

**SUMMARY OF RECOMMENDED CHANGES  
2011 EVALUATION & APPRAISAL REPORT (EAR)**

**Public Facilities Element – Natural Groundwater Aquifer Recharge Sub-Element**

**Goals, Objective and Policies:** The entire Sub-Element will be revised to reflect the proper formatting for all Goals, Objectives and Policies, as defined below:

**Goal:** General statement defining what the plan will ultimately achieve, typically beginning with “TO” followed by a transitive verb, such as, TO PROTECT or TO ENSURE.

**Objective:** A more specific statement than the stated Goal; describing actions that will help achieve the goal(s), typically beginning with the active verb providing the general direction, such as, “Implement”, “Promote” or “Protect”. Objectives use the term “will” and allow Policies to specifically require an activity with “shall”.

**Policies:** Specific statements that provide directives on how to achieve the objectives and ultimately the Sub-Element’s goals, typically beginning with phrases like, “The County shall promote...”, “The County shall continue to...” or “The District shall expand...” or similar phrases. Policies use the terms “may” or “shall” to provide specific direction.

**Goals, Objective and Policies:** The entire Sub-Element should be revised to reflect Department name changes, designee changes, renumbering due to objective and/or policy additions and/or deletions, and grammatical changes.

Goal – revisions to reflect all that aquifer recharge area protection entails, and its interdependence with provisions found in other Elements and Sub-Elements; reformatting

Objective 1 – revisions to extend time allowed to complete a periodic task; reformatting

Policy 1.1 – minor revision.

Policy 1.2 - consider revision to identify potable water wellfield locations in the greater Immokalee area.

Policy 1.5 – consider revision to identify department involved with preparing and utilizing the referenced publication; minor revision to update document cite; verify that “as amended” may be used in this context.

Objective 2 – reformatting.

Policy 2.2 – minor revision to update document cite.

Objective 3 – reformatting.

Policy 3.3 – consider revision to reflect coordinated monitoring efforts, and point out monitoring efforts in the greater Golden Gate Estates area.

Policy 3.5 – consider revision to point out efforts in the greater Golden Gate Estates area.

Objective 4 – reformatting.

Policy 4.1 – minor revision to reference another section in same document.

Objective 5 – revisions, including reformatting; removal of undefined term from further use in this Objective and its subsequent Policies.

Policy 5.5 – modify to reduce extent of specificity.

NGWAR Sub-Element – Attached Documents – Numerous changes, with direction to cross-check GMP locations where similar references to maps & figures are found.

**Assessment of the Successes & Shortcomings  
and Recommendations  
for the Public Facilities Element –Natural Groundwater Aquifer Recharge Sub-Element**

**A. Introduction & Background:**

The purpose of the Natural Groundwater Aquifer Recharge Sub-Element is defined within its single Goal, which reads as follows:

**THE COUNTY SHALL IDENTIFY AND PROTECT NATURAL GROUNDWATER AQUIFER RECHARGE AREAS FROM ACTIVITIES THAT COULD DEGRADE AND/OR CONTAMINATE THE QUALITY OF GROUNDWATER.**

The intent of the Natural Groundwater Aquifer Recharge Sub-Element is to assure the provision of efficient and economical services that would enable the citizens of Collier County to meet their needs for the protection of groundwater recharge areas while also assuring public health and safety in accordance with the criteria set forth in Rule 9J-5, F.A.C., and Chapter 163, Florida Statutes.

The annual update and amendment to the Capital Improvement Element, adopted January 28, 2008 included the initial step toward re-naming of the "Drainage" Sub-Element to the "Stormwater Management" Sub-Element. The new name should be used in all references to *that* Sub-Element found in *this* Sub-Element and throughout the Growth Management Plan.

Note that, in one respect, there is overlap in the intended purpose of the Natural Groundwater Aquifer Recharge and Drainage Sub-Elements: both seek to protect aquifer recharge areas. However, the emphasis of the Natural Groundwater Aquifer Recharge Sub-Element is on groundwater protection, whereas the emphasis of the Drainage Sub-Element is on surface water protection. For an evaluation of the Drainage Sub-Element, refer to the Drainage Section of this Report. In addition to the overlap of policies within the Natural Groundwater Aquifer Recharge and Drainage Sub-Elements, there is also an overlap between the intended purpose of the Natural Groundwater Aquifer Recharge Sub-Element and Goal 2 of the Conservation & Coastal Management Element (refer to the CCME Section of this Report), including the Watershed Management Plans discussed under Objective 2.1 of the CCME. EAR-based amendments made to those sections should be reflected in this Sub-Element, as necessary.

