



# Board of County Commissioners Leon County, Florida

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## Workshop Request Executive Summary

December 14, 2010

### **Title:**

Approval of the City of Tallahassee's Updated Water and Sewer Master Plans in Accordance with the Water and Sewer Agreement between the City of Tallahassee and Leon County

### **Staff:**

Parwez Alam, County Administrator  
Alan Rosenzweig, Assistant County Administrator  
Tony Park, P.E., Director of Public Works

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### **Issue Briefing:**

In accordance with the Water and Sewer Agreement, this item seeks Board approval of the City of Tallahassee's 2030 Master Sewer Plan Phase 2 approved by the City February 2010 and the City of Tallahassee's Water Master Plan approved by the City August 2010. Both documents are available for review in the County Commission Chamber's Lobby, and the County Commissioner's Conference Room, located on the 5<sup>th</sup> floor of the Leon County Courthouse. They can also be reviewed at Leon County Public Works, located at 2280 Miccosukee Road.

### **Fiscal Impact:**

The adoption of this item has no direct fiscal impact to Leon County. However, as noted in the recommendations, the ability to implement the Water and Sewer master plans will require a substantial investment by the community. Staff is recommending that the full implementation of these plans be included in any one cent infrastructure sales tax extension referendum.

### **Staff Recommendation:**

- Option #1: Approve the City of Tallahassee's 2030 Master Sewer Plan Phase 2 dated January, 2010.
- Option #2: Approve the City of Tallahassee's Water Master Plan dated April, 2010
- Option #3: Authorize that the projects identified in the Sewer Master plan, as well as the additional projects identified by staff, be included in any one cent infrastructure sales tax extension referendum.
- Option #4: Authorize that when funded by the sales tax extension, equal water and sewer rates would apply for all customers within Leon County inclusive of any surcharges.

## **Report and Discussion**

### **Background:**

Leon County approval of the City of Tallahassee's (City) Master Plans for Water and Sewer Service within the Urban Services Area is required in Paragraph 5.a. of the current Water and Sewer Agreement (WSA) (Attachment #1). Once approved, these Master Plans will serve as the basis for the City's annual submission of their proposed 5 Year Capital Improvements Plan (CIP) for water and sewer projects. Paragraph 5.b. of the WSA requires that the County approve this 5 Year CIP annually. This workshop is intended to provide the Board with an analysis of the proposed Master Plans and also background information regarding the WSA and related issues.

### **Analysis:**

#### ***Water and Sewer Agreements:***

The Tallahassee-Leon County Comprehensive Plan (Comp Plan) currently includes the following Objectives:

#### ***SANITARY SEWER LOS***

***Objective 1.3: [SS] (Leon County) (Rev. Effective 8/17/92)***

*Needed sanitary sewer facilities will be provided in a manner which promotes orderly, compact urban and cost efficient growth while optimizing the use of existing facilities.*

#### ***POTABLE WATER LOS***

***Objective 1.2: [PW] (Effective 7/16/90)***

*Needed potable water facilities will be provided in a manner which promotes orderly compact urban growth and maximizes the use of existing facilities.*

As indicated above, these objectives have been included within the Comp Plan since it was originally adopted in 1990. Compliance with these Comp Plan requirements is achieved by entering into and maintaining a Water and Sewer Agreement with the City of Tallahassee. Under this agreement, the City is assured of having the rights to extend sewer and water into the unincorporated area and therefore can justify the planning necessary to insure such facilities are available and the County has the right to monitor that planning and direct changes if any deficiencies are noted.

Prior to the enactment of the Comp Plan, the County and City had a history of Water and Sewer Agreements.

- In May, 1980, the first WSA was approved. This agreement was primarily focused on the acquisition of funding from the Federal government under the 201 program.
- In July, 1990, the County and City entered into a WSA that contained many of the same provisions used in later WSA's.

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- In February, 1993, the County and City approved a new WSA with provision intended to insure compliance with the new Comp Plan requirements.
- In May, 2005, the current WSA was approved.

The 1992/1993 WSA utilized Master Plans that were developed by the City in 1988 under the 1980 WSA. Those Master Plans served as the basis for the annual review of the City's 5 Year CIP for water and sewer until 2005.

At the time the 2005 WSA was being developed, the City was in the process of updating the 1988 Master Plans. Accordingly, the 2005 WSA provided that the City should develop the Master Plans within 18 months of execution of the 2005 WSA. The WSA was executed in May of 2005, therefore the Master Plans should have been developed by November 2006. A draft of the Sewer Master Plan was provided to County staff in early December, 2009. Staff's review noted that the Harbinwood area had not been addressed as a Target Area. City staff acknowledged the omission and modified the plan to include detailed plans for Harbinwood. The Sewer Master Plan was completed in January 2010 and approved by the City Commission in February 2010. The Water Master Plan was completed in April 2010 and approved by the City Commission in August 2010.

Upon receipt of both Master Plans, County staff began preparations for presentation to the Board for approval in September 2010. However, given the significant long term implications of these plans, it was decided to conduct a workshop once the new Board of County Commissioners was installed. Upon approval of the Master Plans, the annual review process for the City's 5 Year CIP will commence in June of the year following approval.

Other provisions of the WSA are also pertinent to the consideration of the approval of these Master Plans. Section 3 of the Agreement discusses Target Areas for water and sewer service. In this part of the agreement, the County reserved the right to identify areas to be considered with a higher priority for water and or sewer service. In summary, the City is not required to complete the construction of the collection system within a Target Area; the City agrees to provide the conveyance, connecting the collection system to the City system; and the City agrees to own, operate and maintain the system once it is built. The Agreement further provides that these arrangements will be the basis for an Implementation Agreement to be developed separately from the WSA. The three areas identified in the WSA are Woodville, Centerville Trace and the Harbinwood area between North Monroe and Lake Jackson. The County may add or delete Target Areas at its discretion.

### **2030 Master Sewer Plan Phase 2:**

The Sewer Master Plan is a large three-ring binder volume with oversize graphics. Much of the document consists of research data, calculations and other information upon which the results are based. For ease of review, the following excerpts from the SMP are attached: Executive Summary (Attachment #2); Section 1 – Introduction (Attachment #3); Section 3 – Evaluation of Unsewered Target Areas (Attachment #4) and Appendix A – Expanded Evaluation of Unsewered Areas (Attachment #5).

### **Scope of Study**

In summary, the Master Plan was developed using the following criteria:

- The geographic area was limited to the area within the USA, with an exception for the Woodville Special Development Area being included.
- The population used was the ultimate population within the entire USA, including all of the unincorporated area within the USA
- The study included 9 large unsewered areas originally identified in the 1988 plan. Detailed analysis of these areas was provided. These areas embrace a large portion of the unincorporated portion of the USA.
- All of the Target Areas identified in the WSA were given detailed evaluation as to the cost of providing sewer service to those areas, including preliminary design.
- Capacity and operational upgrades to the existing system within the City limits were to be evaluated to insure that the system will be capable of accepting the flows to be generated in the unincorporated area.

### **Evaluation of Unincorporated Area Planning**

The County's focus is on the unincorporated portion of the USA. To further evaluate the completeness of the City plan, County staff developed a separate graphic to analyze the extent to which the Plan addresses service within that area (Attachment #6). This graphic delineates the study areas of the City Master Plan on a map with the locations of septic systems indicated by dots. Also shown are the City Limits and the USA.

This graphic clearly shows that, with only a few exceptions, the entire unincorporated USA has been included in the long range plan. This confirms that the requirements of the Comp Plan are being met by the WSA.

It is noted, however, that review of the map indicates a few areas of relatively dense septic tank installations not addressed by the City's Plan. Although it is known that all of the future population within the unincorporated USA has been included in the Plan, the omission results in the cost of actually providing sewer service to the properties not established in the City's final Master Plan. This cost issue is addressed in the Budget Analysis section of this workshop presentation.

According to the City, the primary areas not addressed by the plan are in the northwest in the area generally west of Harbinwood and including the subdivisions Edinburg Estates, Autumn Estates, Sterling Woods, Lake Jackson Estates, Tower Oaks Mobile Home Park, and Oak Valley Commercial Center. This is a relatively dense development area on septic systems. Although the Master Plan accounted for the build-out population in this area, detailed planning for these areas was beyond the Master Plan scope of this phasing period. This Master Plan update focused on unsewered areas with sufficient density and growth potential. More than likely these areas will be included during the next planning period or sooner if the need arises.

Two other areas in the southeastern part of the County are also not included. These are the Avondale and Plantation Estates subdivision. As with those areas mentioned above, these areas were not included in this update, due to them not having both sufficient density and growth potential.

As noted above, the cost to address these areas is included in the budget analysis section below.

WSA Target Areas

The WSA Target Areas were developed as the next highest priority areas after the Killlearn Lakes Sewer Project. In that project, the County funded and built the collection system for Units 1 and 2 of the development utilizing a portion of the County’s Blueprint 2000 water quality funding. The County also funded the cost of the conveyance to the City system. The City agreed to own and operate the system. The three additional Target Areas have been addressed in the Master Plan, and their costs are:

<b>Table 1: WSA Target Areas</b>	
Target Area	Estimated Cost
Woodville	\$24,576,000
Centerville Trace	\$4,745,000
Harbinwood	\$12,100,830
Total	\$41,421,830

Budget Analysis

Before Budget Analysis can begin, there is a need to determine the cost of actually extending service into the omitted areas described above. Using an average cost per lot from the Plan's prior calculations, and a total number of parcels, staff determined the cost as reflected in Table 2.

