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EXECUTIVE SUMMARY

This project has two primary and equally important goals. The first goal is to improve the surface water quality of the flow in Tumblin Creek and East Tumblin Creek and the stormwater of the Tumblin Creek watershed. Improved water quality is essential to the health of the creeks, the sensitive and diverse ecosystem of Paynes Prairie and to groundwater quality as it enters the Floridan aquifer. The most noted water quality concerns in these watersheds and the receiving water bodies are elevated nutrients and excessive erosion and deposition. The second goal is to improve water quality through means congruent with City redevelopment policies within the Tumblin Creek watershed and consistent with City, County, St. Johns River Water Management District (SJRWMD), State, and Federal environmental requirements. Characterization of redevelopment impacts on water quantity and water quality may not be adequately addressed by existing environmental requirements. Opportunities may exist for collaboration with those agencies to improve the environmental requirements.

The initial effort to develop a watershed management plan for the restoration of the stream system involved collecting and synthesizing the large volume of watershed information, followed by a field data collection effort to characterize the stream system and the hydrology of its watershed. These data were then used to perform a geomorphic analysis, a hydrologic and hydraulic analysis, and a water quality analysis of the stream system. Regional, sub-regional, and onsite treatment systems for water quality and quantity were field inventoried and analyzed. Findings from these analyses were used to formulate the restoration alternatives.

The recommended watershed improvement alternatives include the following:

- Five sub-regional ponds.
- Three sub-regional treatment wetlands.
- Three storm sewer improvement projects.
- At least eight potential exfiltration projects.
- A trash trap.
- Buried sill structures and other localized stabilization measures.
- A regional wetland treatment system.
- Twenty potential Best Management Practices (BMP) retrofit opportunities.
- Twenty potential on-site retrofit opportunities.
- Recommendations for future regulatory changes.
- A strategy for CRA for implementation.

Figure 1 shows the locations of all but the on-site and stream stabilization measures.

11.0 COMMUNITY REDEVELOPMENT AGENCY STRATEGY

As stated previously, the second and equally important goal of the Tumblin Creek Watershed Management Plan is to improve water quality through means conforming to the City's redevelopment policies for the Tumblin Creek watershed and consistent with City, County, SJRWMD, State, and Federal environmental requirements. Characterization of redevelopment impacts on water quantity and water quality may not be adequately addressed by existing environmental requirements. Opportunities may exist for collaboration with those agencies to improve the environmental requirements. Although the second goal is similar to the first goal, the priorities—and therefore the strategies—are different. This Section of the report provides the recommended implementation strategy that may be used by the Community Redevelopment Agency.

The Section is divided into three parts: administration, implementation (i.e., construction) projects, and policy changes/research. Each part is an important component of the strategy.

11.1 ADMINISTRATION OF TREATMENT AND ATTENUATION BANKING

One of the cornerstones of the implementation strategy for CRA is offsite treatment and attenuation of stormwater. The most pertinent opportunities are provided in Sections 5 and 9, with additional opportunities presented in Section 6. With the number of opportunities to reduce pollutant loads and provide offsite treatment, it will be important to establish a way to administer the treatment and attenuation credits (i.e., treatment and attenuation banking). Administration should include, at a minimum, the following:

- Setting and updating credit costs.
- Tracking credits earned through implementation projects.
- Tracking credits used through redevelopment projects.
- Collecting on purchased credits.
- Ongoing prioritizing of implementation projects.

One of the factors that can aid in treatment and attenuation banking is the economies-of-scale realized in developing larger offsite projects. Typically, these projects can provide a lower cost per unit area served than onsite treatment and attenuation. Therefore, it is possible to set up treatment credits costs within a flexible range. The higher end of the range may be established by determining the cost of onsite treatment for typical redevelopment projects and charging near that cost for credits. After the original design/permitting/construction cost and administrative costs are paid, the remainder may be used as working capital for additional implementation projects. A value of approximately $55,000/acre (in 2006 dollars) plus the current cost of land per acre times 0.1 (as an approximation of the developable land not needed for onsite treatment) may represent a reasonable upper limit for the treatment and attenuation credit cost. The lower end of the range should be computed based on the cost of design, permitting, construction, administration, and potential financing of implementation projects on a per-acre basis. This lower end cost may vary over time as more expensive projects are needed for implementation

credits. Regardless, the CRA may set credit costs within the range discussed above, depending on its priorities and those of Public Works. Additionally, it may be advantageous on many of these retrofit projects for Public Works and CRA to cooperate in a joint venture where land acquisition, construction costs, and water quality and attenuation credits can be shared to take advantage of the economies-of-scale mentioned above. Water quality and attenuation credits for redevelopment and pollutant-load-reduction goals can be tracked and administered through the same banking mechanism.

The City of Gainesville's Public Works Department's Stormwater Division currently manages a treatment credit bank through its Stormwater Management Utility. Treatment credits are established through a standard set of water quality calculations that are based on land use and area. A similar mechanism is recommended for CRA, but it should first be coordinated with St. Johns River Water Management District Environmental Resource Permitting.

11.2 IMPLEMENTATION PROJECTS

The projects that are best suited for reducing pollutant loads, providing flood attenuation, and creating substantial redevelopment credits for Environmental Resource Permitting are the following:

- Sorority Woods project discussed in Section 5.3.2.
- Tumblin Creek Park project discussed in Section 5.3.2.
- The exfiltration projects discussed in Sections 5.3.3 and 7.2 and presented below in Table 11-1.
- The swale treatment project receiving runoff from NW & SW 6th St (Site ID 3 from Table 5-4).