As currently formatted, this Sub-Element consists entirely of a single Goal, and its supporting Objectives and Policies.

The provision of public facilities and services for aquifer recharge area protection and watershed management, floodplain management and flood protection, potable water supply, and stormwater management are planned in correlation with future land use projections. This Goal should be expanded to fully capture the County's goals in these areas and ensure collaboration in implementing Objectives and applying Policies. These interdepartmental collaborations should also be recognized, and strengthened if necessary, in the Conservation & Coastal Management Element (CCME) and Intergovernmental Coordination Element (ICE) of this Growth Management Plan.

This Goal should be rephrased to improve its formatting as a "goal".

*[Public Comment from March 15, 2010 EAR Public Meeting – Questioning the status of and adherence to the Comprehensive Watershed Management Plan and the Comprehensive Water Resource Management Plan; another, suggesting that watershed management and water resource management should take a more holistic approach.]*

## **B. Objectives Analysis:**

### General Analysis:

*The Sub-Element Objectives and Policies are implemented primarily by the Collier County Pollution Control & Prevention Department. The Objectives and Policies speak generically about groundwater protection and the identification and protection of aquifer recharge areas. However, virtually all of the Department's work is related to County potable water wellfields (>100,000 GPD design) in accordance with Land Development Code Section 3.06.00 – Groundwater Protection.*

### **OBJECTIVE 1 (MAPPING AND DELINEATION OF RECHARGE AREAS):**

**The County shall continue to review every two years, and revise as necessary, existing map delineations of County potable water wellfields that are most sensitive to contamination from nearby land development and other surface activities. The biennial review and any subsequent map revisions will be based on geologic, hydrogeologic, hydrologic, and updated anthropogenic contaminant data aggregated since the previous revision.**

### Objective Achievement Analysis:

*Currently, Collier County's Pollution Control and Prevention Department uses an advanced 3-dimensional computer model to calculate Wellfield Risk Management Zones around significantly sized existing and planned potable water wellfields (>100,000 GPD design). These Wellfield Risk Management Zones, in the form of maps, are adopted into the County's Land Development Code 3.06.00 Groundwater Protection and placed on the County's Zoning Maps for County planners to use when regulating land development with the intent of protecting potable water wellfields from pollution sources.*

*This Objective should be revised to replace "review every two years" with "**review every three years**" and "The biennial review" with "**The three year review**".*

*The proposed amendments for Objective 1 provides adequate time (3 years) for the development of the proposed Wellfield Risk Management Zones, adoption of the proposed Wellfield Risk Management Zones into Collier County's Growth Management Plan's Future Land Use Element (Maps), and adoption of the proposed Wellfield Risk Management Zones into Collier County's Land Development Code, Section 3.06 "Ground Water Protection." The two years that are presently allotted have been found to be insufficient to complete this objective. The recommended language amendment will provide sufficient time (3 years) to complete this objective.*

Based on the above, this Objective is being achieved and should be retained, essentially as rewritten. This Objective should be rephrased to improve its formatting as an "objective".

*[Public Comment from March 15, 2010 EAR Public Meeting – Questioning the status of and responsibility for monitoring and maintaining our water resources.]*

Policy Relevance:

There are five (5) policies within this Objective.

**Policy 1.1:**

**The County shall revise and update its 3-dimensional computer models of ground water flow around public water supply wellfields, as additional data (e.g., withdrawal rates, numbers and locations of wells within wellfields, and hydrogeologic information) become available.**

This Policy requires that groundwater flow around wellfield modeling be revised, as pertinent data is made available. *The Pollution Control Department implements this Policy. There is one recommended change. The term “ground water” should be replaced by “groundwater” in this Policy, and throughout the remainder of this Sub-Element and entire GMP wherever informally used [not in title of formal document]. This Policy remains relevant and should be retained as revised.*

**Policy 1.2:**

**The County shall identify those County potable water wellfields, or portions of wellfields, which are susceptible to contamination, caused by adjacent or nearby land uses, drainage patterns, geomorphic conditions, soil properties, and/or hydrogeologic factors, including the presence or absence of confining units. This information shall be revised and updated as necessary.**