<b>Table 2: Omitted Sewer Areas</b>			
Omitted Area	Cost/Lot	# Lots	Cost
Talquin Sewer Area, NW Leon County	12,000	3,687	\$44,244,000
Avondale Subdivision	12,000	187	\$2,244,000
Plantation Estates Subdivision	12,000	158	\$1,896,000
Total Additional Cost			\$48,384,000

It is to be noted all of the costs presented in the Master Plan reflect the cost to provide a sewer tap at each lot in the area. The additional cost for property owners to actually connect to the service tap is estimated at approximately \$10,000. It should also be noted that these projects are conventional gravity sewer, unlike the low pressure system installed in Killlearn Lakes.

The current 5 Year CIP includes three projects, see Table 3, having a direct positive impact on the unincorporated area and comprise almost one third of the total 5 Year CIP budgeted amount. It should be noted that these projects are not mentioned in the Master Plan except in the CIP discussion. This would be the kind of projects that will be reviewed each year as a part of the City's proposed 5 Year CIP starting that year.

These projects have been proposed for inclusion in the current 5 Year CIP for various reasons. The CCSE (Sembler) Pump Station and Force Main, for example, is a critical collection point for sewer originating in the unincorporated area. Although the collection system is not being installed at this time, the pump station and force main are being installed as a part of the Capital Circle projects being done by BluePrint 2000.

The Aenon Church trunk sewer was initiated by the City in 2008 (concurrently with the preparation of this Master Plan update) to serve new developments proposed along Aenon Church and lying within the Transfer Station Target Planning Area.

The Apalachee Parkway - Williams Road trunk sewer provides added capacity and off-site sewer service to new developments previously proposed along Apalachee Parkway from March Road to Williams Road. Multiple requests have been received by the City to serve new potential developments in this area.

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Project Description	CIP Year	Estimated Cost
Aenon Church Gravity Outfall	2011	\$621,000
CCSE (Sembler) Pump Station & Force Main	2014	\$634,000
Apalachee Parkway / Williams Road Outfall	2015	\$2,207,000
<b>Total</b>		<b>\$3,462,000</b>

The 20 Year Budget developed as a result of the technical study is summarized in Table 4. It is to be noted that the Capacity and Operational Improvements are beneficial to the unincorporated area as well as to the internal City system. Capacity improvements are upgrades to existing pipes and pumping systems to insure that future flows can be handled by the system. Operational improvements include projects that make the system more efficient (and therefore cheaper) to operate, such as installing a gravity main to replace a pump station and force main. The Capacity and Operational improvements are funded by the City in the 20 Year CIP. Also funded are the specific Projects Serving Large Unincorporated Areas discussed above. The other line items below are on hold pending a funding initiative by the County or private development.

Budget Element	Total Cost
To be funded in City 20 Year CIP:	
Capacity Related Improvements	\$9,840,000
Operational Related Improvements	\$15,353,000
Projects Serving Large Unsewered Areas	\$3,462,000
<b>Total Funded</b>	<b>\$28,655,000</b>
Unfunded Items in Master Plan	
Large Unsewered Areas (excluding County Target Areas)	\$169,877,000
County Target Areas	\$41,421,830
Talquin Service Areas	\$7,210,000
Omitted Areas	\$48,384,000
<b>Total Unfunded</b>	<b>\$266,892,830</b>
<b>Total, Funded and Unfunded</b>	<b>\$295,547,830</b>

The actual proposed 20 year budget provides that the City will actually budget \$28,655,000 towards projects identified in the Master Plan (Table 5). \$10,577,000 is included in the City's current 5 Year CIP.

<b>Table 5: Summary of CIP Expenditures</b>	
Budget Element	Total Cost
5 Year CIP - 2011-2015	\$10,577,000
Phase II - 2016-2020	\$11,913,000
Phase III - 2021-2025	\$2,110,000
Phase IV - 2026-2030	\$4,055,000
Total	\$28,655,000

Wastewater Treatment Capacity

Although the Master Plan being considered at this time focuses on the collection system, an important element of providing sewer service is that capability to provide treatment and disposal once the flows have been collected. The City is currently implementing its 2026 Master Plan for treatment facilities. Under this program, the treatment level of the facilities will be increased from secondary treatment to tertiary, significantly increasing the removal of nitrogen, etc. The treatment capacity of this facility is now 27.39 million gallons per day (MGD) while the facility currently only receives an average of 17.73 MGD. The completed facility will have a treatment capacity of 26.5 MGD but at a much higher level of treatment.

**Water Master Plan:**

The Water Master Plan is a large three-ring binder volume with oversize graphics. Much of the document consists of research data, calculations and other information upon which the results are based. For ease of review, the following excerpts from the WMP are attached: Executive Summary (Attachment #7); Section 1 – Introduction (Attachment #8); Section 5 – Projected Water Demands (Attachment #9) and Section 11 – Conclusions, Recommendations and Capital Improvement Plan (Attachment #10).

Scope of Study

In summary, the Master Plan was developed using the following criteria:

- The geographic area was limited to the area within the USA, with the exception being that the Woodville Special Development Area was included.
- The population used was the ultimate population within the entire USA, including all of the unincorporated area within the USA
- All of the Target Areas identified in the WSA were considered.
- Capacity and operational upgrades to the existing system within the City limits were to be evaluated to insure that the system will be capable of generating the flows needed to supply the unincorporated area.

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Evaluation of Unincorporated Area Planning

The study activity found that the City water system is well-positioned to meet future water needs within the USA and that it is well “looped”, requiring minimal improvements to meet future customer needs. Although the County’s focus is on the unincorporated portion of the USA, it must be noted that improvements to the water system can have positive impacts in a large geographic area. Improvements inside the City limits can provide for the needs in the adjacent unincorporated area. Two projects are of special interest to Leon County.

1. One proposed project is to enhance fire protection in the Woodville area. The City proposes to extend larger mains to the Woodville area to enhance fire protection. This project is funded in the year 2012 in the proposed 20 Year CIP.
2. The other project is associated with fire protection at the western end of the City system on Highway 90 West. The project proposes to extend that water system down Barineau Road to Highway 20, and then along Highway 20 back to the City system, creating a looped system in that area. This project is funded in the year 2025 in the proposed 20 Year CIP.

Water Supply Capacity

The City’s existing Consumptive Use Permit establishes the following permitted capacities:

- Combined average annual withdrawal of 33.7 MGD
- Maximum combined withdrawal of 59.3 gallon during a single day
- Combined monthly withdrawal of 1,415,400,000 gallons.

The average day water demand for the system since 2000 has varied from 28.46 to 33.10 MGD.

The City will be renewing its Consumptive Use Permit in 2011. Two new water supply wells are proposed in the 20 Year CIP, and the wells have been targeted as needed by the year 2020.

Budget Analysis

The Master Plan resulted in the City’s planning to spend \$36,500,000 over the next 20 years on the water system. \$10,250,000 of that is budgeted in the City’s current 5 Year CIP. The 20 Year CIP is summarized in Table 6 (note that the first column is the current 5Year CIP):

**Table 6: City’s 20 Year CIP’s for the Water System.**

Project Element	2011-15	2016-20	2021-25	2026-30	Total
Operational Improvements	\$10,250,000	\$6,700,000	\$5,220,000	\$500,000	\$22,670,000
Capacity Improvements	\$1,000,000	\$1,500,000	\$1,100,000	\$6,000,000	\$9,600,000
Areas of Concern / Fire Flow Imp	\$0	\$1,400,000	\$1,890,000	\$950,000	\$4,240,000
Total	\$11,250,000	\$9,600,000	\$8,210,000	\$7,450,000	\$36,510,000

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The scheduled funding of the two projects of interest to Leon County are summarized in Table 7:

**Table 7: Projects of Interest**

Project Element	2011-15	2016-20	2021-25	2026-30	Total
Highway 90 West Fire Flow Imp	\$640,000	\$0	\$0	\$0	\$640,000
Woodville Fire Flow Imp	\$0	\$0	\$1,700,000	\$0	\$1,700,000
Total	\$640,000	\$0	\$1,700,000	\$0	\$2,340,000

WSA Target Areas

There are no Target Areas in the WSA that address water service. Currently, there are no Target Areas that have identified water supply as a problem. The Plan did evaluate the three Target Area projects in the WSA and have confirmed that adequate flows are available and that any water supply needs in those areas can be easily met.

Long Term Funding

With the exceptions noted, the Water and Sewer Master plans have been developed consistent with the requirements of the interlocal agreement with the intention of providing needed service to the appropriate portions of the entire County. The City is committed to provide \$28.6 million of the total \$295.5 needed for the Sewer System; the Master plans indicated all of the Water needs will be included as funded capital projects over the next 20 years.

In order to continue with the necessary development of the sewer system which could eliminate the existing septic tanks for the vast majority of the USA, it is recommended that the projects identified in the respective Sewer Master plans, as well as the additional projects identified by County staff, be included in any one cent infrastructure sales tax extension referendum.

The inclusion of these projects will provide for environmental protection, economic development and improving the needs of some of our most economically challenged neighborhoods.