Given the conceptual level of the projects, they are very similar in terms in terms of their cost-effectiveness for pollutant removal and redevelopment credits. Exfiltration costs will vary based on a variety of factors, but an approximate value of $500/foot may be used for design, permitting, and construction. The projects in Table 11-1 are generally less than 1,000 feet.

Table 11-1 Exfiltration Projects

Approximate Location	Approximate Acres Served*
7th Avenue pilot area	14
NW 1st Street between NW 4th Avenue and NW 8th Avenue	10
NW 4th Street between NW 4th Avenue and NW 7th Avenue	14
NW 4th Avenue between NW 1st Street and NW 3rd Street	21
NW 3rd Street between NW 1st Avenue and NW 4th Avenue	12
NW 3rd Avenue between NW 9th Terrace and NW 7th Street	13
NW 3rd Avenue between NW 10th Street and NW 12th Street	10

Table 11-1 Exfiltration Projects	
Approximate Location	Approximate Acres Served*
NW 12th Street between NW 3rd Avenue and SW 2nd Avenue	15
NW 15th Street between NW 3rd Avenue and West University Avenue	9
NW 14th Street Between West University Avenue and NW 5th Street	12

*Some areas may overlap, so the total area served by all projects may be less than the sum in this table. Site constraints and other factors information collected during design will determine the final area that may be served.

Additional opportunities are presented in Sections 5 and 6 that may also be considered for implementation but which, based on project size (reduced economies-of-scale decrease the cost-effectiveness) and property ownership (mostly privately owned land), are not given the priority of the projects discussed above.

11.3 POLICY CHANGE AND RESEARCH RECOMMENDATIONS

Policy change and research recommendations are presented together since research is necessary for some of the policy changes discussed. Although policy change and research recommendations are included as part of the strategy for the CRA, they are unlikely to fulfill an immediate need to provide multiple water resources benefits and encourage urban redevelopment. They represent long-term opportunities that are generally more directed towards alternative water quality treatment than flow attenuation. The following best management practices represent the promising means of achieving additional treatment credit that are not currently recognized through Environmental Resource Permitting:

- End-of-pipe treatment—This BMP type includes pollutant-removal devices such as baffle boxes and hydrodynamic separators. Their inability to achieve presumptive treatment levels and the small amount of independent test data on their effectiveness are current impediments to their acceptance by the Water Management Districts. A study currently being conducted by the University of Florida may help to gain acceptance of these devices for partial treatment. They do not provide water quantity attenuation, so that—along with the additional treatment—would need to be addressed through other means.

- Pervious parking—Pervious parking has had mixed results, although it is generally very effective when properly designed and constructed. Recognition of pervious parking by the Water Management Districts would reduce the size of other BMPs. Development of design standards for application of pervious parking may help with acceptance by the Water Management Districts.

- Rooftop runoff versus parking lot runoff—Impervious area within a given land use type is generally given the same water quality characteristics. It is possible that runoff from rooftops may have lower concentrations of some pollutants than runoff from parking areas, opening the possibility for better recognition of water

quality impacts from higher density areas with parking garages versus areas with similar imperviousness and uncovered parking. For this possibility to get recognition from the Water Management Districts and the Department of Environmental Protection, it would be necessary to collect data clearly demonstrating that there is a difference between the two. The CRA may consider partially funding this type of research.

- Street sweeping—Street sweeping with newer equipment has been shown to provide substantial pollutant reduction. However, it would likely need to be used in conjunction with other BMPs to achieve targeted pollutant removal percentages, and flow attenuation would still need to be provided through other means.

- Leaf collection—Leaf collection may provide an effective means of nutrient reduction. However, there is little documentation on the effectiveness of this BMP. The CRA may consider sponsoring a research project that would quantify pollutant removal effectiveness of this BMP. Its application for redevelopment would need to be part of a BMP treatment train approach.

- Stormwater reuse—Stormwater reuse through withdrawals from wet detention ponds or collection in and pumping from cisterns can be a very effective means of reducing flows and pollutant loads on a longer-term basis. However, this BMP is currently used primarily as an alternative water supply source. There is a reasonable amount of documentation on its effectiveness, but the Water Management Districts do not recognize it under Environmental Resource Permitting.

Tumblin Creek Watershed Management Plan

Balancing Redevelopment Goals, Water Quality Improvements, and Wetland Restoration

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Purposes

- Primary Goals:
  - Water quality improvements
  - Facilitate redevelopment while addressing water quantity and water quality

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Treatment Options

- Local Treatment
  - Low Impact Development
- Sub-regional Treatment
  - Stormwater ponds
  - Treatment wetlands/rehydration
  - Exfiltration
- Regional Treatment
  - Trash Trap
  - Treatment wetlands
- Stream Restoration