This Policy requires that the identification of wellfields susceptible to contamination be revised, as pertinent updates are made available. *The Pollution Control Department implements this Policy. There are no recommended changes. This Policy remains relevant and should be retained as written.*

*[Environmental Advisory Council (EAC) Comment from August 11, 2010 EAR Workshop – Suggesting that potable water wellfield identification include locations in the greater Immokalee area.]*

**Policy 1.3:**

**The County shall maintain and update data on existing land uses and land use activities that possess the greatest potential for ground water contamination.**

This Policy requires the County to monitor land uses and land use activities to gauge their potential to contaminate groundwater. *The Pollution Control Department implements this Policy. There are no recommended changes. This Policy remains relevant and should be retained as written.*

*[Public Comment from March 15, 2010 EAR Public Meeting – Questioning the status of and responsibility for monitoring and maintaining our water resources.]*

**Policy 1.5:**

**This Sub-Element shall incorporate by reference annual recharge amounts for the Surficial and Lower Tamiami aquifers and deeper aquifers such as the Sandstone and Hawthorne Aquifers,**

**as described in the South Florida Water Management District's official publications dated April, 2000 (and scheduled to be published in 2006).**

This Policy requires the County to reference a South Florida Water Management District publication to keep current its computer model. A general reference to a 2006 publication however, potentially limits the County's ability to keep this data current in future years as subsequent editions are published. *The Pollution Control Department implements this Policy.* The "official publications" incorporated by reference are the District's Lower West Coast Water Supply Plans. A version was first published in 2000 in three parts: a Planning Document, a Support Document and the Appendices Document. There was an update in the 2005-2006 timeframe – also published in multiple parts. There is an update ongoing that may be completed in the 2010-2011 timeframe.

*This Policy remains otherwise relevant and should be retained and revised to identify the specific SFWMD publication or publications being incorporated by reference into this Sub-Element, such as, **This Sub-Element shall incorporate by reference annual recharge amounts for the Surficial and Lower Tamiami aquifers and deeper aquifers such as the Sandstone and Hawthorne Aquifers, as described in the South Florida Water Management District's Lower West Coast Water Supply Plan, as amended.***

*[Environmental Advisory Council (EAC) Comment from August 11, 2010 EAR Workshop – Questioning whether the County department involved with preparing and utilizing this publication should be identified by this Policy.]*

*[Planning Commission (CCPC) Comment from August 27, 2010 EAR Workshop – Questioning whether the use of "as amended" in this context would make this Policy self amending.]*

## **OBJECTIVE 2 (PROTECTION OF GROUNDWATER QUALITY):**

**Ground water quality shall meet all applicable Federal and State water quality standards.**

### Objective Achievement Analysis:

This Objective seeks to protect natural groundwater aquifer recharge features through the imposition of quantity and quality standards.

*Collier County has implemented numerous proactive programs designed to protect Collier County's groundwater quality from man-made pollution sources and hence remain compliant with this Objective. In addition, Collier County has also developed programs designed to respond to pollution releases into the environment and to monitor their satisfactory cleanup. Finally, the Collier County Pollution Control & Prevention Department has developed strong working relationships with the Florida Department of Environmental Protection, Collier County Environmental Health and Engineering Department, South Florida Water Management District, Big Cypress Basin Board and the Florida Department of Agriculture and Consumer Services that enhance the County's ability to effectively coordinate efforts to meet this Objective.*

Based on the above, this Objective is being achieved and *should be retained*, essentially *as written*. This Objective should be rephrased to improve its formatting as an “objective” such as, **Protect natural aquifer recharge areas to ensure the highest water quality practical toward meeting applicable Federal and State water quality standards for ground water, or, Protect groundwater from pollutant discharges that may cause exceedance of applicable Federal and State water quality standards**; followed by a “policy”, such as:

**Policy 2.0.1:**

**The County shall protect groundwater from pollutant discharges that might cause exceedance of applicable Federal and State water quality standards.**

*[Public Comment from March 15, 2010 EAR Public Meeting – Suggesting a number of these ‘other regulatory agencies’ be identified, including the Federal Emergency Management Agency (FEMA), Department of Environmental Protection (DEP), and the U.S. Army Corps of Engineers (USACOE), as those among whom water resource management is coordinated – including surface water, stormwater, and water supplies for municipal services.]*

Policy Relevance:

There are four (4) policies within this Objective.