The existing sales tax expires in 2019. The Board of County Commissioners will have to determine when is the appropriate time to seek an extension to the existing sales tax.

Currently through the interlocal agreement and with statutory authority, the City is charging a 50% surcharge on unincorporated water and sewer customers. If the sales tax initiative is pursued, it is recommended that the water and sewer rates for all Leon County residents be equalized.

**Options:**

1. Approve the City of Tallahassee's 2030 Master Sewer Plan Phase 2 dated January, 2010.
2. Approve the City of Tallahassee's Water Master Plan dated April, 2010.
3. Authorize that the projects identified in the Sewer Master plan, as well as the additional projects identified by staff, be included in any one cent infrastructure sales tax extension referendum.
4. Authorize that when funded by the sales tax extension, equal water and sewer rates would apply for all customers within Leon County inclusive of any surcharges.
5. Do not Approve the City of Tallahassee's 2030 Master Sewer Plan Phase 2 dated January, 2010.
6. Do not approve the City of Tallahassee's Water Master Plan dated April, 2010.
7. Board Direction.

**Recommendation:**

Options #1, #2, #3 and #4.

**Attachments:**

1. Water and Sewer Agreement
2. Sewer Master Plan Executive Summary
3. Sewer Master Plan Section 1 – Introduction
4. Sewer Master Plan Section 3 – Evaluation of Unsewered Target Areas
5. Sewer Master Plan Appendix A – Expanded Evaluation of Unsewered Areas
6. Map
7. Water Master Plan Executive Summary
8. Water Master Plan Section 1 – Introduction
9. Water Master Plan Section 5 – Projected Water Demands
10. Water Master Plan Section 11 – Conclusions, Recommendations and Capital Improvement Plan

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**WATER AND SEWER AGREEMENT**

**THIS AGREEMENT**, made and entered into this 10th day of May, 2005, by and between the CITY OF TALLAHASSEE, a Florida municipal corporation (hereinafter referred to as "City"), and LEON COUNTY, a political subdivision of the State of Florida (hereinafter referred to as "County").

**WITNESSETH**

**WHEREAS**, the County has determined that it will be the sole local governmental entity to authorize the planning, construction and operation of water systems and sewage disposal systems within the unincorporated area of the County and will provide such services when it deems it appropriate; and

**WHEREAS**, the County has specifically determined that it is in the best interest of the citizens of the County if the City is granted an exclusive water and sewer franchise to serve all of that part of the County that is not currently served by other water and sewer providers, with conditions thereon; and

**WHEREAS**, the City, by accepting an exclusive water and sewer franchise pursuant to this Agreement, does not waive or relinquish any rights to which it is entitled under Florida Statutes, Chapter 180; and

**WHEREAS**, the County recognizes that, until such time as the City has its countywide system in place, there are areas of the County that cannot reasonably, efficiently and economically be served by the City and that other water and sewer providers may be able to provide the necessary service and, accordingly, upon notice from the City that the City cannot serve the area, the County will revoke the City's exclusive franchise for any specific geographic area and grant a franchise to another water and/or sewer provider so that the needs of the citizens of the County will be met.

**NOW, THEREFORE**, in consideration of the following mutual promises and covenants, and other good and valuable consideration the sufficiency of which is being acknowledged, the City and County hereby agree as follows:

**Section 1. Term.** The Term of this Agreement shall commence upon full execution hereof and shall continue until September 30, 2030, unless earlier terminated pursuant to the terms of this Agreement. This Agreement shall be extended automatically for an unlimited number of additional five (5) year periods unless written notice is provided by either party at least twenty-four (24) months prior to the end of the original or any extended agreement period.

**Section 2. Franchise.**

a. The County does hereby grant unto the City, and the City hereby accepts, an exclusive franchise to provide water service to all properties located within the County that are not located within an existing or applied for water franchise area at the time this Agreement becomes effective. Exhibit A identifies all existing water and sewer utility franchise areas at the

time of execution of this Agreement and is attached hereto and incorporated as if fully set forth herein. Further, the County does hereby grant unto the City, and the City does hereby accept, an exclusive franchise to provide sewer service to all properties located within the County that are not located within an existing or applied for sewer franchise at the time this Agreement becomes effective. Both the sewer and water service franchises granted herein shall be subject to and contingent upon the terms and conditions contained in this Agreement.

b. Portions of the sewer franchise granted herein are subject to the Tallahassee-Leon County Comprehensive Plan restrictions prohibiting the installation of municipal sewers. The City shall not be obligated to provide service in these areas until such time as amendments are made to the Tallahassee-Leon County Comprehensive Plan, which shall have the effect of partially or completely removing those restrictions.

### Section 3. Target Water and Sewer Service Areas.

a. The City and County agree that, within the franchise area granted herein there are specific geographic areas, the Woodville Community, Centerville Trace Subdivision and Harbinwood Subdivisions, hereinafter referred to as Target Areas. It is agreed that these Target Areas are in need of water and/or sewer service due to the lack of proper utilities or the failure of utilities on which they were developed and that these Target Areas will be prioritized for the provision of water and/or sewer services.

b. Target Areas have been identified by the City and County and are attached hereto and incorporated as if fully set forth herein as Exhibit A. Target Areas will be updated annually by the County no later than December 1 of the preceding fiscal year prior to anticipated action by the City.

c. The City and County agree that, at the time that a Target Area is to be provided with water and/or sewer service by others, the City and County will enter into a Target Area Implementation Agreement. Said Implementation Agreement will specify the rights and responsibilities of each party in the provision of the utility service to the Target Area and the terms and conditions of service. The County agrees that the City is not obligated to participate in the development and construction of the water distribution or sewer collection system within the Target Area. The City agrees to provide some or all of the conveyance to or from the Target Area subject to the Implementation Agreement.

d. The City agrees that it will maintain or plan for treatment and disposal capacity to serve the identified Target Areas.

### Section 4. Rights and responsibilities of City.

a. The City is responsible for providing water and/or sewer service to all properties located within the franchise area except as provided in this Agreement. City water and/or sewer service to existing developed properties within the franchise area shall be determined on the basis of a site specific evaluation by the City that includes cost feasibility, availability of easements, and other pertinent factors in a manner similar to that used within the City limits.

b. All City policies, standards, procedures, regulations, rates, fees, and charges for water and sewer services shall be the same, inside and outside City 's corporate limits, with the exception of the rebate policy, and as provided herein. City shall have the exclusive right to manage and operate its water and sewer system in the unincorporated area except as limited by this Agreement.

c. The City may assess a surcharge of up to 50% on water and/or sewer services in accordance with Florida Statutes commencing no sooner than October 1, 2005. Upon termination of the Parks and Recreation Agreement entered into by and between the parties on May 10, 2005 the provisions of this Section 4. paragraph c. shall expire.

d. The City shall not require annexation into the City as a condition for providing water and/or sewer service to any property in the franchise area.

e. The City's rights to require connection of existing properties shall be as prescribed in applicable statutes and codes. This agreement does not add to or detract from those rights.

#### Section 5. Annual Review of Long Range Master Plan.

a. The City shall, within 18 months of the effective date of this agreement, develop and maintain a long range master plan for the provision of water and sewer service within the franchise area granted herein. Said master plans shall be approved by the County and shall be updated and submitted for County approval every five years.

b. The County shall have the right to provide input to the City's budget process concerning priorities for water and sewer projects in the County. Such input shall be provided no later than December 1 of the preceding fiscal year. The City shall submit no later than June 1 the proposed City five-year capital improvement plan (CIP) for water and sewer projects in the County for annual review and approval by the County. City shall submit no later than October 20 to the County the final approved City CIP for water and sewer projects in the County. The CIP shall be based upon the approved long range master plans described above.

#### Section 6. Determination of City Sewer Service Availability for New Development

a. City sewer service shall be considered available to new developments which require site and development plan approval or issuance of a development order if it is capable of being connected to by the plumbing of a development, establishment or residence which has adequate permitted capacity to accept the sewage to be generated by the development, establishment or residence; and

1. All references to lots in this section are to developments having an average lot size of 2 acres in area or less.

2. For a new development on an existing parcel which has an estimated sewage flow of 1,000 gallons per day or less, a gravity sewer line to maintain gravity

flow from the property's drain to the sewer line, or a low pressure or vacuum sewage collection line in those areas approved for low pressure or vacuum sewage collection exists in a public easement or right-of-way within 100 feet of the property line of the lot, residence, or establishment.

3. For a new development on an existing parcel which has an estimated sewage flow exceeding 1,000 gallons per day, a point of connection to a sewer line exists in a public easement or right-of-way that abuts the property of the establishment or is within 400 feet of the property line of the establishment as accessed via existing rights-of-way or easements.

4. For residential subdivisions with 10 lots or less, and for commercial subdivisions with less than 5 lots, a point of connection to a sewer line exists within 400 feet of the development as measured and accessed via existing easements or rights-of-way.

5. For residential subdivisions with 11-20 lots, a point of connection to a sewer main exists within 800 feet of the development as measured and accessed via existing easements and rights-of-way.

