth of flooding does not exceed the outer edge of traffic lanes during a 10-year storm; and collector and local residential streets are considered passable if the depth of flooding does not exceed the crown of the road during the five-year storm.

<b>WR-4 (continued)</b>
<b>Threshold Justification:</b>
<p>The purpose of the FPLOS threshold is to provide a benchmark by which existing or future flood protection performance, within a given sub-basin, may be measured and compared to the performance within other sub-basins. Sub-basins or canal networks that do not meet the Miami-Dade County FPLOS criteria would be recommended for drainage system improvements.</p> <p>The adopted LOS is the threshold but a comparison will also be made to the current condition to determine net change associated with each scenario. An analysis of the net change between the current condition and each scenario, as well as the level of service is required because an increase in flooding does not necessarily indicate a problem. For example, twice as much water may be added to a canal in Scenario I, but the LOS may not be degraded therefore no mitigation is necessary.</p>
<b>Evaluation Method (Task 3):</b>
<p>The XPSWMM DERM Model will be utilized to simulate flooding conditions under the proposed 2025 and 2050 land use scenarios. The surface water elevations will be simulated for the baseline (existing) conditions and a comparative analysis will be completed for the three proposed land use scenarios.</p> <p>The level of flooding will be evaluated at the nodal level in the drainage system that is included in the XP-SWMM hydrologic model. The flood events to be modeled include the 5-Year, 10-Year, 25-Year, 50-Year, and 100-Year events. The nodes that are in exceedance of the baseline conditions will be evaluated against the Miami-Dade County Flood Protections Level of Service standards.</p>
<b>Source for Parameter:</b>
<ul style="list-style-type: none"> <li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003</li> <li>• Miami-Dade County Stormwater Management Master Plan</li> </ul>

### 3.2 Natural Communities

<b>Reference Number:</b>
NC-1 (Primary)
<b>Parameter:</b>
<i>Tidal Wetlands</i>
<b>Subject Area:</b>
Natural Communities
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 2. To identify and establish mechanisms for protecting constitutional private property rights of owners of land identified in 3(a) above. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long-term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
No net loss of native plant-dominated tidal wetland functions. (Comparative)
<b>Threshold Justification:</b>
Tidal wetlands are strategically important in the Watershed Study Area, both locally and in support of regional goals for hydroperiod restoration in South Florida. Tidal wetlands serve to filter pollutants from freshwater discharges before entering Biscayne Bay, recharge local aquifers, support fish and wildlife habitat and protect inland areas through attenuation of storm impacts. If this assessment identifies the need to acquire privately owned land to successfully implement the SMDWSP funding sources will be required to compensate land owners. Property owners will be afforded all rights to the approved use under the CDMP until the owner is compensated in accordance with law. Compensation includes but is not limited to land swaps and other forms of compensation.

**NC-1 (continued)****Evaluation Method (Task 3):**

Tidal wetlands were selected as a parameter because of their importance from a habitat and productivity perspective. Both spatial extent, hydrologic connectivity and native plant dominance are indicative of the overall health and quality of a wetland system. Hydrologic connectivity will be established through corridor analysis of the native plant-dominated tidal wetland database. For the purposes of this qualitative study, spatial extent and hydrologic connectivity of native plant-dominated wetlands are surrogates for a general assessment of wetland functions in the South Miami-Dade Watershed. The assessment of tidal wetlands will include the identification of tidal wetlands available for restoration.

Using Geographical Information System (GIS) analysis, the existing baseline condition for spatial extent and hydrologic connectivity of native plant-dominated tidal wetlands will be compared to future land use scenarios. Databases include the DERM (2003), FLUCCS (2000), and FNAI (2003).

**Source for Parameter:**

The following plans and studies support no net loss of native-dominated tidal wetland functions:  
Miami-Dade CDMP 2003, Conservation Element, Objective 7, 8, 9; USFWS South Florida Multi-Species Recovery Plan: Freshwater Marshes and Wet Prairies, Objective 1; Mangroves, Objective 1, 2; Coastal Salt Marsh, Objective 1, 2; CERP, BBCW Objective 4; C-111 Spreader Canal Project Objective 2; BBPI; NPS; Miami-Dade County ADID study.

<b>Reference Number:</b>
NC-2 (Primary)
<b>Parameter:</b>
<i>Transitional Wetlands</i>
<b>Subject Area:</b>
Natural Communities
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long-term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
No net loss of native plant-dominated transitional wetland functions. (Comparative)
<b>Threshold Justification:</b>
Transitional wetlands were selected as a parameter because of their importance in attenuating stormwater, filtering pollutants from stormwater discharges, recharging local aquifers, and supporting fish and wildlife habitat. Transitional wetlands, defined as wetland communities located within the zone of change between tidal and freshwater wetlands are important in the Watershed Study Area, both locally and in support of regional goals for hydroperiod restoration in South Florida. If this assessment identifies the need to acquire privately owned land to successfully implement the SMDWSP funding sources will be required to compensate land owners. Property owners will be afforded all rights to the approved use under the CDMP until the owner is compensated in accordance with law. Compensation includes but is not limited to land swaps and other forms of compensation.

<b>NC-2 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>The spatial extent, hydrologic connectivity and native plant dominance are indicative of the overall health and quality of a wetland system. Hydrologic connectivity will be established through corridor analysis of the native plant-dominated transitional wetland database. For the purposes of this qualitative study, spatial extent and hydrologic connectivity of native plant-dominated wetlands are surrogates for a general assessment of wetland functions in the South Miami-Dade Watershed.</p> <p>Using Geographical Information System (GIS) analysis, a comparison of the spatial extent and hydrologic connectivity of native plant-dominated transitional wetlands for the existing baseline condition and future land use scenarios will be performed using the DERM (2003), FLUCCS (2000), and FNAI (2003) databases.</p>
<b>Source for Parameter:</b>
<p>The following plans and studies support no net loss of transitional wetland functions:  Miami-Dade CDMP 2003, Conservation Element, Objective 7, 8, 9; USFWS South Florida Multi-Species Recovery Plan: Freshwater Marshes and Wet Prairies, Objective 1; CERP, BBCW Objective 4; C-111 Spreader Canal Project Objective 2; BBPI; NPS; Miami-Dade County.</p>

<b>Reference Number:</b>
NC-3 (Primary)
<b>Parameter:</b>
<i>Freshwater Wetlands</i>
<b>Subject Area:</b>
Natural Communities
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long-term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
No net loss of native-dominated freshwater wetland functions. (Comparative)
<b>Threshold Justification:</b>
Freshwater wetlands were selected as a parameter because of their importance in attenuating stormwater, filtering pollutants from stormwater discharges, recharging local aquifers, and supporting fish and wildlife habitat. Freshwater wetlands are important in the Watershed Study Area, both locally and in support of regional goals for hydroperiod restoration in South Florida. If this assessment identifies the need to acquire privately owned land to successfully implement the SMDWSP funding sources will be required to compensate land owners. Property owners will be afforded all rights to the approved use under the CDMP until the owner is compensated in accordance with law. Compensation includes but is not limited to land swaps and other forms of compensation.