**Policy 2.2:**

**Non-agricultural developments requiring an Environmental Resources Permit from the South Florida Water Management District (SFWMD) shall preserve groundwater recharge characteristics as required by the SFWMD and as set forth in the SFWMD’s Basis for Review, dated January 2004 and as regularly updated. Ground water recharge shall also be protected through the application of the retention/detention requirements and allowable off-site discharge rates for non-agricultural developments specified in Policies 6.2 and 6.3 in the Drainage Sub-Element.**

This Policy identifies groundwater protection requirements of the appropriate Water Management District, with this document reference appearing to be out of date. This Policy also refers to other provisions found in another Public Facilities Element Sub-Element. *The Pollution Control Department implements this Policy. This Policy should be revised to replace “Basis for Review, dated January 2004” with “Environmental Resource Permit Information Manual, Volume IV, 2009”.*

**OBJECTIVE 3 (GROUNDWATER QUALITY MONITORING):**

**The County shall continue to collect and evaluate ground water quality data, identifying ambient water quality values and trends, comparing analyzed concentrations to Florida Ground Water Guidance Concentrations, and providing information to water resources planning and management entities, and to the general public.**

Objective Achievement Analysis:

*The above Objective requires Collier County to collect and analyze groundwater quality data for comparison to State Standards, and to be able to provide information on analysis results to all*

*interested parties. Presently Collier County's Pollution Control and Prevention Department samples a trend network of groundwater monitoring wells semi-annually, and reports on the data annually. In addition, a Golden Gate Groundwater Baseline Monitoring Report had been completed in 2004, which assessed the groundwater quality data obtained from 84 residential potable water wells. Residents were provided groundwater laboratory results for the well they owned. A follow-up Golden Gate Estates study is presently underway, which will compare this most recent groundwater quality data with the historical 2004 reported data to determine water quality trends.*

Based on the above, *this Objective is being achieved and should be retained, essentially as written. This Objective should be rephrased to improve its formatting as an "objective".*

*[Public Comment from March 15, 2010 EAR Public Meeting – Suggesting that watershed management and water resource management should take a more holistic approach.]*

Policy Relevance:

There are five (5) policies within this Objective.

**Policy 3.3:**

**The County will annually assess its groundwater quality monitoring data to determine whether monitoring activities and County Ordinances require expansion, modification or reduction.**

This Policy requires the County to regularly re-assess its groundwater quality monitoring efforts. This Policy remains relevant and *should be retained as written.*

*[Environmental Advisory Council (EAC) Comment from August 11, 2010 EAR Workshop – Suggesting the County coordinate with SFWMD staff to monitor our water resources for salt water intrusion and tracking salinity trends.]*

*[Environmental Advisory Council (EAC) Comment from August 11, 2010 EAR Workshop – Emphasizing the importance of ongoing monitoring efforts for both quality and availability in the greater Golden Gate Estates area. Anecdotal evidence showing that the shallower wells run dry in the dry-weather seasons of the year should not be overlooked.]*

**Policy 3.5:**

**Collier County shall continue to conduct water resource planning with appropriate County, City of Naples, and SFWMD staff to provide for ground water resource development, utilization, and conservation.**

This Policy requires the County to coordinate their water resource planning efforts with other agencies. This Policy remains relevant and *should be retained as written.*

*[Public Comment from March 15, 2010 EAR Public Meeting – Suggesting a number of these 'other regulatory agencies' be identified, including the Federal Emergency Management Agency (FEMA), Department of Environmental Protection (DEP), and the U.S. Army Corps of Engineers (USACOE), as those among whom water resource management is coordinated – including surface water, stormwater, and water supplies for municipal services.]*



*[Environmental Advisory Council (EAC) Comment from August 11, 2010 EAR Workshop – Suggesting that water resource planning efforts include the greater Golden Gate Estates area, and take into consideration public health factors.]*

**OBJECTIVE: 4 (PUBLIC EDUCATION WITH REGARD TO GROUNDWATER PROTECTION ISSUES):**

**The County shall continue current activities of providing the public with educational materials concerning ground water protection issues in Collier County. These may include, but shall not be limited to, the preparation of annual technical publications of ground water quality data, an informational website for groundwater quality issues, general information publications, establishment of a speakers' bureau, K-12 classroom presentations, and in-service teacher workshops and seminars.**