6. For residential subdivisions with greater than 20 lots and for commercial subdivisions with 5 or more lots, a point of connection to a sewer main exists within 1200 feet of the development as measured and accessed via existing easements and rights-of-way.

b. The determination of availability of sewer for any new development shall be made based upon existing conditions at the time of the first Site Development Plan review meeting, as defined under Chapter 10, Leon County Code of Laws, except that the City reserves the right to extend its sewer system at its cost to make sewer available in accordance with the availability criteria set forth herein to existing and developing parcels within six months after the issuance of a site plan approval or development order as may be applicable to the new development.

c. When the City sewer system is available within the respective distances specified above, the property owner will be responsible for extending to the sewer main the remaining distance to their property and also for installing any on-site sewer collection system.

d. If the City Manager and the County Administrator or their designees agree that the connection of a development to City sewer is not economically feasible, regardless of the criteria defined herein, said service shall be determined to be not available.

e. The City reserves the right to develop agreements with property owners and developers to make service available within time frames and at locations that vary from these criteria subject to mutual agreement between City and developer.

**Section 7. Determination of City Water Service Availability for New Development**

a. City water service shall be considered available to new developments which require site and development plan approval or issuance of a development order if it is capable of being connected to the plumbing of a development, establishment or residence and has adequate permitted capacity and pressure to supply water to the development, establishment or residence; and

1. All references to lots in this section are to developments having an average lot size of 2 acres in area or less.

2. For a new development on an existing parcel a water main exists in a public easement or right-of-way within 200 feet of the property line of the lot, residence, or establishment.

3. For residential subdivisions with 10 lots or less, and for commercial subdivisions with less than 5 lots, a point of connection to a water line exists within 400 feet of the development as measured and accessed via existing easements or rights-of-way.

4. For residential subdivisions with 11-20 lots, a point of connection to a water main exists within 800 feet of the development as measured and accessed via existing easements and rights-of-way.

5. For residential subdivisions with 20 or more lots, for commercial subdivisions with 5 lots or more, a water system exists within 1200 feet of the development as measured and accessed via existing easements or rights-of-way.

b. The determination of availability of water for any new development shall be made based upon existing conditions at the time of the first Site Development Plan review meeting, as defined under Chapter 10, Leon County Code of Laws, except that the City reserves the right to extend its water system at its cost to make water available in accordance with the availability criteria set forth herein to existing and developing parcels within six months after the issuance of a site plan approval or development order as may be applicable to the new development.

c. When the City water system is available within the respective distances specified above, the property owner will be responsible for extending the water main the remaining distance to their property and also for installing any on-site water distribution system.

d. If the City Manager and the County Administrator or their designees agree that the connection of a development to City water is not economically feasible, regardless of the criteria defined herein, said service shall be determined to be not available.

e. The City reserves the right to develop agreements with property owners and developers to make service available within time frames and at locations that vary from these criteria subject to mutual agreement between City and developer.

**Section 8. When City Service is not Available for New Development**

a. City shall provide written notification to the County and the property owner within 14 days after the first formal review of the proposed site plan. Said notification shall advise whether service is or is not available, and shall describe the conditions which qualify it as being available. Upon notification that service is not available, property owner shall be allowed to install potable water wells and/or septic sewage systems in accordance with applicable County Codes of Law, or to seek services from another water and/or sewer service provider.

b. If City Service is not available as per notification received by the County described in Paragraph a above, County may, in accordance with Leon County Code and the provisions of this agreement, revoke the franchise for the geographic area in question and grant water and/or sewer franchises to other providers.

**Section 9. Standards for Construction and Operation.**

a. The City water and sewer construction standards, as they exist or may be modified, shall apply to all City water and sewer franchise area.

b. Standards for the design and construction of water and sewer systems by providers other than City shall be at least equal to those of City. Such standards for water systems shall include minimum requirements for water main sizes, fire hydrant distribution, and flow capacities to provide adequate fire protection.

c. State and Federal regulations relative to the construction and operation of water and sewer facilities shall be adhered to by all utility providers in Leon County.

d. County standards and permit procedures must be adhered to by City and all franchise holders for any water and/or sewer construction that impacts County maintained facilities such as roads or drainage facilities.

**Section 10. Termination.** If either Party fails to comply with any of the terms or conditions of this Agreement or defaults in any of its obligations under this Agreement and shall fail, within ninety (90) calendar days after written notice from the other Party, to correct such default or noncompliance, the non-defaulting Party may, at its option, forthwith terminate this Agreement after Section 11 provisions have been complied with. Upon termination, geographic areas physically served shall be converted into specific water and/or sewer franchises.

**Section 11. Dispute Resolution.**

a. The Parties shall attempt to resolve any disputes that arise under this Agreement in good faith and in accordance with this Section. The provisions of the "Florida Governmental

Conflict Resolution Act" shall not apply to disputes under this Agreement, as an alternative dispute resolution process, is hereby encompassed within Section 11. The aggrieved Party shall give written notice to the other Party, setting forth the nature of the dispute, date of occurrence (if known), and proposed resolution, hereinafter referred to as the "Dispute Notice".

b. The appropriate City and County department heads shall meet at the earliest opportunity, but in any event within 10 days from the date the Dispute Notice is received, to discuss and resolve the dispute. If the dispute is resolved to the mutual satisfaction of both, the department heads shall report their decision, in writing, to the City Manager and the County Administrator.

c. If the department heads are unable to reconcile the dispute, they shall report their impasse to the City Manager and the County Administrator who shall then communicate at their earliest opportunity regarding the dispute, but in any event within 20 days following receipt of the Dispute Notice, to attempt to reconcile the dispute.

d. If a dispute is not resolved by the foregoing steps within thirty (30) days after receipt of the Dispute Notice, unless such time is extended by mutual agreement of the Parties, then either Party may require the dispute to be submitted to mediation by delivering written notice thereof (the "Mediation Notice") to the other Party. The mediator shall meet the qualifications set forth in Rule 10.100(c), Florida Rules for Mediators, and shall be selected by the Parties within 10 days following receipt of the Mediation Notice. If agreement on a mediator cannot be reached in that 10-day period, then either Party can request that a mediator be selected by an independent conflict resolution organization, and such selection shall be binding on the Parties. The costs of the mediator shall be borne equally by the Parties.

e. If an amicable resolution of a dispute has not been reached within 60 calendar days following selection of the mediator, or by such later date as may be mutually agreed upon by the Parties, then such dispute may be referred to binding arbitration by either Party. Such arbitration shall be conducted in accordance with the Florida Arbitration Code (Chapter 682, Florida Statutes).

f. Such arbitration shall be initiated by delivery, from one Party (the "Claimant") to the other (the "Respondent"), of a written demand therefor containing a statement of the nature of the dispute and the amount, if any, involved. The Respondent, within ten (10) days following its receipt of such demand, shall deliver an answering statement to the Claimant. After the delivery of such statements, either Party may make new or different claims by providing the other with written notice thereof specifying the nature of such claims and the amount, if any, involved.

g. Within ten (10) days following the delivery of such demand, each Party shall select an arbitrator and shall deliver written notice of that selection to the other. If either Party fails to select an arbitrator within such time, the other Party may make application to the court for such appointment in accordance with the Florida Arbitration Code. Within ten (10) days following delivery of the last of such written notices, the two arbitrators so selected shall confer

and shall select a third arbitrator. Each of the arbitrators so appointed shall have experience in local government and/or utility issues.

The arbitration hearing shall be commenced in Leon County, Florida within sixty (60) days following selection of the third arbitrator. Except as may be specifically provided herein, the arbitration shall be conducted in accordance with Rules R-23 – R-48, of the Commercial Arbitration Rules of the American Arbitration Association.

#### Section 12. Indemnification

To the extent permitted by law and subject to the limitations, conditions, and requirements of Section 768.28, Florida Statutes, which the Parties do not waive, each Party agrees to indemnify, defend and hold harmless the other Party, their officials, officers, and employees, from and against all liabilities, damages, costs and expenses, resulting from or arising out of any acts or omissions by the indemnifying Party, or its officials, officers, or employees, relating in any way to this Agreement.

#### Section 13. General Provisions.

a. Governing Law and Venue. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. Any action to enforce any of the provisions of this Agreement must be maintained in Tallahassee, Leon County, Florida.

b. Waiver. Failure to insist upon strict compliance with any term, covenant or condition of this Agreement shall not be deemed a waiver of it. No waiver or relinquishment of a right or power under this Agreement shall be deemed a waiver of that right or power at any other time.

c. Modification. This Agreement shall not be extended, changed or modified, except in writing duly executed by the Parties hereto.

d. Binding Effect. This Agreement shall be binding upon the successors and, subject to below, assigns of the Parties hereto.

e. Assignment. Because of the unique nature of the relationship between the Parties and the terms of this Agreement, neither Party hereto shall have the right to assign this Agreement or any of its rights or responsibilities hereunder to any third Party without the express written consent of the other Party to this Agreement, which consent shall not unreasonably be withheld.

f. Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to the matters contained herein, and all prior agreements or arrangements between them with respect to such matters are superceded by this Agreement.

g. Headings. Headings in this Agreement are for convenience only and shall not be used to interpret or construe its provisions.

h. Ambiguity. This Agreement has been negotiated by the Parties with the advice of counsel and, in the event of an ambiguity herein, such ambiguity shall not be construed against any Party as the author hereof.

i. Public Bodies. It is expressly understood between the Parties that the City is a duly incorporated municipal corporation of the State of Florida and that the County is a political subdivision of the State of Florida. Nothing contained herein shall be construed as a waiver or relinquishment by either of the Parties to claim such exemptions, privileges or immunities as may be provided to that Party by law.

j. Force Majeure. A Party shall be excused from performance of an obligation under this Agreement to the extent, and only to the extent, that such performance is affected by a "Force Majeure Event" which term shall mean any cause beyond the reasonable control of the Party affected, except where such Party could have reasonably foreseen and reasonably avoided the occurrence, which materially and adversely affects the performance by such Party of its obligation under this Agreement. Such events shall include, but not be limited to, an act of God, disturbance, hostility, war, or revolution; strike or lockout; epidemic; accident; fire; storm, flood, or other unusually severe weather or act of nature; or any requirements of law.

k. Cost(s) and Attorney Fees. In the event of litigation between the Parties to construe or enforce the terms of this Agreement or otherwise arising out of this Agreement, the prevailing Party in such litigation shall be entitled to recover from the other Party its reasonable costs and attorneys fees incurred in maintaining or defending subject litigation. The term litigation shall include appellate proceedings.