<b>NC-3 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>The spatial extent, hydrologic connectivity and native plant dominance are indicative of the overall health and quality of a wetland system. Hydrologic connectivity will be established through corridor analysis of the native plant-dominated freshwater wetland database. For the purposes of this qualitative study, spatial extent and hydrologic connectivity of native plant-dominated wetlands are surrogates for a general assessment of wetland functions in the South Miami-Dade Watershed.</p> <p>Using Geographical Information System (GIS) analysis, a comparison of the spatial extent and hydrologic connectivity of native-dominated freshwater wetlands for the existing baseline condition and all land use scenarios will be performed using the DERM (2003), FLUCCS (2000), and FNAI (2003) databases.</p>
<b>Source for Parameter:</b>
<p>The following plans and studies support no net loss of freshwater wetland functions:</p> <p style="padding-left: 40px;">Miami-Dade CDMP 2003, Conservation Element, Objective 7, 8, 9; USFWS South Florida Multi-Species Recovery Plan: Freshwater Marshes and Wet Prairies, Objective 1; CERP, BBCW Objective 4; C-111 Spreader Canal Project Objective 2; BBPI; NPS; Miami-Dade County.</p>

<b>Reference Number:</b>
NC-4 (Primary)
<b>Parameter:</b>
<i>Remnant Natural Forests</i>
<b>Subject Area:</b>
Natural Communities
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long-term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
No net degradation of the remnant natural forest communities including consideration of adjacent land buffers. (Comparative)
<b>Threshold Justification:</b>
Remnant natural forest communities were selected as a parameter because of their importance from a habitat and landscape diversity perspective. Conservation of the remnant natural forest communities is vital to the protection and recovery of several threatened and endangered plant and animal species and their habitat. Without buffers, remnant natural forest communities would succumb to impacts from the surrounding land uses, and ultimately would become non-functional. The buffer and protection of natural systems is necessary to provide a transition between land uses. Buffers can decrease invasive exotic plant infestation, illegal dumping, and other impacts to intact natural communities from surrounding land uses. If this assessment identifies the need to acquire privately owned land to successfully implement the SMDWSP funding sources will be required to compensate land owners. If a buffer is designated around a remnant natural forest, the property owner will be afforded all rights to the approved use under the CDMP until the owner is compensated in accordance with law. Compensation includes but is not limited to land swaps and other forms of compensation.

<b>NC-4 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>No net degradation of remnant natural forest communities is dependent on protecting the existing spatial extent from loss due to development and the establishment of suitable land use within an adjacent lands buffer area. Adjacent lands buffer analysis will be determined using buffer distance proportional to the patch size of remnant natural forests. Conservation of the remnant natural forest communities would protect a majority of the Federal and State threatened and endangered species and their habitat within the South Miami-Dade Watershed.</p> <p>Using Geographical Information System (GIS) analysis, a comparison will be made of the existing spatial extent and buffer area surrounding remnant natural forests [USFWS (1994), DERM (2003), FLUCCS (2000), Florida Gap (1994), and FNAI (2003) databases] with areas available in future land use scenarios.</p>
<b>Source for Parameter:</b>
<p>The following plans and studies support no net loss of existing spatial extent of remnant natural forest and an increase in surrounding buffers:</p> <p style="padding-left: 40px;">Miami-Dade CDMP 2003, Conservation Element, Objective 7, 8; USFWS South Florida Multi-Species Recovery Plan: Tropical Hardwood Hammock, Objective 2, 3, 6; Pine Rocklands, Objective 1, 2, 3, 6; Mangroves, Objective 1, 2, 3, 4; Coastal Salt Marsh, Objective 3; CERP, BBPI; NPS; BBCW Objective 5.</p>

### 3.3 Land Use

<b>Reference Number:</b>
<b>LU-1 (Primary)</b>
<b>Parameter:</b>
<i>Development Patterns</i>
<b>Subject Area:</b>
Land Use/Community Character
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s)</b>
3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.

**LU-1 (continued)**

Acres of land in the Watershed Study Area planned for various development patterns, defined in four different categories: Urban, Suburban, Ex-urban and Rural.

An Urban development pattern can be generally described as having the following characteristics:

- a. Commercial land uses predominate in urban areas. 60% of land uses are commercial or mixed-use, with 25% of land in residential use. The remaining 15% of land is in recreational, industrial and other uses.
- b. A substantial amount of housing exhibits densities above 14 dwelling units per acre, with even greater numbers within ¼ mile of employment centers and transit stations. A density of 15 dwelling units per acre is necessary to support premium transit.
- c. Floor Area Ratio (F.A.R.) is above 1.0.
- d. Impervious surfaces are above 35% of urban areas.
- e. All of the urban areas are fully served by potable water and sewer utility services.
- f. The street network type is predominately a grid.
- g. At minimum of 10% of all trips made in urban areas are transit, pedestrian and bicycle trips.
- h. Buildings 2 stories and greater. Building heights average greater than 3 stories in the urban areas.

A Suburban development pattern can be generally described as having the following characteristics:

- a. Residential land uses predominate in suburban areas. 75% of land uses are residential, with 20% of land in commercial or mixed-use, and 5% in recreational, industrial and other uses.
- b. Housing density ranges from 1 to 14 dwelling units per acre.
- c. Average Floor Area Ratio is 1.0.
- d. Impervious surfaces are 10% to 35% of suburban areas.
- e. Suburban areas are served by potable water and sewer utility services.
- f. Suburban street network types are in grid and curvilinear patterns.
- g. Between 3% and 10% of all trips are transit, pedestrian and bicycle trips.
- h. Buildings are 1 to 4 stories tall in the suburban areas.

**LU-1 (continued)**

An Ex-urban development pattern can be generally described as having the following characteristics:

- a. In Ex-urban areas up to 50% of land is in agricultural use.
- b. Housing density is 1-10 acres per dwelling unit.
- c. Employment density is less than 1 employee per acre.
- d. Impervious surfaces are less than 10% of ex-urban areas.
- e. Ex-urban areas are sparsely served by potable water and sewer. Septic systems and wells are the primary type of wastewater treatment facility.
- f. Street network type - not applicable.
- g. Between 1% and 3% of all trips are transit, pedestrian and bicycle trips.
- h. Buildings are mostly 1 story in the ex-urban areas, with some 2-story buildings.