Objective Achievement Analysis:

*This Objective requires continuation of County public educational activities with regard to groundwater protection issues. The Pollution Control & Prevention Department maintains a website that identifies all of the programs designed to protect the County's groundwater from pollution. The team prepares and distributes an Annual Newsletter designed to educate businesses on the proper method of managing the hazardous wastes they generate. Team members have also spoken before various groups/organizations about what Pollution Control does and the team remains available to answer any questions the public, regulatory community, and/or policy makers may have.*

Based on the above, this Objective is being achieved and *should be retained*, essentially as written. This Objective should be rephrased to improve its formatting as an "objective".

Policy Relevance:

There are two (2) policies within this Objective.

**Policy 4.1:**

**The County shall continue to advise the public on the appropriate disposal methods for hazardous wastes, for the purpose of reducing or avoiding the potential for groundwater contamination. In performing this task, the County may utilize the public educational measures listed within Objective 4 of this Sub-Element, or any other measures which may be appropriate.**

This Policy requires the development of a public awareness program relative to hazardous waste disposal issues. This Policy remains relevant and *should be retained as written*. The reference to "Objective 4" should be revised to correspond to the reformatting of said Objective, as applicable.

**OBJECTIVE 5 (PROTECTION OF CRITICAL RECHARGE AREAS AND GROUNDWATER RESOURCES):**

**The County shall implement plans to preserve critical ground water recharge areas and ground water resources, and will review, evaluate, and revise (if warranted) those plans and actions, based on the best available geologic, hydrologic, hydrogeologic, and anthropogenic contaminant data.**

Objective Achievement Analysis:

This Objective shares portions of its stated intent with Objectives 1, 2 and 3 above. This Objective focuses the County's responsibilities on "critical" recharge areas and resources, whereas the above Objectives identify all recharge areas and resources related to groundwater protection. Protecting water quality and minimizing flood hazards employ watershed-based approaches that balance environmental, economic and engineering considerations to meet these standards. This Objective is being achieved and *should be retained, essentially as written*. This Objective *should be revised to replace "implement" with "continue implementing"* and rephrased to improve its formatting as an "objective".

*[Public Comment from March 15, 2010 EAR Public Meeting – Suggesting that watershed management and water resource management should take a more holistic approach.]*

*[Planning Commission (CCPC) Comment from August 27, 2010 EAR Workshop – Suggesting that the use of the term "critical" has no clear definition and should be removed from this Objective and where found in its subsequent Policies.]*

*[Environmental Advisory Council (EAC) Comment from November 3, 2010 EAR Adoption Hearing – Concurring with the CCPC suggestion to remove the term "critical" from these entries.]*

Policy Relevance:

There are five (5) policies within this Objective.

**Policy 5.5:**

**Collier County shall continue to operate and maintain a hazardous waste collection facility. The facility shall operate five (5) days per week and will accept household and small business hazardous wastes. Additionally, the County shall continue to hold its hazardous waste collection day at least twice per year targeting residential households but also allowing small businesses to participate.**

This Policy requires the County to continue operating its hazardous waste collection facility. This Policy remains relevant, but provides a level of specificity regarding days and hours of operation that is not necessary in a comprehensive planning document. This Policy remains relevant nonetheless and *should be retained* if rewritten to provide a lesser amount of specificity appropriate for the GMP.

**CONSIDER INTRODUCING A NEW OBJECTIVE AND SUBSEQUENT POLICY OR POLICIES FOLLOWING FROM THE 2009 ADOPTION OF HB 697.**

*[Planning Commission (CCPC) Comment from August 27, 2010 EAR Workshop – Suggesting that the amount of change introduced with Objectives and Policies following from the adoption of HB 697 may be misplaced and consideration for any such change may serve better if consolidated to address multiple Elements or Sub-Elements at another location , and should be removed from the/ as a proposed revision.]*

*[Environmental Advisory Council (EAC) Comment from November 3, 2010 EAR Adoption Hearing – Concurring with the CCPC suggestion to remove the HB 697 changes from this Sub-Element and consolidate them at another location.]*