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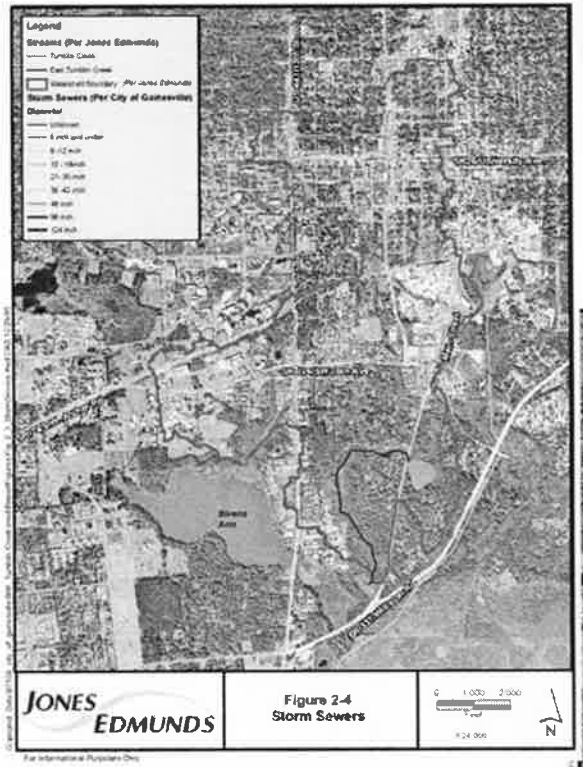
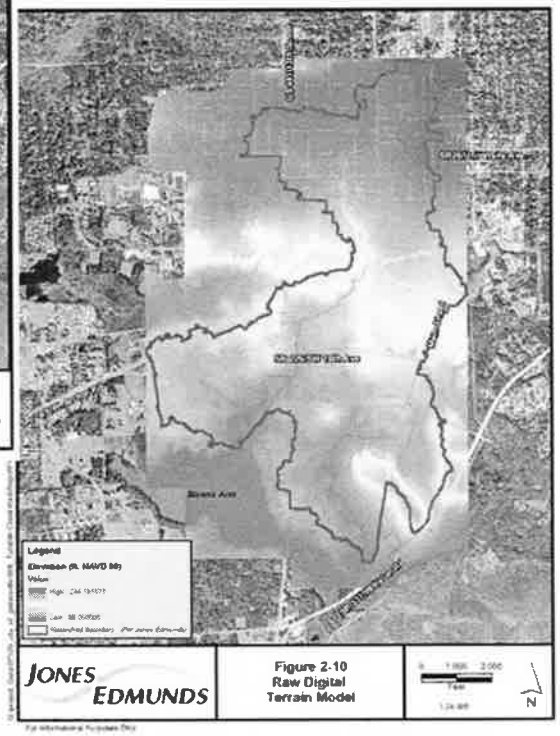
Literature Review and Data Collection (Section 1 and 2)





- Historical perspective
- Current status/trends
- LiDAR
- Storm sewers
- Channel survey

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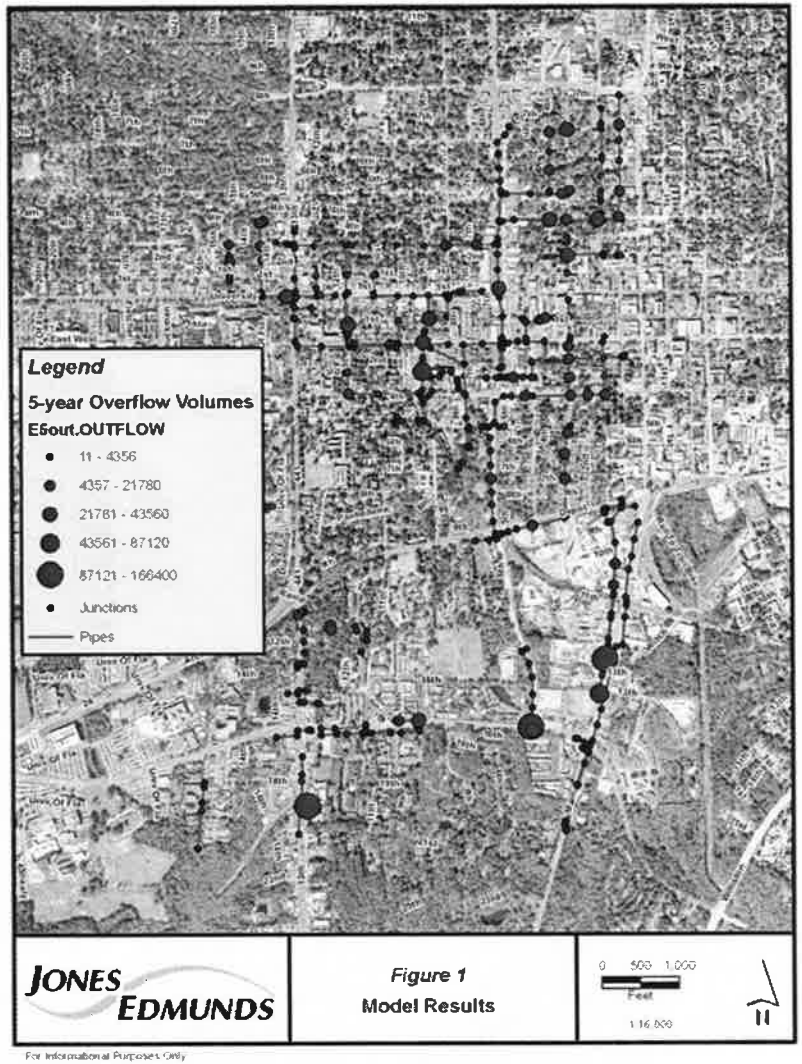
Water Quantity (Section 3)