A Rural development pattern can be generally described as having the following characteristics:

- a. Rural areas are characterized by rural residential and agricultural and open land uses.
- b. Housing density is less than 1 dwelling unit per 10 acres.
- c. Employment density is less than 1 employee per acre.
- d. Impervious surfaces make up less than 1% of rural areas.
- e. Rural areas are not served by central water and sewer. Septic systems and wells are used instead.
- f. Street network type - not applicable.
- g. 100% of rural trips are by automobile.
- h. Buildings are 1 story tall in the rural areas.

**Threshold Justification:**

This parameter was selected because it is a measurable feature or representation of an area's land use or community character that can be applied in the context of a large-scale, long range planning effort such as this Study. By defining prototypical development patterns and attributes for four different categories and then comparing them with each scenario, a quantifiable and visual picture of the scenarios is generated. Various development patterns have discreet attributes that can be analyzed to evaluate land uses, infrastructure, economic conditions, impacts and urban form. This information will be used for a comparative and qualitative analysis and assessment of the land use scenarios.

**LU-1 (continued)****Evaluation Method (Task 3):**

The following steps will be taken to evaluate development patterns:

1. Define development patterns and attributes for each category (urban, suburban, ex-urban and rural). The development patterns will be defined as a composite of attributes typically based on a section scale. The attributes defined for each of the categories will include the following information:
  - a. Percentage of each major land use type;
  - b. Dwelling units per acre;
  - c. Floor Area Ratio (FAR);
  - d. Percentage of impervious surface;
  - e. Utility service;
  - f. Street network type (urban and suburban only);
  - g. Modes of transportation;
  - h. Building scale; and
  - i. Percentage of Public Parks (urban and suburban only).
2. Calculate the acres of development patterns and determine percentage of each category (Urban, Suburban, Ex-urban, and Rural) for each of the proposed land use scenarios;
3. Compare acreage, percentages and development patterns from each scenario to each other and to existing development patterns; and
4. Present results and a description of potential impacts to community character.

**Source for Parameter:**

- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003
- Palm Beach County Managed Growth Tier System adopted 1999.
- US EPA, Local Government Commission, and National Association of Realtors - Creating Great Neighborhoods: Density in Your Community, September 2003.
- US EPA and Criterion Planners/Engineers – Smart Growth INDEX User Guide, software.

<b>Reference Number:</b>
<b>LU-2 (Primary)</b>
<b>Parameter:</b>
<i>Agricultural and Rural Land</i>
<b>Subject Area:</b>
Land Use/Community Character
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 3. Economically diverse agriculture; 4. Healthy and sustainable Biscayne Bay and National Parks; 5. Open space, tourism and recreation; 6. Compatible enterprises; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
2. Identify and establish mechanisms for protecting constitutional private property rights. 3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
Acres of agricultural land and open land (open land as designated by the Miami-Dade County Adopted 2005 and 2015 Land Use Plan) outside existing urban development boundary (UDB).
<b>Threshold Justification:</b>
The encroachment of urban development on agricultural land and open land will affect rural community character. The conversion of rural land (agricultural land and open land outside existing UDB) to urban land may degrade the agricultural economy and rural character of the watershed. While limited development is currently allowed under the CDMP, the inclusion of agricultural land and open land in this parameter does not presume that these lands will be converted to urban uses.

<b>LU-2 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>The following steps will be taken to evaluate rural land:</p> <ol style="list-style-type: none"> <li>1. Calculate rural land outside the existing UDB;</li> <li>2. Delineate the existing rural lands into agricultural land and open land;</li> <li>3. Calculate the total acreage of rural land (agricultural and open land) designated for conversion in each scenario;</li> <li>4. Compare scenario acreages to the existing acreage; and</li> <li>5. Present results and a description of potential impacts to community character.</li> </ol> <p>The South Miami-Dade County economy, including the agricultural industry will be evaluated as part of parameter EC-1.</p>
<b>Source for Parameter:</b>
<ul style="list-style-type: none"> <li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003</li> <li>• Miami-Dade County Evaluation and Appraisal Report, October 2003</li> <li>• Notes from Technical Review Committee Meeting, November 6, 2003</li> </ul>

<b>Reference Number:</b>
<b>LU-3 (Primary)</b>
<b>Parameter:</b>
<i>Proximity of Land Uses (Housing and Employment) to Transit</i>
<b>Subject Area:</b>
Land Use/Community Character
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
Resident and workforce population within ½ mile of premium transit (comparative) and high capacity transit corridors. According to the <i>Strategic Regional Policy Plan for South Florida (SRPP)</i> the following are examples of Premium Transit Service: <ul style="list-style-type: none"> <li>• Provides a high-quality transit experience with frequent headways;</li> <li>• Are utilized by both local service and express service;</li> <li>• Local service stops at all transit villages;</li> <li>• Include express service stops only at intermodal centers;</li> <li>• Allow express buses to change traffic signals from red to green;</li> <li>• Provide an opportunity to link regional centers with a seamless transit network;</li> <li>• Complement rather than compete with Tri-Rail; and</li> <li>• The Dixie Highway Corridor may or may not utilize existing FEC tracks or rights-of way.</li> </ul>
<b>Threshold Justification:</b>
Proximity of land uses to transit was selected as a parameter because it is measurable and is an important indicator of community character. In addition, this parameter is an indicator of the cost of roadways versus mass transit infrastructure. Mixed-use development and multimodal transportation systems support urban land development patterns that promote efficient use of land, infrastructure and resources, as well as economic opportunities and community character.

<b>LU-3 (continued)</b>
<b>Evaluation Method (Task 3):</b>
Using GIS analysis to represent the existing and future mass transit system (according to the 2003 CDMP and 2003 EAR), the existing land uses and the land use scenarios, resident and workforce population within proximity of transit stations and corridors will be calculated and illustrated. Planned expansions to the mass transit system will be taken into account based on emerging Miami-Dade and regional transit plans. A comparative analysis correlating land uses, resident/workforce population and premium transit and high capacity transit corridors that may include estimates of ridership and transit trip capture.
<b>Source for Parameter:</b>
<ul style="list-style-type: none"> <li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003</li> <li>• Miami-Dade County Evaluation and Appraisal Report, October 2003</li> </ul>

<b>Reference Number:</b>
<b>LU-4 (Primary)</b>
<b>Parameter:</b>
<i>Parks and Recreation Land</i>
<b>Subject Area:</b>
Land Use/Community Character
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 2. Honor private property rights; 5. Open space, tourism and recreation; 7. Historic quality, rural character and community.
<b>Land Use Policy 3E Objective(s):</b>
3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
A minimum threshold of 2.75 acres of local recreation open space per 1,000 permanent residents.