**C. Attached Documents Analysis:**

***Map 1 Groundwater recharge to the Surficial Aquifer***

*This map should be updated.*




***Map 2 Groundwater recharge to the Lower Tamiami Aquifer***

*This map should be updated.*

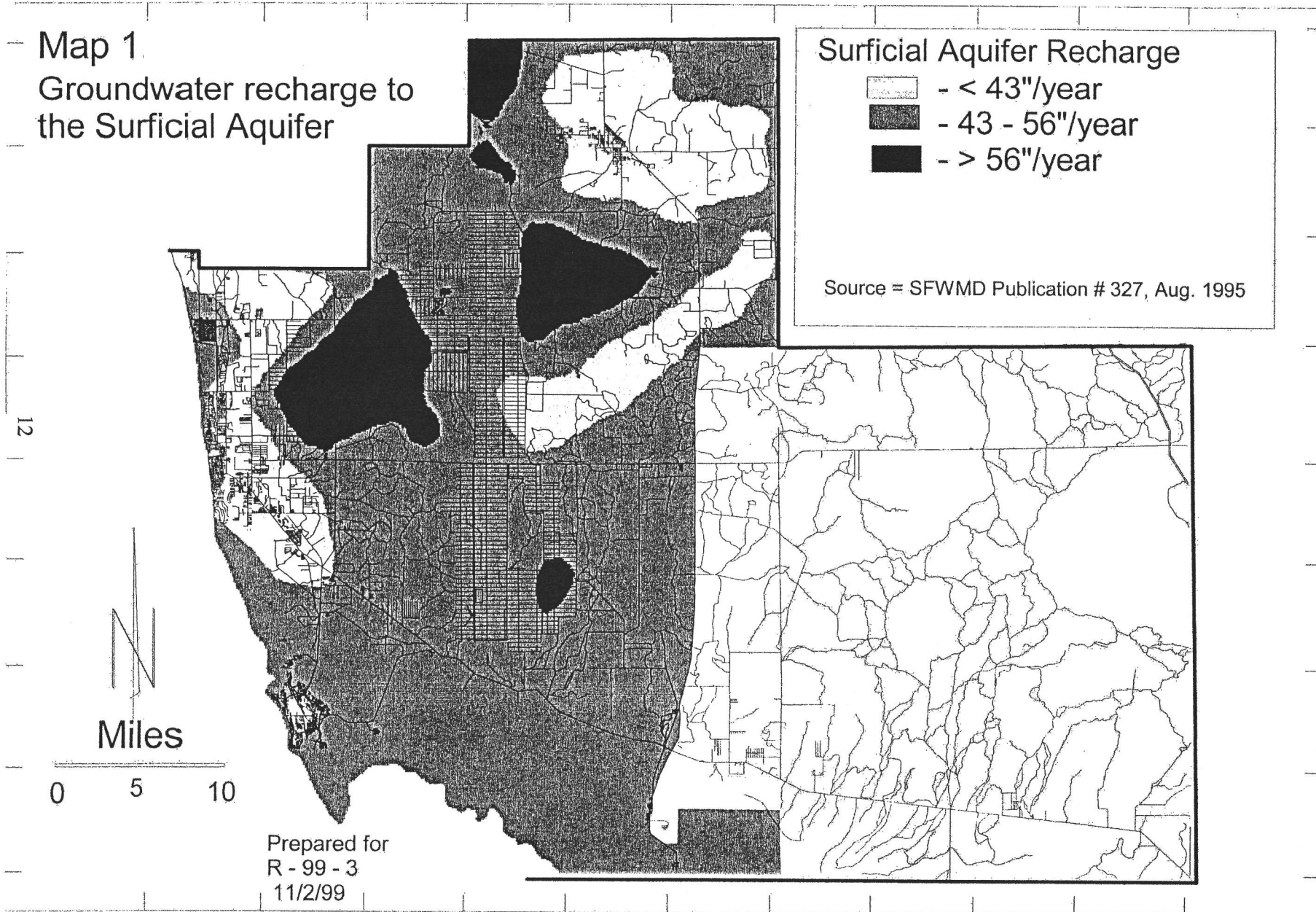
*Pages 10 and 11 Blank*  
***PUBLIC FACILITIES ELEMENT – DRAINAGE SUB-ELEMENT***  
*Updated for December 2010 CCPC Adoption Consideration*