- Stream modeling
  - FEMA update
- Storm sewer modeling
  - Localized flooding
  - Capacity problems
- Widespread capacity issues
- Leads to local and subregional solutions
- Exfiltration opportunities

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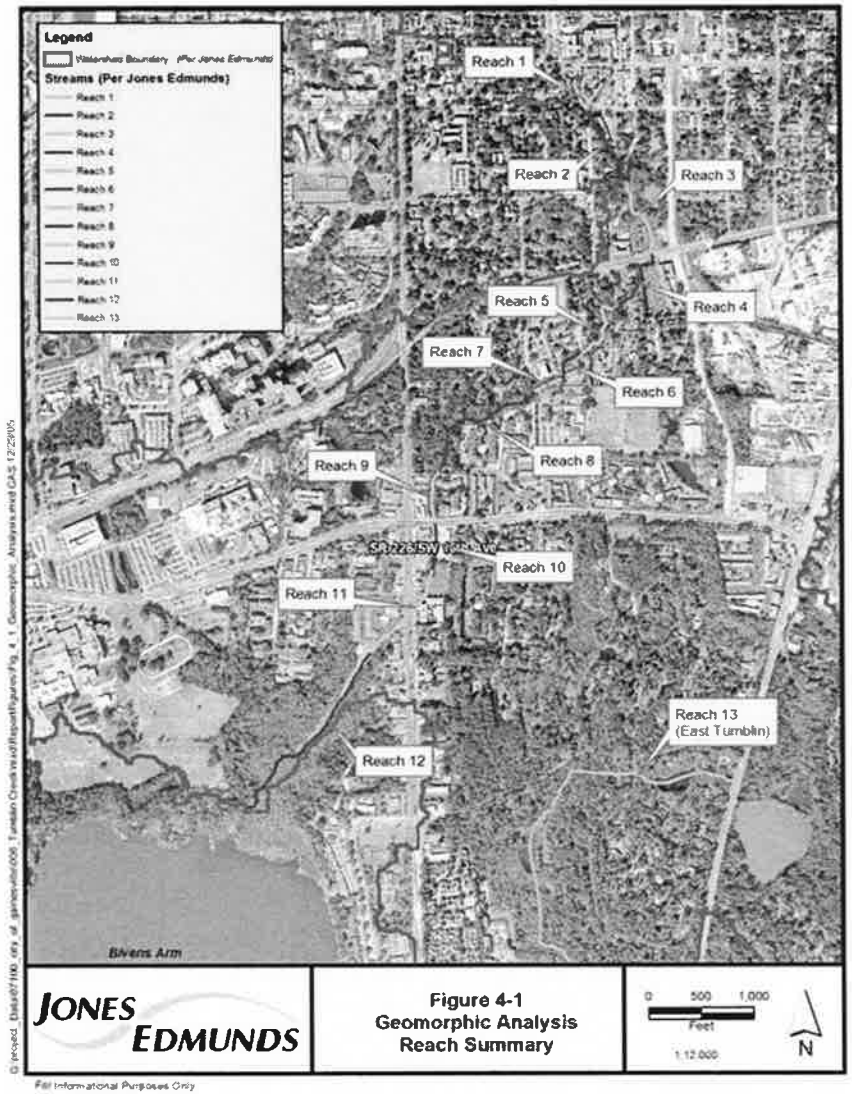
Erosion Control and Stream Restoration (Section 4)



- Geomorphic analysis
- Channel modifications and protection on Tumblin
- No recommendations for East Tumblin
- Less relevance to CRA

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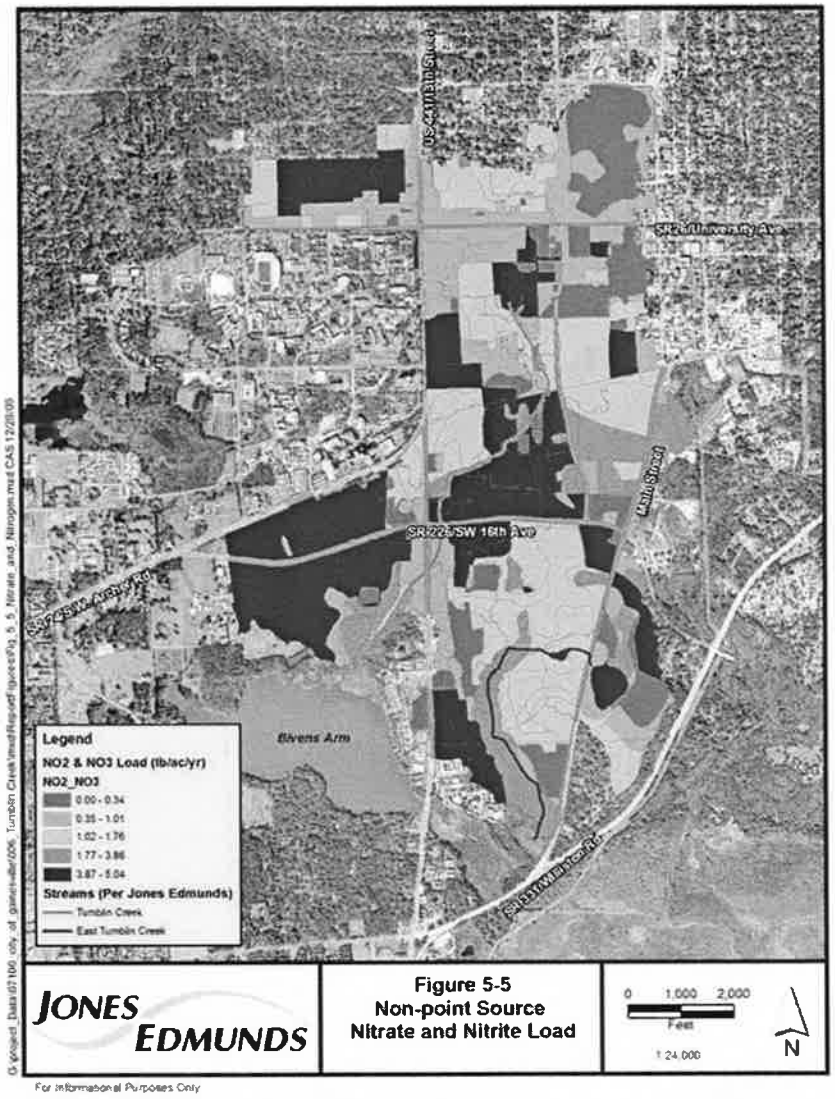
Pollutant Loading Assessment and Treatment Options (Section 5)