**LU-4 (continued)****Threshold Justification:**

The minimum threshold of 2.75 acres per 1,000 permanent residents is consistent with the level of service standard contained in the Recreation and Open Space and Capital Improvements Elements of the CDMP. Objective 2, Policies 2A and 2B of the Recreation and Open Space Element of the CDMP requires the availability of adequate local recreation open space as a condition for the approval of residential development orders. Inside the UDB, the CDMP requires a minimum of 2.75 acres of local recreational open space per 1,000 permanent residents and residents should not be located more than 3.5 miles away from a park of greater than five acres in size. Every municipality in the Watershed Study Area has a similar policy in their comprehensive plan. The average of acreage of parks required by municipalities in the Watershed Study Area is 2.79 acres of parks per 1,000 residents. Table 7 describes the required levels of service for parks and recreation space for municipalities within the Watershed Study Area.

**Table 7  
Parks and Recreation Requirements**

Municipality	Adopted Level of Service Standard (park acreage per 1000 residents)
Miami-Dade County	2.75
Coral Gables	3.00
South Miami	4.00
West Miami	2.00
Pinecrest	2.00
Florida City	2.75
Homestead	3.00
<b>AVERAGE</b>	<b>2.79</b>

Source: Adopted comprehensive plans for Miami-Dade County, Coral Gables, South Miami, Pinecrest, Florida City and Homestead.

As defined in the Recreation and Open Space Element of the CDMP, recreation and open space counted when measuring level of service shall include: 1) public local parks which exist or are committed by covenant; 2) public school and college playfields; 3) portions of private recreation open space; and County-owned or operated parks that have been incorporated or annexed into municipalities but in which the majority of park program participants are unincorporated area residents.

<b>LU-4 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>The following steps will be taken to evaluate parks and recreation land:</p> <ol style="list-style-type: none"> <li>1. Calculate the required park space for the projected population in the years 2025 and 2050 and</li> <li>2. Compare the 2025 and 2050 population level of service against the threshold of 2.75 acres per 1,000 permanent residents.</li> </ol>
<b>Source for Parameter:</b>
<ul style="list-style-type: none"> <li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003.</li> <li>• Broward County Comprehensive Plan, as amended through February 2002. Recreation and Open Space Element.</li> <li>• Trust for Public Land – Why America Needs More City Parks and Open Space, 2003. <a href="http://www.tpl.org">www.tpl.org</a>.</li> </ul>

### 3.4 Economic Conditions

<b>Reference Number:</b>
<b>EC-1 (Primary)</b>
<b>Parameter:</b>
<i>Economic Base (Distribution of Employment by Industry and Acreage)</i>
<b>Subject Area:</b>
<b>Economic Conditions</b>
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 3. Economically diverse agriculture; 5. Open space, tourism and recreation; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
<ol style="list-style-type: none"> <li>1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park.</li> <li>2. To identify and establish mechanisms for protecting constitutional private property rights of owners of land identified in 3(a) above;</li> <li>3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area.</li> <li>4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.</li> </ol>

**EC-1 (continued)**

**Threshold:**

The correlation between economic sectors (by industry) and employment will be compared between scenarios and against current levels. Comparisons between the Watershed Study Area and Miami-Dade County will also be conducted. A sample of economic base sectors is shown in Table 8.

**Table 8  
Economic Base Industries**

<b>Industry*</b>
Agriculture, forestry, fishing and hunting and mining
Construction
Manufacturing
Wholesale trade
Retail trade
Transportation and warehousing and utilities
Information
Finance, insurance, real estate and rental and leasing
Professional, scientific, management, administrative, and waste management services
Educational, health and social services
Arts, entertainment, recreation, tourism, accommodation and food services
Other services (except public administration)
Public Administration

\* Industry categories derived from the U.S. Census.

**EC-1 (continued)**

**Threshold Justification:**

The economic base of the Watershed (i.e. business establishments, types of jobs, their distribution, and quality) determines the standard of living and opportunities for households within the Watershed. A region's economic sustainability depends on the types of industries, employers and job opportunities that are supporting households in the area.

The ability of a region to weather or sustain economic downturns (business cycle recessions and decelerations in economic activity) depends on the types of industries and job opportunities that are supporting the region. A diversified economic base is one that is not overly dependent on any one sector. Industries that are pro-cyclical tend to be correlated or linked tightly to national economic trends and downturns. However, some industries grow in a manner that is called counter-cyclical (i.e. inversely with the overall business cycle) and these sectors offer greater opportunities for sustainable economic growth in a region. Simply put, a region that does not have all of its eggs in one basket but is characterized by a diverse group of industry sectors and employers tends to grow at more sustainable rates and provide a more diverse array of opportunities for residents. These regions tend to have more stable and sustainable tax bases that support public functions that make for a well-rounded community.

A diversified economic base provides sustainable economic growth opportunities for Watershed residents and the ability to weather economic downturns. A diversified employment base requires a mix of industries and jobs that insulate the region as a whole from external shocks to any one sector.

While land use and economic development strategies can contribute towards attaining such a base, macroeconomic and other factors (natural endowments of land, labor, capital and ecological systems) largely determine the mix of business establishments, industries and employment opportunities within the Watershed Study Area.

Within the Watershed Study Area, land use decisions can affect how the structure of the economy will appear in the future. However, these decisions cannot influence the entire economic base. Setting a threshold concerning the types of employment distribution and how the economic base (breakdown of employment by industry sector) will appear in the future is not a task that is within the purview of land-use planning. Identifying factors that can influence the economic base that are within the control of stakeholders is a planning area that requires input from key stakeholders and interest groups.

## **EC-1 (continued)**

### **Evaluation Method (Task 3):**

The following steps were taken to define the baseline employment situation and structure.

1. The baseline economic base was measured by evaluating distribution of employment by industry and occupation. Since a measurement of Watershed Study Area Gross Domestic Product is not available, employment was used as a proxy measure;
2. The baseline economic base is compared and contrasted to Miami-Dade County to highlight key differences and industry mixes.
3. Growth in key sectors is measured by evaluating County level data by industry (for the same industry sector) because time series employment characteristics are not available for the Watershed Study Area (below the County level).
4. Growth in key sectors is then compared to key sectors identified in economic development plans and strategies.

### Defining the Future Employment Situation and Structure

The Watershed Study includes an economic modeling task that is important in understanding future economic growth, jobs and incomes that will be available to support households. The economic modeling task will provide an indication of how proposed broad qualitative targets or thresholds will be met in the future. At this point in the Study we only know the current baseline economic base or employment distribution for Watershed Study Area residents. We do not know how the economy will evolve over time but we can simulate this growth with an economic model and reasonable assumptions.

### Challenges Identified in Meeting Thresholds

The Study can propose thresholds based on achieving a balanced economic plan. However, it should be noted that the ability of the community to achieve these thresholds depends on numerous macroeconomic forces, some of which are outside the control of local policymakers and /or land use planning techniques. For example, the distribution of factor endowments that determine economic output is influenced by physical location, interest rates and supply and demand conditions based on market signals. These macroeconomic forces are beyond the control of local public policymakers.