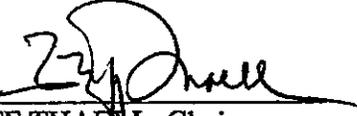
l. Severability. It is intended that each Section of this Agreement shall be viewed as separate and divisible, and in the event that any Section, or Party thereof, shall be held to be invalid, the remaining Sections and parts shall continue to be in full force and effect.

m. Subject to Appropriation. All payment obligations of the Parties as set forth herein shall be subject to appropriation of funding therefore by the applicable legislative bodies; however, failure to appropriate funding adequate to meet such payment obligations shall be dealt with as a dispute under this Agreement.

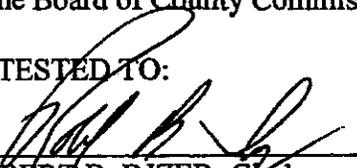
n. Exceptions to Agreement. All provisions of Chapter 18, of the Leon County Code of Laws, not in conflict with the provisions herein, shall remain in full force and effect. All provisions of the City of Tallahassee Code, particularly Chapter 21 not in conflict with the provisions herein, shall remain in full force and effect. The Water and Sewer Agreement entered into by and between Leon County and the City February 11, 1993 shall be cancelled as of the effective date of this agreement and shall have no effect upon the terms and conditions of this Agreement, nor the Franchise granted herein.

IN WITNESS WHEREOF, the Parties hereto, through their duly authorized representative, have executed this Water and Sewer Agreement as of the date first written above.

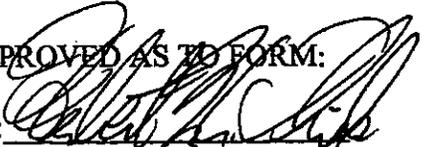
LEON COUNTY, FLORIDA

By:   
CLIFF THAEL, Chairman  
of the Board of County Commissioners

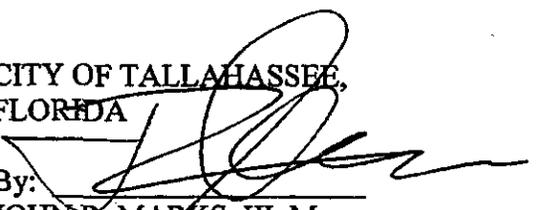
ATTESTED TO:

By:   
ROBERT B. INZER, Clerk  
Leon County, Florida

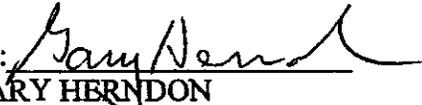
APPROVED AS TO FORM:

By:   
HERBERT W.A. THIELE, Esq.  
COUNTY ATTORNEY

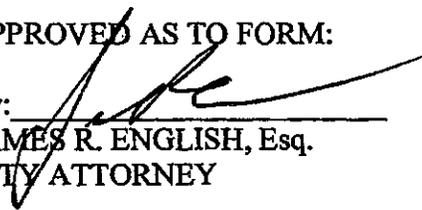
CITY OF TALLAHASSEE,  
FLORIDA

By:   
JOHN R. MARKS, III, Mayor  
of the City of Tallahassee

ATTESTED TO:

By:   
GARY HERNDON  
City Treasurer-Clerk

APPROVED AS TO FORM:

By:   
JAMES R. ENGLISH, Esq.  
CITY ATTORNEY

## Introduction

This report presents the City of Tallahassee *Sanitary Sewer System Master Plan - Phase 2*. The report describes the review and analyses conducted by Hatch Mott MacDonald (HMM), on the City of Tallahassee's trunk sewer system model. This phase of the project expanded the City's *InfoSWMM* model (developed in Phase 1) to include future piping, infrastructure, and projected wastewater flows through the year 2030; provide hydraulic and capacity analysis observations; and recommend improvements for a 20-year Capital Improvements Program.

HMM's scope of work for this project included the following:

- Update the 2005 Trunk System Model (developed in Phase 1) to include improvements made to the system through August 2008, including 1:1 match with the City's GIS.
- Develop population and wastewater flow projections through 2030 for the existing Urban Service Area (USA), using 100 gallons per capita-day (gpcd) flow.
- Evaluate nine (9) Unsewered Study Areas originally identified in a 1988 Master Sewer Plan, including preliminary layout of new infrastructure; incorporate the trunk elements of these areas into the *InfoSWMM* model; project future wastewater flows based on Tallahassee-Leon County TAZ population projections; and prepare detailed project cost opinions for each Study Area.
- Modify other areas of the model based on updated GIS information provided by the City, supplement the existing conditions model with additional geometric information, perform basin boundary adjustments as required, research available codes and standards as they relate to sewer system/service area expansion, define future sewershed delineations within the existing USA, and extend the model entities to incorporate all of these areas.
- Develop future conditions flow data for both dry-weather and wet-weather flow conditions.
- Using the 2030 trunk system model, assess future conditions collection system operation.
- Prepare a Collection System Capacity Assessment Report for future conditions (included in this Project Report).
- Prepare a 20-year Capital Improvements Program (CIP).
- Prepare this Project Report to present study methodology, results of system analyses, the Collection System Capacity Assessment Report, and the CIP.
- Present and demonstrate the updated model to City staff.
- Conduct other analyses, workshops, and presentations as requested by City staff.

The scope of the master-planned system was for a conventional gravity and force main sewer system, and therefore does not plan for or rely on low-pressure sewer systems to implement solutions.

## 2008 Trunk System Model Summary

In 2008, HMM assisted City GIS staff with supplementing the City's existing GIS with sewer system improvements made through August 2008. This included pump stations, force mains, and gravity lines extracted from as-built drawings. The 2005 Trunk System Model created during Phase 1 of this Master Sewer Plan project was then expanded by importing the updated GIS geodatabase into the *InfoSWMM* Trunk System Model. The Trunk System Model consists of all City-owned pump stations and force mains, along with gravity sewers 10" and larger in diameter, except as needed to ensure connectivity between the existing gravity and force main systems.

The 2008 *InfoSWMM* model contains the following data as outlined in **Table EX-1**, below:

**TABLE EX-1: *InfoSWMM* Model Entities (2008 Trunk System Model)**

Gravity Main Diameter	Quantity	Unit	Force Main Diameter	Quantity	Unit
8 inches	153,285	Linear Feet	4 inches	29,209	Linear Feet
10 inches	255,156	Linear Feet	6 inches	107,582	Linear Feet
12 inches	168,669	Linear Feet	8 inches	87,650	Linear Feet
14 inches	3,641	Linear Feet	10 inches	16,858	Linear Feet
15 inches	120,826	Linear Feet	12 inches	67,057	Linear Feet
16 inches	2,092	Linear Feet	14 inches	21,595	Linear Feet
18 inches	54,079	Linear Feet	16 inches	10,465	Linear Feet
21 inches	47,775	Linear Feet	18 inches	9,683	Linear Feet
24 inches	30,129	Linear Feet	20 inches	8,529	Linear Feet
27 inches	5,306	Linear Feet	24 inches	47,657	Linear Feet
30 inches	21,576	Linear Feet	30 inches	26,935	Linear Feet
36 inches	48,798	Linear Feet	36 inches	11,430	Linear Feet
42 inches	16,079	Linear Feet	42 inches	47,831	Linear Feet
			48 inches	1,179	Linear Feet
			60 inches	38	Linear Feet
<b>TOTALS:</b>		927,411 Linear Feet			493,698 Linear Feet

Model Entity	Quantity	Unit
Pump Stations	103	Each
Manholes	4,295	Each
Flow Control Valves	1	Each
Diversion Structure	1	Each
Treatment Plants	2	Each

An illustration of the Overall 2008 Trunk System Model is shown in **Figure 1**.

## Urban Service Area Population Projections

HMM and the City collaborated early in the project and established the Phase 2 Master Sewer Plan service area as the current limits of the existing USA. In October 2008, HMM received a database file from the Tallahassee – Leon County Planning Department with 2003, 2015, and 2030 population projections. These population projections were categorized according to Traffic Analysis Zone (TAZ) boundaries, and included all of Leon County. HMM used linear interpolation to estimate TAZ populations for years 2005, 2008, 2010, 2020, and 2025, and estimated the USA population for each planning year. **Figure 2** shows the USA boundary map with TAZ boundaries.