- Pollutant loading model
  - UMU Analysis
- Regional and subregional treatment options
- Retrofit sites
- Exfiltration sites

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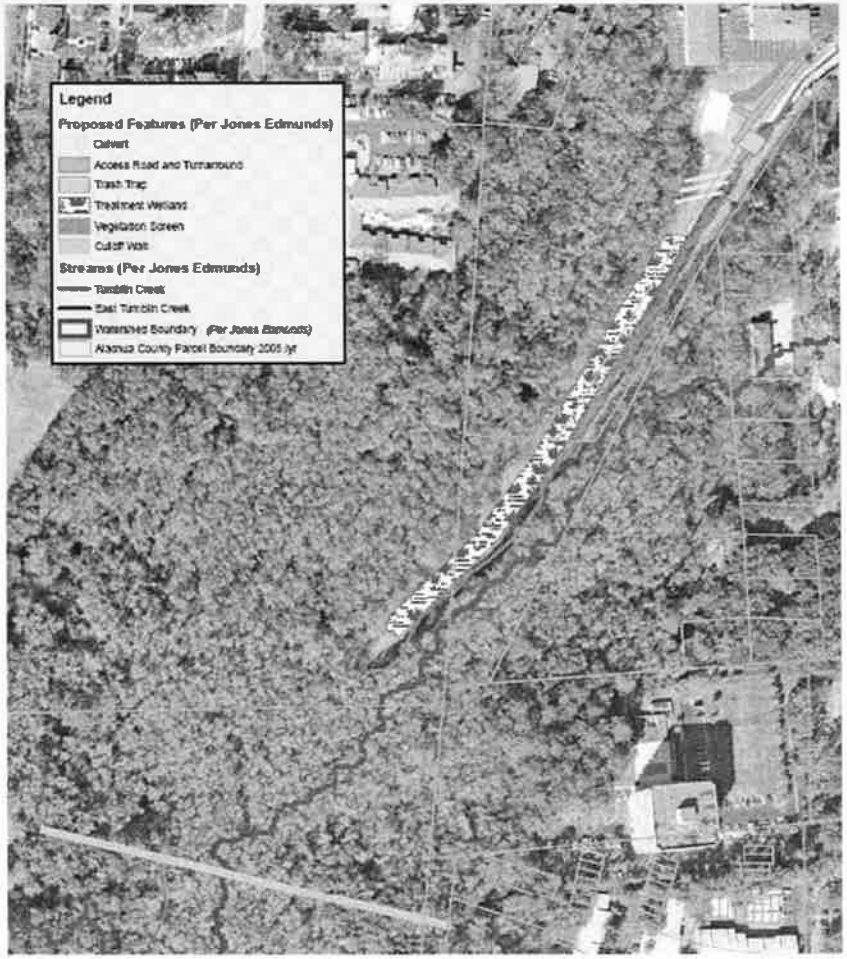
Regional Treatment (Section 9)