Furthermore, the complex population dynamics that characterize the Watershed Study Area poses an added challenge in that a large portion of the annual increase to the population base is determined by net migration from outside the U.S. The characteristics of these populations (age, education, wealth etc.) will also influence the structure of the economy and growth trajectory within the Watershed Study Area.

**EC-1 (continued)****Source for Parameter:**

- U.S Census Bureau - Census 2000, P43 Sex by employment status for the population 16 years and over - Census 2000 Summary File 3 (SF 3) - Sample Data
- Source: U.S. Census Bureau - Census 2000 - Summary File 3 (SF 3) - Sample Data, P50, Sex by occupation for the employed civilian population 16 years and over
- U.S. Census 2000, P49 Sex by industry for the employed civilian population 16 years and over Census 2000 Summary File (SF3) Sample Data
- Agency for Workforce Innovation, Nonagricultural Employment for the Most Recent 12 Months and Historical Employment by Industry, <http://www.labormarketinfo.com/ces/ces.htm>
- Insight 2004, A Review and Forecast of the Miami-Dade Economy-A Beacon Council / South Florida CEO Report, January 2004.
- Economic Element (Proposed) CDMP Year 2005-2015, Miami-Dade County Florida, February 2002
- Miami-Dade County Evaluation and Appraisal Report (EAR), October 2003

### 3.5 Infrastructure

<b>Reference Number:</b>			
<b>IS-1 (Primary)</b>			
<b>Parameter:</b>			
<i>Transportation</i>			
<b>Subject Area:</b>			
Infrastructure			
<b>WSAC Goal(s):</b>			
1. Vibrant and sustainable communities; 6. Compatible enterprises; 7. Historic quality, rural character and community.			
<b>Land Use Policy 3E Objective(s):</b>			
4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.			
<b>Threshold:</b>			
The threshold for transportation facilities is the adopted Miami-Dade County Peak Period Level of Service (LOS) Standards for roadways, which is described below. As shown in Tables 9 and 10, the LOS standard varies based on location and the level of transit service.			
<b>Table 9</b>			
<b>Roadways Not Designated as Florida Intrastate Highway System Roadways</b>			
Location	<b>Transit</b>		
	No Transit Service	20 Min. Headway Transit Service Within ½ Mile	Extraordinary Transit Service (Commuter Rail or Express Bus)
	<b>Arterial Network</b>		
Outside UDB	LOS D – State Minor Arterials LOS C – County Roads and State Principal Arterials		
Between UIA and UDB	LOS D (90% of Capacity); or LOS E on SUMAs* (100% Capacity)	LOS E (100% of Capacity)	120% of Capacity
Inside UIA	LOS E (100% Capacity)	120% of Capacity	150% of Capacity

**IS-1 (continued)**

**Table 10**  
**Intrastate Highway System Roadways**

Location			Roadways Parallel to Exclusive Transit Facilities	Inside Transportation Concurrency Management Areas	Constrained or Backlogged Roadways
FIHS Facility	Outside UDB	Inside UDB			
Limited Access Facilities	B	D [E]	D [E]	D [E]	Manage
Controlled Access Facilities	B	D [E]	E	E	Manage

**NOTES:**

LOS inside of [brackets] applies to general use lanes only when exclusive thru lanes exist.

UIA = Urban Infill Area – Area east, and including NW/SW 77 Avenue and SR 826 (Palmetto Expressway), excluding the City of Islandia and excluding the area north of SR 826 and west of I-95.

UDB = Urban Development Boundary

SUMA = State Urban Minor Arterial

\* Peak-period means the average of the two highest consecutive hours of traffic volume during a weekday.

**Threshold Justification:**

The level of service standards above have been approved by the Miami-Dade County Board of County Commissioners and is adopted as part of the Comprehensive Development Master Plan, May 1997, as amended through April 2003.

<b>IS-1 (continued)</b>
<b>Evaluation Method (Task 3):</b>
<p>The 2025 Florida Standard Urban Transportation Model Structure (FSUTMS) Miami Urban Area Transportation Model will be utilized to assess traffic conditions under the proposed 2025 and 2050 land use scenarios. The population levels of the model will be adjusted to reflect the new levels projected by the Watershed Study. Based on the characteristics of each scenario some model adjustments may be made to incorporate transit. Transit split will be estimated for each scenario. Other factors relative to transportation such as pedestrian access, bicycle lanes and TDM (Transportation Demand Management) strategies will be addressed as part of the alternative actions analysis (Sub-task 4.2).</p> <p>The adopted LOS is the threshold but a comparison will also be made to the current condition to determine net change associated with each scenario. An analysis of the net change between the current condition and each scenario, as well as the level of service is required because an increase in traffic does not necessarily mean there is a problem. For example, twice as much traffic may be added to a roadway from scenario 1 but the LOS may not be degraded therefore no mitigation is necessary.</p> <p>The consequences of exceeding the adopted LOS will be compared between scenarios. Potential consequences may include increased vehicle miles traveled, increased commute times and new lane miles.</p>
<b>Source for Parameter:</b>
Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003

<b>Reference Number:</b>
IS-2 (Primary)
<b>Parameter:</b>
<i>Schools</i>
<b>Subject Area:</b>
Infrastructure
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
While not an adopted level of service standard, 115% of Florida Inventory of School Houses (FISH) Capacity will be used to assess the impact of the land use scenarios on schools. A cost comparison of additional school requirements will also be calculated for each scenario.

<b>IS-2 (continued)</b>
<b>Threshold Justification:</b>
115% of Florida Inventory of School Houses (FISH) Capacity is the public school capacity included in the Interlocal Agreement between Miami-Dade County, the Cities of Miami-Dade County and the Miami-Dade County School Board for Public School Facility Planning.
<b>Evaluation Method (Task 3):</b>
<p>The following steps will be taken to evaluate school capacity:</p> <ol style="list-style-type: none"> <li>1. Calculate total school capacity for elementary, middle and/or high school (existing and planned capacity) according to FISH capacity;</li> <li>2. Calculate total student population in 2025 and 2050 at the elementary, middle and/or high school level (add additional students resulting from land use scenarios to existing enrollment);</li> <li>3. Compare total capacity and total students;</li> <li>4. Identify total elementary, middle and/or high school student demands that exceed 115% of the FISH capacity; and</li> <li>5. Calculate and compare the costs associated with providing schools under each scenario.</li> </ol> <p>The total number of students resulting from each of the land use scenarios will be same.</p> <p>School capacity will be calculated based on the capacity of all elementary, middle and high schools in the Watershed Study Area. New students will not be distributed to specific schools. Capacity shortfalls will be determined at the elementary, middle and high school level.</p> <p>The consequences of exceeding the FISH capacity will be compared between scenarios. Potential countermeasures may include additional land area and costs for constructing schools.</p>
<b>Source for Parameter:</b>
<ul style="list-style-type: none"> <li>• Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003</li> <li>• Interlocal Agreement between Miami-Dade County, the Cities of Miami-Dade County and the Miami-Dade County School Board for Public School Facility Planning</li> </ul>

## 4.0 SECONDARY PARAMETERS

### 4.1 Water Resources

No secondary water resources parameters.