Map 1.  
Groundwater recharge to  
the Surficial Aquifer

Surficial Aquifer Recharge

-  - < 43"/year
-  - 43 - 56"/year
-  - > 56"/year

Source = SFWMD Publication # 327, Aug. 1995







Prepared for  
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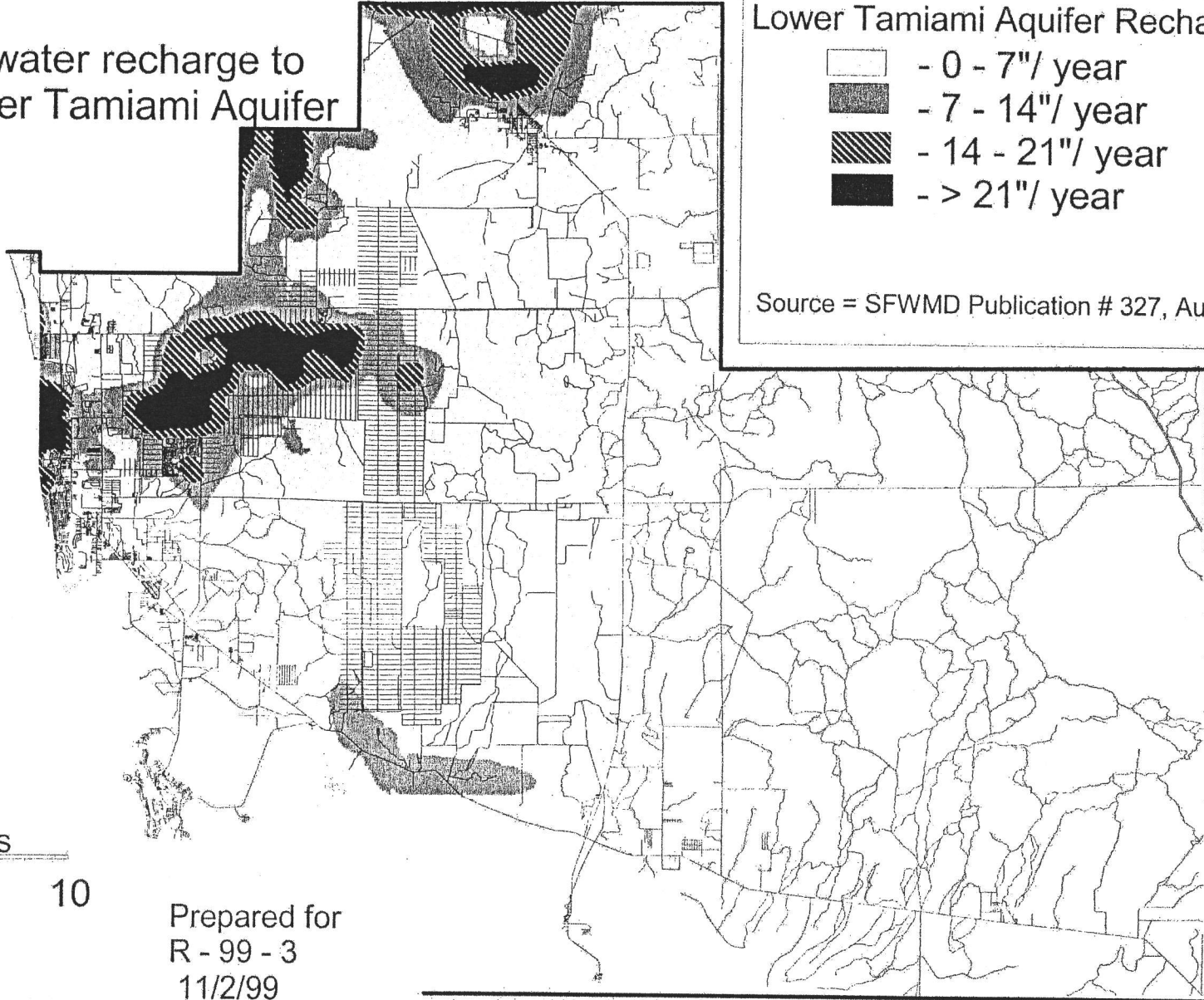
# Map 2

## Groundwater recharge to the Lower Tamiami Aquifer

### Lower Tamiami Aquifer Recharge

-  - 0 - 7"/ year
-  - 7 - 14"/ year
-  - 14 - 21"/ year
-  - > 21"/ year

Source = SFWMD Publication # 327, Aug. 1995



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