- Five options evaluated
- Nitrogen reduction estimated to be 6 to 15 percent

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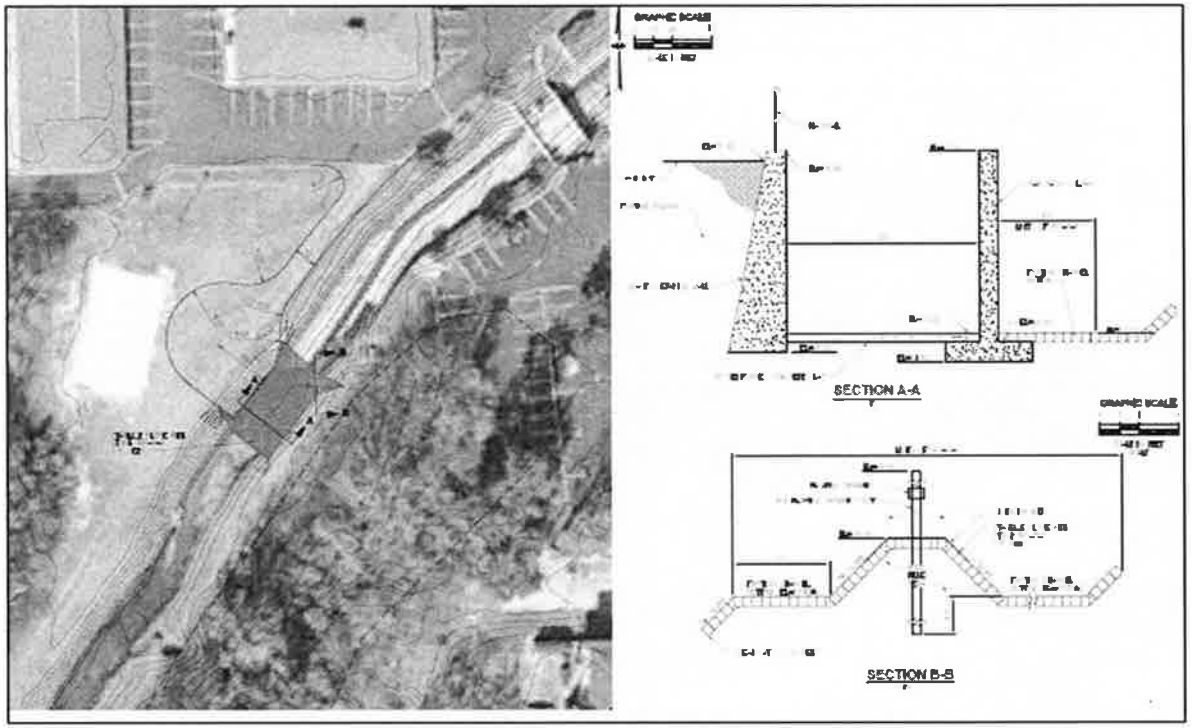
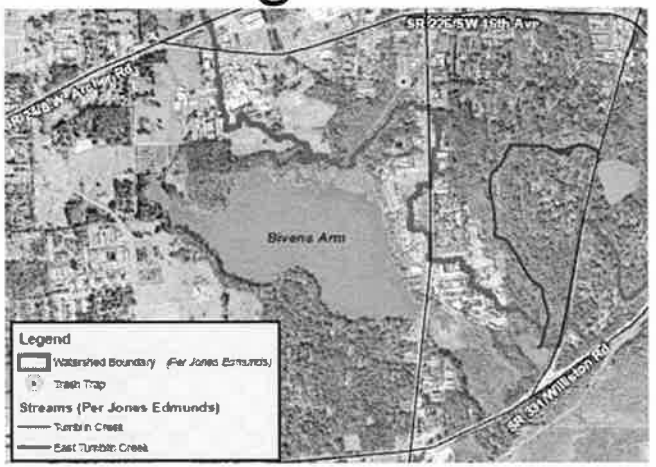
Regional Treatment (Section 8)