These population projections were next multiplied by 100 gpcd to estimate the total wastewater flow for each planning year. **Table EX-2** summarizes the population and flow projections through 2030 for the USA and Leon County:

**Table EX-2: Population & Wastewater Flow Projections by TAZ**

	TAZs in USA		TOTAL TAZs in USA		TAZs not in USA (n)	TOTAL LEON CO. TAZs
	100% (n)	Portion (n)				
	635	57	692		68	760
YEAR	POPULATION		EST. USA POPULATION	EST. USA FLOW (MGD) *	POP. NOT IN USA	TOTAL LEON CO. POP.
2003	208761	17199	225960	22.60	33057	259017
2005	215587	17842	233430	23.34	33935	267364
2008	225827	18807	244634	24.46	35252	279886
2010	232653	19450	252103	25.21	36130	288233
2015	249719	21058	270777	27.08	38325	309102
2020	263265	22284	285548	28.55	40650	326198
2025	276810	23510	300320	30.03	42974	343294
2030	290356	24735	315092	31.51	45298	360390

\* At 100 gallons per capita-day

## Unsewered Area Evaluation Summary

As part of this project, HMM completed an analysis of nine (9) Unsewered Target Areas, which were identified as part of a 1988 Master Sewer Plan. HMM personnel studied each area to verify the general topography, the extent of existing development, and the proximity to existing sanitary sewer system infrastructure, from which new infrastructure would be extended to serve each respective area.

Wastewater flows from each unsewered area were estimated using TAZ population data and 100 gpcd, as described above. **Table 3-1** contains a summary of the population and flow projections for each area through 2030.

HMM then completed opinions of probable project cost for infrastructure construction in each area. The unit and lump-sum prices incorporated into these construction cost opinions were taken from recent contractors' bids for similar work items; a 20% construction contingency and estimated engineering cost of 10% were likewise included in each opinion of probable cost. From these values, the total project cost and an average cost per sanitary sewer connection were computed as shown (see **Tables 3-2a & 3-2b**).

**Figure 3** illustrates the boundaries of these Unsewered Target Areas, and summarizes the cost, population and flow statistics associated with each. A copy of HMM's report for the Unsewered Target Areas is included in **Appendix A**.

## Other Franchise and Unsewered Areas Evaluation Summary

In order to identify the other areas within the existing USA which are currently unsewered, HMM created an ArcGIS map which identifies locations of existing septic tanks (see **Figure 4**). These septic tank locations were extracted from Tallahassee-Leon County GIS information. The boundaries of the nine (9) Unsewered Target Areas were added to the map, as were the boundaries of four (4) existing franchise areas served by the Talquin Electric Cooperative (TEC).

In order to estimate the wastewater flows from each of the four TEC franchise areas for this Master Plan, HMM utilized the same population and flow projection methodology described previously. These values are summarized in **Table 4-1**. Current permitted and actual flow information for each WWTP was obtained by HMM from FDEP. All 2030 projected wastewater flow from the four TEC franchise areas has been incorporated into the 2030 Trunk System Model.



**TABLE 3-1: UNSEWERED AREAS POPULATION & FLOW PROJECTIONS**

YEAR	UNSEWERED AREA POPULATION									UNSEWERED AREA TOTAL POPULATION	TOTAL EST. FLOWS (gpd) *	INCREMENTAL FLOW INCREASE (gpd) *
	Killearn Acres (Area 1)	Buck Lake/ Lafayette Oaks/ Mahan (Area 2)	Lake Jackson (Area 3)	Huntington Estates (Area 4)	Lake Munson/ Four Points (Area 5)	Woodville (Area 6) †	Bobbin Mill/ Brooke (Area 7)	Centerville Trace (Area 8)	Rose Hill (Area 9)			
2008	5,066	5,094	4,205	2,833	6,417	2,884	2,337	1,230	301	30,367	3,036,747	-
2010	5,082	5,211	4,275	3,118	6,683	2,938	2,375	1,271	309	31,263	3,126,259	89,511
2015	5,119	5,503	4,448	3,831	7,348	3,075	2,470	1,375	331	33,500	3,350,036	223,778
2020	5,171	5,700	4,578	4,195	7,692	3,156	2,607	1,528	361	34,989	3,498,920	148,884
2025	5,223	5,897	4,708	4,560	8,035	3,238	2,745	1,681	391	36,478	3,647,804	148,884
2030	5,274	6,094	4,838	4,924	8,379	3,320	2,882	1,835	421	37,967	3,796,687	148,884

20-Year Population Growth (2010 to 2030): 21.4%

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 3-2a: UNSEWERED AREAS SEWER CONNECTION STATISTICS**

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
1. Killlearn Acres	\$20,354,370	1,602	\$12,710	508,159
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
7. Bobbin Mill/Brooke	\$13,072,610	837	\$15,620	237,525
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 3-2b: UNSEWERED AREAS SEWER CONNECTION STATISTICS**  
 (sorted in ascending order by "Average Cost per Connection")

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
1. Killlearn Acres	\$20,354,370	1,602	\$12,710	508,159
7. Bobbin Mill/Brooke	\$13,072,610	837	\$15,620	237,525
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 4-1: TALQUIN ELECTRIC COOPERATIVE SERVICE AREA POPULATION & FLOW PROJECTIONS**

YEAR	TALQUIN ELECTRIC COOPERATIVE BASIN								POPULATION TOTALS	TOTAL EST. FLOWS (gpd) *	INCREMENTAL FLOW INCREASE (gpd) *
	K1 (Sandstone Ranch) 0.0707 Mgd/0.049 Mgd †		K2 (Lake Jackson) 0.500 Mgd/0.268 Mgd †		K3 (Killearn Lakes) 0.700 Mgd/0.44 Mgd †		K4 (Meadows at Woodrun) 0.098 Mgd/0.051 Mgd †				
	Population	Flow (gpd) *	Population	Flow *	Population	Flow *	Population	Flow *			
2003	1,082	108,151	6,797	679,718	5,380	538,009	1,752	175,221	15,011	1,501,099	-
2005	1,086	108,644	7,102	710,185	5,400	539,977	1,768	176,771	15,356	1,535,577	34,478
2008	1,094	109,383	7,559	755,885	5,429	542,929	1,791	179,096	15,873	1,587,294	51,717
2010	1,099	109,876	7,864	786,352	5,449	544,898	1,806	180,646	16,218	1,621,772	34,478
2015	1,111	111,109	8,625	862,520	5,498	549,818	1,845	184,520	17,080	1,707,967	86,195
2020	1,131	113,119	8,889	888,938	5,582	558,205	1,913	191,279	17,515	1,751,541	43,574
2025	1,151	115,128	9,154	915,356	5,666	566,593	1,980	198,037	17,951	1,795,115	43,574
2030	1,171	117,138	9,418	941,774	5,750	574,981	2,048	204,796	18,387	1,838,688	43,574

\* At 100 gallons per capita-day (as per HMM scope of work)

† Existing WWTP permitted capacity/most recently reported ADF

In order to ensure flow from other unsewered areas was included in the overall 2030 Master Plan, HMM and the City worked jointly to adjust and expand the 2008 Trunk System Model sewershed basin boundaries shown in **Figure 1**, to include the entire USA. These new basin demarcations subdivide the entire USA into discrete sewersheds, most of which will be served by an existing master pump station. **Figure 5** shows the Trunk System boundaries which have been established to serve the entire USA. Trunk System population demographics and flow projections are likewise included thereon.

## 2030 Trunk System Model Summary

The 2008 *InfoSWMM* Trunk System Model was expanded to serve the entire present-day USA. Gravity and force main system extensions were added to the model with assistance from City staff. New pump stations were modeled as constant-flow stations; the design flow for each new pump station was assumed to be the anticipated peak flow to each station, based on direct service area population and peak inflow from upstream pump stations. Pump station basin peaking factors were computed based on population, via Figure 1 in *Recommended Standards for Wastewater Facilities* (“10-States’ Standards”).

The 2030 *InfoSWMM* model contains the following data as outlined in **Table EX-3**, below:

**TABLE EX-3: *InfoSWMM* Model Entities (2030 Trunk System Model)**

<b>Gravity Main Diameter</b>	<b>Quantity</b>	<b>Unit</b>	<b>Force Main Diameter</b>	<b>Quantity</b>	<b>Unit</b>
8 inches	189,984	Linear Feet	4 inches	42,080	Linear Feet
10 inches	259,860	Linear Feet	6 inches	88,893	Linear Feet
12 inches	197,624	Linear Feet	8 inches	81,810	Linear Feet
14 inches	3,641	Linear Feet	10 inches	62,259	Linear Feet
15 inches	125,695	Linear Feet	12 inches	82,757	Linear Feet
16 inches	2,080	Linear Feet	14 inches	27,561	Linear Feet
18 inches	53,716	Linear Feet	16 inches	48,520	Linear Feet
20 inches	2,022	Linear Feet	18 inches	9,683	Linear Feet
21 inches	52,038	Linear Feet	20 inches	34,180	Linear Feet
24 inches	35,076	Linear Feet	24 inches	60,207	Linear Feet
27 inches	8,797	Linear Feet	30 inches	25,110	Linear Feet
30 inches	21,576	Linear Feet	36 inches	11,430	Linear Feet
36 inches	48,589	Linear Feet	42 inches	47,806	Linear Feet
42 inches	16,079	Linear Feet	48 inches	795	Linear Feet
Total = 1,016,777 Linear Feet			Total = 623,091 Linear Feet		