### 4.2 Natural Communities

No secondary natural communities parameters.

### 4.3 Land Use

No secondary land use parameters.

### 4.4 Economic Conditions

<b>Reference Number:</b>
EC-2 (Secondary)
<b>Parameter:</b>
<i>Cost of Housing</i>
<b>Subject Area:</b>
Economic Conditions
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 3. Economically diverse agriculture; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
Comparison of the cost of housing portrayed under baseline to projected cost of housing for each land use scenario

**EC-2 (continued)**

**Threshold Justification:**

The housing costs resulting from each scenario will be compared to determine which scenario provides more opportunities for affordable housing. This parameter will be considered in conjunction with EE-4 (Household Income and Wages).

Housing costs can be defined in terms of standard monthly cost burdens (mortgage payments, rents). Thresholds can be defined in terms of household incomes relating to very low (below poverty line), low, medium/moderate and high incomes. Some of the thresholds are established by federal housing assistance programs based on the particular income group.

However, on average, across all households within the Watershed Study Area, a sustainable economy should result in households that move into higher income groups over time in a progressive manner. With land and housing scarcity issues, housing costs may also rise as urban infill occurs.

Parameters EC-2 and EC-3 will be analyzed together to determine potential affordable housing impacts to all levels of income, including farm workers.

**Evaluation Method (Task 3):**

Importance of Economic Modeling in Evaluating Parameters and Thresholds

At this point in the Study we do not know with any certainty how the housing market will evolve over time, nor do we know how much household incomes will continue to grow in the future. The economic modeling task will provide an indication of housing costs.

Measuring the Baseline and Identifying Relevant Trends

The threshold is evaluated by first examining socioeconomic characteristics that define Watershed Study Area households from all walks of life. Detailed Census 2000 tract level data is compiled and evaluated. The Watershed Study Area, defined as a discrete group of census tracts (119) is segregated for analysis. The Watershed Study Area is defined according to household income and housing characteristics (living arrangements) and compared to countywide averages. Evaluation of the baseline situation is necessary to also understand where various households and their differing respective living arrangements (density) are physically situated vis a vis the Watershed's drainage basins (Canal basins) and current zoning patterns.

**EC-2 (continued)****Source for Parameter:**

- Miami-Dade County Evaluation and Appraisal Report (EAR), October 2003 -(esp. Growth Impacts and Affordable Housing Section)
- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003
- Economic Element (Proposed) of CDMP, February 2002
- U.S. Census Bureau, Census 2000, Source: U.S. Census Bureau, Census 2000, H97 Household Income in 1999 by selected monthly owner costs as a percentage of household income in 1999, Summary File 3 (SF3) - Sample Data datasets
- U.S. Department of Housing and Urban Development;
- Shimberg Center for Affordable Housing - University of Florida, <http://www.shimberg.ufl.edu/>; University of Florida, The State of Florida's Housing, 2000
- "Inclusionary Housing: A Discussion of the Policy Issue, Prepared for Alachua County Department of Planning & Development, Gainesville, Florida, Anne Ray MUPP, June 15, 2001

<b>Reference Number:</b>
<b>EC-3 (Secondary)</b>
<b>Parameter:</b>
<i>Household and Per Capita Income and Wages</i>
<b>Subject Area:</b>
Economic Conditions
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 3. Economically diverse agriculture; 5. Open space, tourism and recreation; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
<ol style="list-style-type: none"> <li>1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park.</li> <li>3. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area.</li> <li>4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.</li> </ol>
<b>Threshold:</b>
Comparison of baseline median household incomes to projected incomes generated by each land use scenario
<b>Threshold Justification:</b>
<p>Household incomes, wages, and poverty issues are important socio-economic characteristics that define the Watershed Study Area. Wages are the main source of household incomes. Wages provide a measure of household or consumer purchasing power and comparisons between regions and industries reveal the quality of jobs available to sustain the populace. Wages, together with jobs and household incomes describe the baseline economic base of the Watershed. Household incomes are the fabric that supports a viable, balanced economy.</p> <p>Within the Watershed Study Area, land use decisions can affect how the structure of the economy will appear in the future. These decisions cannot influence the entire economic base however. Setting a threshold concerning the level of household incomes and how their distributions will appear in the future is not a task that is within the purview of land-use planning. Identifying factors that can influence incomes that are within the control of stakeholders and policymakers is a planning area that should require inputs from key stakeholders and interest groups.</p>

**EC-3 (continued)****Evaluation Method (Task 3):**

The following steps will be taken to evaluate household income and wages baselines:

1. Income data is evaluated for Watershed Study Area residents at the census tract and basin level and compared to Miami-Dade County as a whole. Lower income areas will be identified and flagged for future reference;
2. A measure of income inequality will be constructed for both the Watershed Study Area and Miami-Dade County; and
3. A special Agency for Workforce Innovation (ES-202) dataset containing average wages by census block and trips by workers to those blocks within Miami-Dade County will be reviewed at the tract and basin level.

**Source for Parameter:**

- Source: Census 2000 Summary File 3 (SF 3) - Sample Data, P90 Status in 1999 of Families by Family Type by Presence of Related Children Under 18 Years of Age
- Census 2000 Summary File (SF3) Sample Data, P53 Median Household Income in 1999, P82 Per Capita Income in 1999
- Technical Paper No. TP-2003-07, "Origin Destination Matrix and Block Characteristics Files: Prototypes developed for the Bureau of Transportation Statistics," U.S. Census Bureau Longitudinal Employer Household Dynamics Program (LEHD)
- Proposed Economic Element
- Miami-Dade County Evaluation and Appraisal Report, October 2003