- Trash Trap
  - Similar to Sweetwater design



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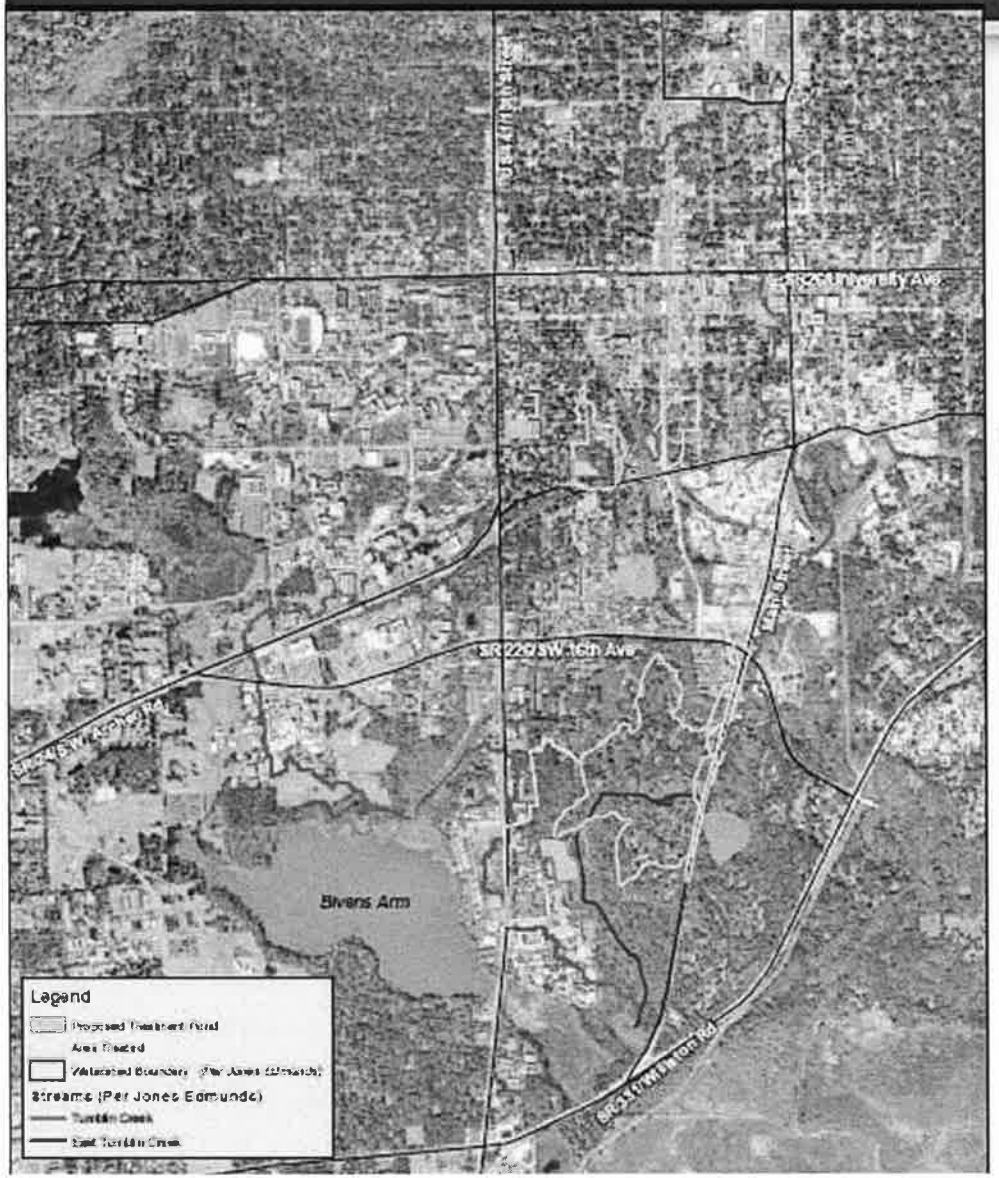
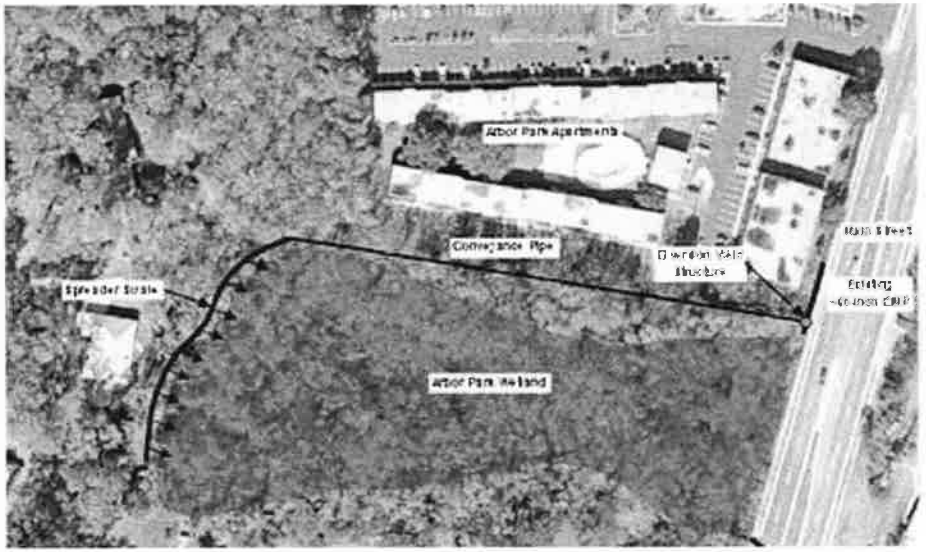
Subregional Treatment (Section 5)



- Sorority Woods, Tumblin Creek Park, Colclough Pond, Kirkwood, Arbor Park, Bivens Arm Nature Park



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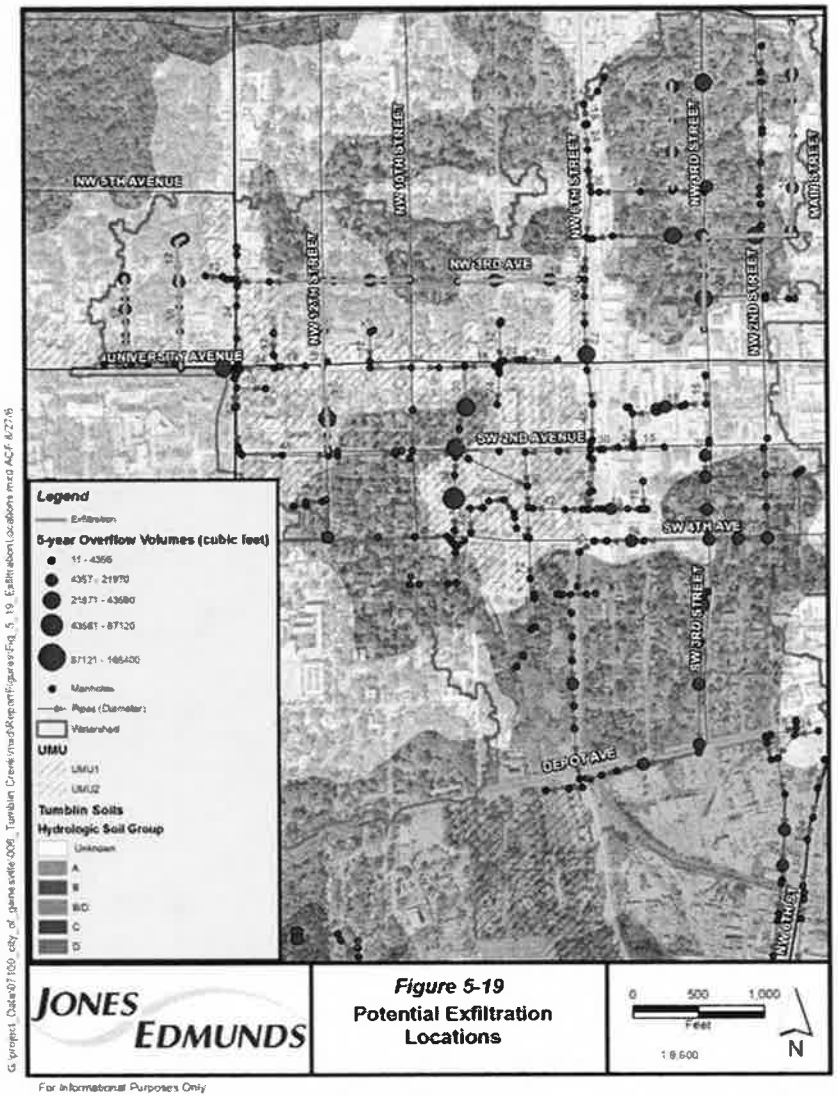
Subregional/Local Treatment (Section 5)