**TABLE EX-3 (cont.): *InfoSWMM* Model Entities (2030 Trunk System Model)**

<b>Model Entity</b>	<b>Quantity</b>	<b>Unit</b>
Pump Stations	107	Each
Manholes	4,465	Each
Flow Control Valves	1	Each
Diversion Structure	1	Each
Treatment Plants	2	Each

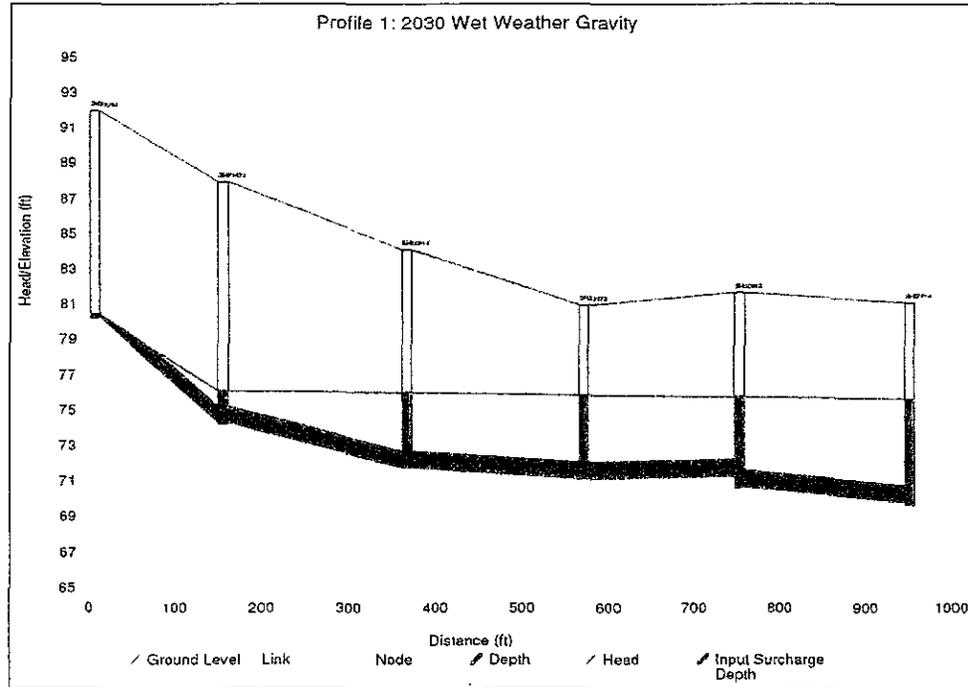
The 2030 *InfoSWMM* Trunk System Model is shown in **Figure 6**. As with the 2008 Trunk System Model, the 2030 Trunk System Model contains all force mains and pump stations, and all gravity sewers 10" diameter and larger. Several reaches of gravity sewer less than 10" diameter are likewise included where required for connectivity of the system's various components.

Once the 2030 Trunk System Model was fully established and running, HMM performed a **Capacity Assessment** of the gravity sewer system, pump stations, and sewer force main system, in order to establish a 2030 infrastructure solution set.

## Capacity Assessment Report Summary

The model's gravity sewer system capacity was analyzed on a depth-of-flow basis. Gravity sewers flowing full were considered to be at 100% capacity; profiles of those sewer reaches flowing  $\geq 100\%$  full at some point during the model run(s) were generated to verify the degree of manhole surcharging (i.e., manhole filling above highest influent or effluent pipe crown elevation), to identify potential problem areas. Additional surveying was performed by 3DS to verify critical portions of the initial 2030 gravity system model pipe reaches that were flowing full. The results of the surveying effort were incorporated into the 2030 model final solution set. There were no overflowing, or "flooding," manholes observed in the final wet-weather 2030 Trunk System Model solution set. There were 16 reaches of gravity sewers flowing full under the wet-weather scenario (see **Figure 7**). The profile comments on **Figure 7** present HMM's observations regarding each of the surcharging conditions. As the profile comments indicate, the majority of the surcharging conditions do not warrant additional analysis or concern. The reach shown in Profile 12 is slightly constricted due to larger diameter pipe upstream and downstream of the middle section; however even under 2030 wet-weather conditions, there is no flooding of manholes along this reach.

Profiles of each surcharged reach are contained in **Appendix C**, an example of which follows:



It should be noted that the surcharged conditions in the cited profiles do not necessarily occur at the same time step in the model analysis. Minor surcharging of the system and manholes without detriment to connected customers or risk of overflow is acceptable, practical and economical. These reaches should be reviewed for rehabilitation, repair or replacement in order to reduce I/I entering the system upstream of the applicable area.

Each pump station was analyzed under the dry- and wet-weather scenarios, to determine its behavior over the simulation period. This analysis included examining the following:

- Wet well level fluctuations
- Pump discharge pressure/head fluctuations
- Discharge flow rate fluctuations
- Average run, off, and daily run times
- Total gallons pumped

The following observations were made during the course of the model runs:

- Several pump stations appear to surcharge into their respective influent gravity systems by design, due primarily to shallow wet wells.
- The following pump stations were upgraded in order to accommodate the increase in flow from 2008 to 2030:
  - PS6 (Timberlane Road)
  - PS47 (Shamrock Plaza)
  - PS137 (Commerce Industrial Park)
  - PS70 (Timber Lake)
  - PS33 (Mt. Sinai Road)
- Approximately 38 of the 107 pump stations in the model appear to operate less than two hours per day under the dry-weather scenario conditions
- The operating range(s) of several pump stations could be adjusted to help increase operational efficiency:
  - PS11 (Shoreline Drive)
  - PS36 (Talquin Inn)
  - PS46 (Macon Road)
  - PS47 (Shamrock Plaza)
  - PS48 (Armistead Road)
  - PS49 (Okeeheepkee Road)
  - PS53 (Woodhaven Trailer Park)
  - PS62 (Cypress Cove)
  - PS65 (State Office Complex)
  - PS66 (Park Ave./SR 20 West)
  - PS73 (Municipal Code)
  - PS78 (Century Park)
  - PS91 (Buckwood)
  - PS96 (Timberlane School Road)
  - PS97 (Maclay Road)
  - PS99 (Southland Drive)
  - PS110 (Pecan Grove)
  - PS115 (Forest Meadows)
  - PS118 (Centre Court)
  - PS121 (Piney Z)
  - PS122 (Oven Park)

- PS148 (Kennedy Drive)
- PS 152 (Team Toyota)

**Appendices D and E** contain this capacity analysis information in graphical and textual format for each pump station, under both dry- and wet-weather scenarios, respectively.

In order to conduct a capacity analysis of the City's force main sewer system, it was necessary to establish a limiting capacity condition. The limiting condition chosen by HMM and the City of Tallahassee for this analysis was an instantaneous force main velocity of six feet per second (6 fps). Force main segments with instantaneous velocities greater than 6 fps were flagged in the model for further analysis. The vast majority of these segments had average velocities over the 24-hour model simulation of less than 6 fps. In the few cases where the average velocity did exceed 6 fps, the maximum velocity was examined. A maximum acceptable velocity of ten feet per second (10 fps) was used in this analysis.

There were 42 reaches of force main with an instantaneous velocity greater than 6 fps under the wet-weather scenario. The results are presented graphically in **Appendix F**; a map with comments on each force main's observed velocities is shown in **Figure 8**.

The following observations were made during the course of the force main analysis:

- Several of the force mains shown in **Figure 8** as having an instantaneous velocity greater than 6 fps were observed to have much lower average velocities during the dry- and wet-weather model runs.
- The 18-inch force main from PS 36 has a maximum velocity of approximately 10 fps during 2030 wet-weather model scenario when multiple pumps are running. This is the upper limit of acceptable velocity, but only occurs during peak wet-weather flow. It is recommended that the infiltration/inflow into this pump station be studied in detail and reduced where practicable.

A map of new 2030 trunk system infrastructure is shown in **Figure 9**. This solution set is a representation of the *minimum* additional trunk system components necessary to extend sanitary sewer service to the entire existing USA and the Woodville Rural Community. The solution set includes the pump stations and force mains necessary to service the 1988 Unsewered Target Areas, as well as the four (4) existing TEC franchise areas within the existing USA.

The 2030 solution set does not consider low-pressure sewer systems. These are considered by the City to be non-standard, high-maintenance, low-cost, temporary solutions which can be an impediment to the orderly expansion

of a gravity sewer system. As such, low-pressure sewer systems are not be considered for installation anywhere within the USA, as these systems are independent, not expandable, and are not typically sized to convey wastewater from adjacent abutting upland development.

## 20-Year Capital Improvements Program Summary

HMM prepared a 20-Year Capital Improvements Program through the year 2030. As per discussions with City staff over the course of the project, the following criteria were established in generating this Capital Improvements Program (CIP) for this Master Plan:

- Include capacity-related improvements based on projected population growth & deficiencies within existing service areas.
- Include service area expansion within the existing USA.
- Exclude service area expansion outside of the existing USA, with the exception of the existing Woodville Rural Community.
- Exclude rehabilitation and replacement of existing infrastructure.
- Generate a phased list of projects with input from City staff.
- Project construction cost derived from the costs in **Appendix A**.
- Design Cost = 17% of estimated Construction Cost
- All costs presented in 2009 dollars.