## 4.5 Infrastructure

<b>Reference Number:</b>
<b>IS-3 (Secondary)</b>
<b>Parameter:</b>
<i>Potable Water (Water Treatment Plant Capacity and Service Areas)</i>
<b>Subject Area:</b>
Infrastructure
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 4. Healthy and sustainable Biscayne Bay and National Parks; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
The threshold for potable water is the system-wide water treatment plant capacity of 563.03 Million Gallons per Day (MGD) and a comparison of distribution expansion costs associated with each scenario. Plant capacity includes existing capacity and planned improvements through the year 2020.
<b>Justification for Threshold:</b>
<p>The potable water transmission systems for the Miami-Dade County's water treatment plants are interconnected making it impossible to identify a plant that treats only water serving the Watershed. Table 2.5.1-3 of the Evaluation and Appraisal Report adopted in October 2003 (EAR) describes the total Maximum Day Capacity for all water treatment plants through the year 2020 as 563.03 MGD. The threshold capacity for potable water supply projections for the years 2025 and 2050 will be based on the 2020 capacity (563.03 MGD) because it includes current capacity and planned improvements. The projections used in Table 2.5.1-3 include two new treatment plants, one in South Miami-Dade and one in the Northwest Wellfield Area. They exclude Florida City and Homestead, as these municipalities have their own water treatment facilities. The total treatment capacity for the City of Homestead is 17 MGD. Florida City draws its water from four wells with a total capacity of 4.1 MGD.</p> <p>This parameter also will address the impact of new service areas and adding potable water distribution systems to existing areas not having service. This is an important infrastructure cost element that is affected by land use patterns.</p>

**IS-3 (continued)****Evaluation Method (Task 3):**

Miami-Dade Water and Sewer Department estimates the average per capita demand per day at 169 gallons. The per capita demand rate is based on data in Table 2.5.1-2 of the EAR and recommendations from the Miami-Dade County Water and Sewer Department staff. The per capita demand will be utilized with population projections to calculate system demands for the years 2025 and 2050. The results will be compared to the system-wide capacity. Countywide population figures will be used to calculate system-wide demand. Due to the fact that the water treatment system is interconnected and water can be treated at any County facility, there is no way to determine exactly where the Watershed populations' potable water is treated. Impacts on potable water created by the Watershed's population will be calculated based on the percentage of the Watershed population to the Countywide population.

As required by their respective comprehensive plans, the formula to calculate per capita demand in Homestead and Florida City will use a demand rate of 275 gallons per capita per day. The populations of Homestead and Florida City will be delineated and compared to capacity rates described above. The functional population of the Florida Keys (defined in the Sub-task 1.2: Population Growth Final Work Product) will also be considered in the demand calculations.

Opportunities for water conservation will be identified and may be used to reduce the per capita demand rates described above.

The consequences of exceeding plant capacity will be compared between scenarios. Potential consequences may include additional distribution facilities and new treatment plants.

**Source for Parameter:**

- Miami-Dade County Evaluation and Appraisal Report, October 2003
- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003
- Miami-Dade Water and Sewer Department, December 2003
- Florida City Evaluation and Appraisal Report, March 1996
- City of Homestead Comprehensive Plan, April 2001

<b>Reference Number:</b>
<b>IS-4 (Secondary)</b>
<b>Parameter:</b>
<i>Wastewater (Wastewater Treatment Plant Capacity and Service Areas)</i>
<b>Subject Area:</b>
Infrastructure
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 4. Healthy and sustainable Biscayne Bay and National Parks; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
The threshold for wastewater is the system-wide wastewater treatment capacity of 414.25 MGD and a comparison of collection expansion costs associated with each scenario. Plant capacity includes existing capacity and planned improvements through the year 2020.
<b>Threshold Justification:</b>
Objective 2 of the Water and Sewer Sub-element of the CDMP provides that the County will maintain procedures to ensure that adequate wastewater facility capacity will be available to meet future needs. MDWASD provides sewer service to most of Miami-Dade County. This parameter also will address the impact of new service areas and adding wastewater collection systems to existing areas not having service. This is an important infrastructure cost element that is affected by land use patterns.

**IS-4 (continued)****Evaluation Method (Task 3):**

Miami-Dade County per capita demand for wastewater treatment is 125 gallons per day. This number will be utilized with population projections to calculate system demands for the years 2025 and 2050. The results will be compared to the system-wide capacity of 414.25 MGD. Countywide population figures will be established to calculate system-wide demand. Impacts on wastewater treatment capacity needs created by the Watershed's projected population will be calculated based on the percentage of Watershed population to the Countywide population.

The wastewater transmission systems for the Miami-Dade County's wastewater treatment plants are interconnected making it impossible to identify a plant that treats only wastewater originating from the Watershed. The interconnectedness of the plants provides MDWASD with the capability to direct sewage flows between service areas from one plant to another. Table 11 describes individual plant capacity and the countywide total. The City of Homestead provides its own wastewater treatment services. The City's capacity for wastewater treatment is six mgd.

**Table 11**

<b>Wastewater Treatment Plant</b>	<b>Annual Average Flow Rated Capacity (MGD)</b>
North Dade Wastewater Treatment Plant	120
Central Dade Wastewater Treatment Plant	143
South Dade Wastewater Treatment Plant	131.25
New Wastewater Treatment Plant at Bird Drive Basin	20
<b>TOTAL CAPACITY</b>	<b>414.25</b>

Source: Table 1-2 and Section 1.9.1 of the MDWASD Wastewater Facilities Master Plan, June 2003

The consequences of exceeding plant capacity and for providing new and expanded collection systems will be compared between scenarios. Potential consequences may include additional collection facilities and new treatment plants.

**Source for Parameter:**

- Miami-Dade County Comprehensive Development Master Plan, May 1997, as amended through April 2003
- MDWASD Wastewater Facilities Master Plan, June 2003

<b>Reference Number:</b>
<b>IS-5 (Secondary)</b>
<b>Parameter:</b>
<i>Air Quality (Vehicle Emissions)</i>
<b>Subject Area:</b>
Infrastructure
<b>WSAC Goal(s):</b>
1. Vibrant and sustainable communities; 4. Healthy and sustainable Biscayne Bay and National Parks; 6. Compatible enterprises.
<b>Land Use Policy 3E Objective(s):</b>
1. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park. 4. Assure compatible land uses and zoning decisions in the Watershed Study Area consistent with long term objectives for a sustainable South Miami-Dade.
<b>Threshold:</b>
<p><b><u>Air Quality Threshold</u></b></p> <p>    Volatile Organic Compounds (VOC) - 148.77 Tons Per Day      Oxides of Nitrogen (NOx) - 111.82 Tons Per Day</p> <p>The current State Implementation Plan (SIP) agreed to by the Florida Department of Environmental Protection (FDEP) and the U.S. Environmental Protection Agency (EPA) specifies vehicle emissions budgets for VOC and NOx. The SIP is an air quality agreement between the FDEP and U.S. EPA. The VOC and NOx budgets provide a safety margin for transportation planning authorities to show conformity with the SIP. VOC and NOx serve as indicators of total emissions, including ozone. Ozone is formed when precursor compounds from vehicle emissions react with sunlight.</p>
<b>Threshold Justification:</b>
<p>This parameter is selected as an infrastructure parameter because it is directly affected by vehicle emissions which will vary for each scenario.</p> <p>The legal authority under federal law is The Clean Air Act. The legal authority under State law to administer all of the provisions of the SIP is included in Chapter 403, Florida Statutes, Environmental Control Part I and Part V.</p>

<b>IS-5 (continued)</b>
<b>Evaluation Method (Task 3):</b>
The MOBILE6 computer program will be used to evaluate levels of VOC and NOx. MOBILE6 will estimate emission factors for any year between 1952 and 2050. Vehicles from the 25 most recent model years are included in the analysis. Emission factor estimates such as altitude, ambient temperature and travel speeds can be specified by the user.
<b>Source for Parameter:</b>
State of Florida State Air Implementation Plan (SIP), 2005 Emissions Budget

## 5.0 CONCLUSION

Understanding fully how future land use scenarios perform against Land Use Policy 3E and the WSAC goals is integral to the success of the SMDWSP, including the selection of a preferred scenario. Specifically, the final parameters and thresholds will form the basis of measurement for performance of such scenarios in Task 3 of the SMDWSP.