- Potential Exfiltration Sites

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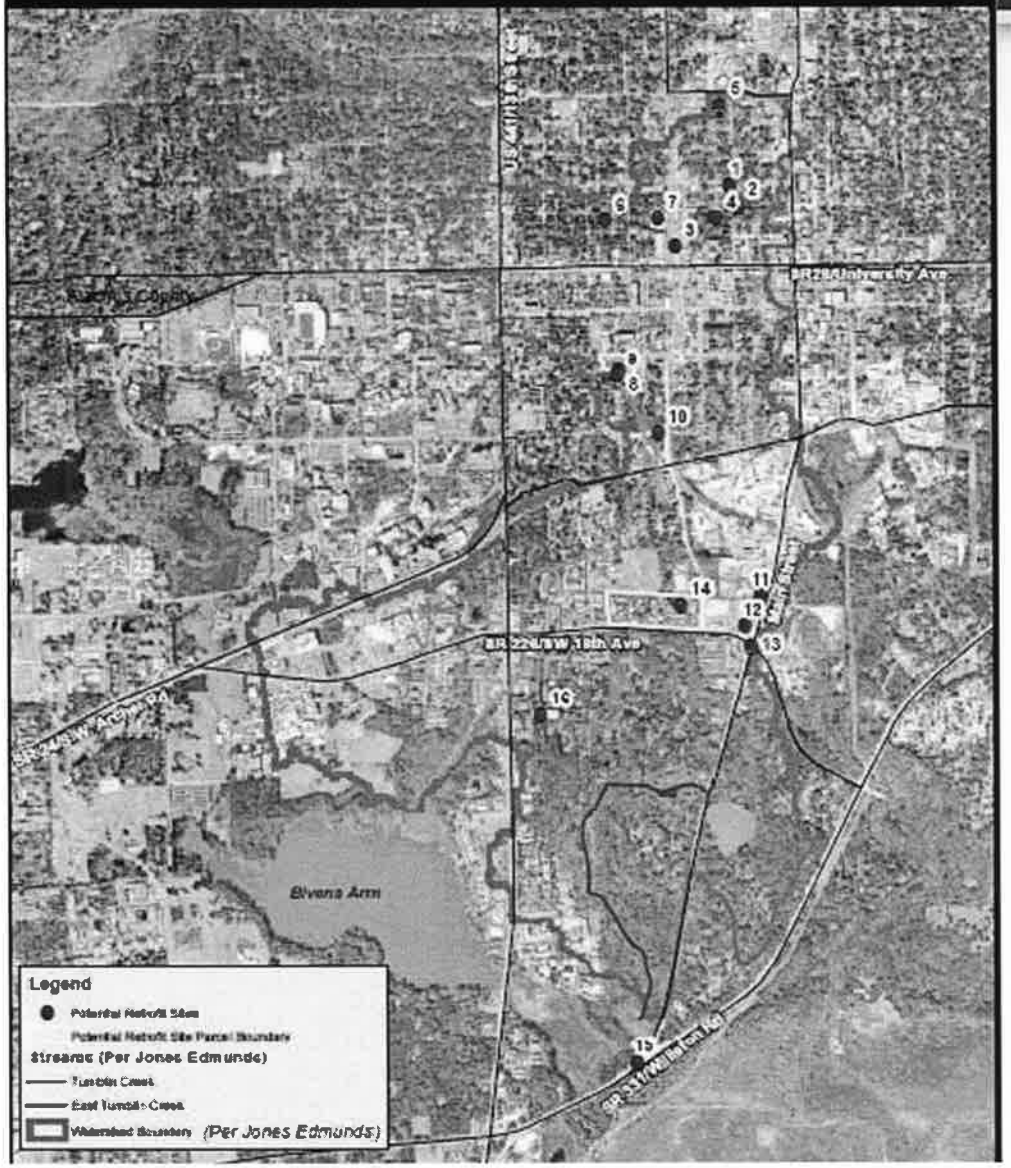
Local Treatment (Section 5)



- Fifteen potential sites evaluated
- Could be used for redevelopment compensation

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Onsite and Additional Treatment Options (Section 6)

- LID and opportunity sites
- Rooftop versus parking lot runoff
- Street sweeping and leaf collection
- Private property retrofit
- Hydrodynamic separators
- Regulatory acceptance

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Watershed Management Strategy (Section 10)

- Comprehensive Plan Requirements
- CIP Prioritizing Criteria
- Recommended Stormwater Utility CIP Projects

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Community Redevelopment Agency Strategy (Section 11)

- Administration of Treatment and Attenuation Banking
- Implementation Projects
- Policy Change and Research Recommendations

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