Keith and Schnars has reviewed the relevant references from Sub-tasks 1.1 to 1.7, consulted academic experts and met with the PMT, Miami-Dade County staff, WSAC and the TRC to discuss the development of parameters and thresholds. Based on this review and coordination, along with input from the K&S's experts, the 20 parameters and associated thresholds presented herein have been developed.

The parameters and thresholds reflect the importance of the WSAC goals and a clear understanding that preserving community character and an environmentally and economically sustainable South Miami-Dade County, including protecting Biscayne Bay, is the purpose of the SMDWSP. The scientific measures described in this report and stakeholder input on subjective issues such as, the public's perception on development densities and urban design standards, will serve as guides for developing a successful SMDWSP.

# Appendix A

## **SOUTH MIAMI DADE WATERSHED STUDY VISION AND GOALS WATERSHED STUDY ADVISORY COMMITTEE**

### **Watershed Study Advisory Committee's Vision Statement**

“The South Miami-Dade Watershed Study Area is composed of vibrant communities with strong identities established on foundations that are economically, socially and environmentally sustainable, which honor private property rights. It supports economically viable and diverse agriculture; ensures a healthy and sustainable south Biscayne Bay and Biscayne and Everglades National Parks; and promotes open space and tourism and recreational facilities based on its natural wonders while welcoming other compatible enterprises. Sustainable urban development preserves historic quality and rural character with a strong sense of local community and stewardship.”

– This vision statement was created by the Watershed Study Advisory Committee.

### **Watershed Study Advisory Committee's Goals**

The goals adopted by consensus by the Watershed Study Advisory Committee are identified for reference below.

*Goal 1: Create and maintain vibrant communities with strong identities that achieve environmental, economic and social sustainability.*

*Goal 2: Honor private property rights*

*Goal 3: Support economically diverse agriculture*

*Goal 4: Ensure a healthy and sustainable Biscayne Bay and Biscayne and Everglades National Parks.*

*Goal 5: Promote open space and tourism and recreational facilities based on natural wonders.*

*Goal 6: Welcome other compatible enterprises.*

*Goal 7: Preserve historic quality and rural character with a strong sense of local community and stewardship*

**Miami-Dade County Comprehensive Development Master Plan, May 1997, as  
amended through April 2003  
Land Use Objective 3 and Land Use Policy 3E**

**Objective 3**

Upon the adoption of the CDMP, the location, design and management practices of development and redevelopment in Miami-Dade County shall ensure the protection of natural resources and systems by recognizing, and sensitively responding to constraints posed by soil conditions, topography, water table level, vegetation type, wildlife habitat, and hurricane and other flood hazards, and by reflecting the management policies contained in resource planning and management plans prepared pursuant to Chapter 380, Florida Statutes, and approved by the Governor and Cabinet.

**Policy 3E**

1. By January 1, 2002, Miami-Dade County shall develop and initiate implementation of an integrated land use and water management plan for southeastern Miami-Dade County, based on a Comprehensive Study (the "Study") as described below. The January 1, 2002, date may be extended as necessary by a subsequent CDMP amendment filed by the County. The Plan will direct the comprehensive management of land uses and surface and ground water, its quality, quantity, timing, and distribution. The plan will have two time horizons: 1) a short-term component extending through the year 2015, and 2) a long-term component extending through the year 2050. The overall goal of the plan will be to optimize the economic, social, and environmental values currently recognized in the County's Comprehensive Development Master Plan in the study area from the C-2 canal basin south to U.S. Highway 1 as a primary emphasis, and the C-3 to C-2 canal basins as a secondary area.

2. This plan and study, to be known collectively as the South Dade Land Use and Water Management Plan (the "Plan"), will be prepared by an impartial person or entity approved by the Board. The selection process will include representatives from the Biscayne National Park Buffer "Land Bank Trust" Working Group (the "Working Group") on the selection committee. The Working Group will review and make recommendations regarding the final RFP.

3. The Plan must fulfill the following specific objectives:

- a) To identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park;
- b) To identify and establish mechanisms for protecting constitutional private property rights of owners of land identified in 3(a) above;
- c) To support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area; and

- d) To assure compatible land uses and zoning decisions in the Study Area are consistent with long-term objectives for a sustainable South Miami-Dade.

4. The Study must project, examine, and analyze surface- and groundwater uses and corresponding land uses, including water uses for sustaining and restoring the environment, sustaining economically viable agriculture, providing flood protection, supplying and protecting drinking water, and other water uses pertinent to probable land uses. The Study must provide data and analysis necessary to thoroughly support the South Dade Land Use and Water Management Plan. The Study must include an examination and analysis of:

- a) Examples and models of mechanisms of conservation;
- b) All relevant studies pertaining to the Study Area;
- c) Property rights of landowners as they relate to objectives of the plan;
- d) Existing and needed numeric standards for quality, quantity, timing and distribution of waters into and of Biscayne National Park;
- e) Existing and needed studies of freshwater and groundwater supply;
- f) Methods and policies for best management practices of all sources of water runoff and levels of service for flood control in the Study Area;
- g) Socioeconomic factors for optimization of the objectives to the Plan; and
- h) Ways to integrate the Plan into the Central and Southern Florida Restudy.

5. It is recognized that the subject Plan will provide extensive information that will greatly assist in the consideration of proposed new development in the Study Area.

Until the plan is approved, the Board shall appoint a review committee, fairly representing the interests of the Working Group, to evaluate and make recommendations on all requested development approvals and CDMP amendments in the Study Area outside the UDB which require initial approval at a public hearing. The committee's recommendations shall specifically address potential impacts on Biscayne National Park and consistency with the relevant provisions of the CDMP. Until the Plan is completed and adopted, the appropriate County Boards will apply heightened scrutiny to proposed changes in the UDB, land use designations and, zoning, including unusual uses. If implementation of the Plan is not initiated by January 1, 2002, the BCC shall re-evaluate and adopt interim measures to further the objectives of the Plan upon recommendation by the review committee.