At the City's request, the 20-Year CIP for this project is presented in two parts.

**Table 7-1** lists the projects applicable to extending the existing trunk system to serve the entire USA by 2030. Each of these projects is described in **Section 6**.

**Table 7-2** contains a phased project implementation plan through the year 2030. As per HMM's Scope of Work for this project, the phasing plan lists improvements in one-year increments through 2015, then in five-year increments thereafter. As noted in **Table 7-2**, this phasing plan is for general guidance only, since it will be driven by both policy decisions and available funds as the City's sewer system expands.

**TABLE 7-1: USA Master Plan Projects**

FINAL JAN-2010

**Capacity Related Improvements**

Project ID	Project Description	Construction Cost	Design Cost	Estimated Capital Cost
A-06	Pump Station 47 (Tied to CCFM)	\$432,000	\$73,000	\$505,000
D-04	Pump Station 33 Upgrade	\$360,000	\$61,000	\$421,000
G-01	Pump Station 137 (Tied to CCFM)	\$940,000	\$160,000	\$1,100,000
H-01	Capital Circle West Force Main - Phase 1 (PS 73 to Hwy 90)	\$2,060,000	\$350,000	\$2,410,000
H-02	Capital Circle West Force Main - Phase 2 (TPS to PS 73)	\$3,885,000	\$660,000	\$4,545,000
H-11	Pump Station 157 Force Main Extension	\$86,000	\$15,000	\$101,000
H-13	Mission Road Gravity Sewer Upgrade	\$648,000	\$110,000	\$758,000
<b>Total Capacity Related Improvements</b>				<b>\$9,840,000</b>

**Operational Strategy Related Improvements**

Project ID	Project Description	Construction Cost	Design Cost	Estimated Capital Cost
A-01	Pump Station 89 Gravity Outfall	\$284,000	\$48,000	\$332,000
A-02	Pump Station 112 Gravity Outfall	\$313,000	\$53,000	\$366,000
A-03	Pump Station 129 Gravity Outfall	\$626,000	\$106,000	\$732,000
A-04	Pump Station 128 Gravity Outfall	\$846,000	\$144,000	\$990,000
A-05	Pump Station 85 Gravity Outfall	\$454,000	\$77,000	\$531,000
B-02	Pump Station 5 & 96 Gravity Outfall	\$447,000	\$76,000	\$523,000
D-01	Pump Station 13 Gravity Outfall	\$234,000	\$40,000	\$274,000
D-02	Pump Station 133 Gravity Outfall	\$1,089,000	\$185,000	\$1,274,000
H-03	Pump Station 160 Gravity Outfall	\$952,000	\$162,000	\$1,114,000
H-04	CCNW Pump Station and Force Main	\$1,880,000	\$320,000	\$2,200,000
H-05	Pump Station 37 Gravity Outfall & Pump Station 78 Upgrade	\$528,000	\$90,000	\$618,000
H-06	Pump Station 95 Gravity Outfall	\$383,000	\$65,000	\$448,000
H-07	Pump Station 77 Gravity Outfall	\$258,000	\$44,000	\$302,000
H-10	Capital Circle West Force Main - Phase 3 (PS Talquin2 to Hwy 90)	\$2,514,000	\$427,000	\$2,941,000
H-12	Pump Station 66 Relocation	\$364,000	\$62,000	\$426,000
I-01	Blairstone 24" Force Main Bypass	\$1,921,000	\$327,000	\$2,248,000
J-01	Pump Station 117 (Tied to CCWFM)	\$29,000	\$5,000	\$34,000
<b>Total Operational Strategy Related Improvements</b>				<b>\$15,353,000</b>

Notes:

- 1) Blue text = capacity related improvements
- 2) Red text = 1988 MSP target unsewered area related improvements.
- 3) Green text = operational strategy related improvements.
- 4) Purple text = large unsewered area related improvements.
- 5) Black text = Talquin service areas.



Sort by Project Type



Hatch Mott MacDonald

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TABLE 7-1: USA Master Plan Projects (Continued)

FINAL JAN-2010

1988 MSP Target Unsewered Area Related Improvements

Project ID	Project Description	Construction Cost	Design Cost	Estimated Capital Cost
A-07	Rose Hill			\$3,587,000
A-08	Killearn Acres			\$20,354,000
C-01	Centerville Trace			\$4,745,000
D-05	Buck Lake			\$29,734,000
H-17	Lake Jackson			\$24,453,000
H-18	Bobbin Mill			\$13,072,000
H-19	Huntington Estates			\$9,240,000
L-01	Lake Munson			\$30,615,000
N-01	Woodville			\$24,578,000
<b>Total 1988 MSP Target Unsewered Area Related Improvements</b>				<b>\$160,376,000</b>

Large Unsewered Area Improvements (Not Included in 1988 MSP Target Areas)

Project ID	Project Description	Construction Cost	Design Cost	Estimated Capital Cost
A-09	Maclean Hills			\$2,878,000
A-10	Ox Bottom			\$5,043,000
A-11	Spencer			\$2,092,000
A-12	High Grove			\$2,878,000
A-13	Velda Dairy			\$2,168,000
A-14	Rabbit Pond			\$2,127,000
B-01	Middlebrook			\$607,000
D-03	Apalachee Parkway East	\$516,000	\$88,000	\$604,000
D-06	Davis Subdivision			\$1,113,000
D-07	Tongue Hill			\$1,458,000
D-08	Windwood Hills			\$976,000
D-10	Twin Lakes Subdivision			\$1,026,000
H-08	West Tennessee Street Pump Station	\$1,229,000	\$209,000	\$1,438,000
H-09	West Jackson Bluff			\$3,829,000
H-15	Aenon Church Gravity Sewer	\$981,000	\$167,000	\$1,148,000
H-16	W. B. Rodgers Gravity Main	\$382,000	\$65,000	\$447,000
H-20	Highway 20 West			\$1,648,000
H-21	Highway 90 West			\$4,565,000
H-22	Harbinwood			\$12,100,830
I-02	Lake Bradford Road			\$2,777,000
<b>Total Large Unsewered Area Improvements</b>				<b>\$50,922,830</b>

Notes:

- 1) Blue text = capacity related improvements.
- 2) Red text = 1988 MSP target unsewered area related improvements.
- 3) Green text = operational strategy related improvements
- 4) Purple text = large unsewered area related improvements.
- 5) Black text = Talquin service areas.



Sort by Project Type



Hatch Mott MacDonald

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TABLE 7-1: USA Master Plan Projects (Continued)

FINAL JAN-2010

**Talquin Service Areas**

Project ID	Project Description	Construction Cost	Design Cost	Estimated Capital Cost
K1-01	Pump Station and Force Main to Replace Talquin WWTP	\$1,370,000	\$233,000	\$1,603,000
K2-01	Pump Station and Force Main to Replace Talquin WWTP	\$1,530,000	\$260,000	\$1,790,000
K3-01	Pump Station and Force Main to Replace Talquin WWTP	\$2,028,000	\$345,000	\$2,373,000
K4-01	Pump Station and Force Main to Replace Talquin WWTP	\$1,234,000	\$210,000	\$1,444,000
<b>Total Talquin Service Areas</b>				<b>\$7,210,000</b>

Notes:

- 1) Blue text = capacity related improvements.
- 2) Red text = 1988 MSP target unsewered area related improvements.
- 3) Green text = operational strategy related improvements.
- 4) Purple text = large unsewered area related improvements.
- 5) Black text = Talquin service areas.

**Total Estimated Capital Cost**      **\$243,701,830**



Sort by Project Type



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TABLE 7-2: USA Master Plan Phasing 2011 - 2030\*

FINAL JAN-2010

Phase I (2011 - 2015)

Year	Project ID	Project Description	Design Flow (gpm)	Construction Cost	Design Cost	Estimated Capital Cost
2011	H-01	Capital Circle West Force Main - Phase 1 (PS 73 to Hwy 90)	2,546 (16") / 4,854 (20")	\$2,060,000	\$350,000	\$2,410,000
2011	H-06	Pump Station 95 Gravity Outfall	10 (avg) / 13 (peak)	\$383,000	\$65,000	\$448,000
2011	H-07	Pump Station 77 Gravity Outfall	50 (avg) / 62 (peak)	\$258,000	\$44,000	\$302,000
2011	H-14	Aenon Church Gravity Outfall	100 (avg) / 130 (peak)	\$531,000	\$90,000	\$621,000
2012	I-01	Blairstone 24" Force Main Bypass	8,010 (avg) / 14,937 (peak)	\$1,921,000	\$327,000	\$2,248,000
2013	A-01	Pump Station 89 Gravity Outfall	45 (avg) / 82 (peak)	\$284,000	\$48,000	\$332,000
2013	D-02	Pump Station 133 Gravity Outfall	211 (avg) / 350 (peak)	\$1,089,000	\$185,000	\$1,274,000
2014	E-01	CCSE (Sembler) Pump Station & Force Main	1,569	\$542,000	\$92,000	\$634,000
2014	H-11	Pump Station 157 Force Main Extension	280	\$86,000	\$15,000	\$101,000
2015	D-09	Apalachee Pkwy / Williams Road	25 (avg) / 39 (peak)	\$1,886,000	\$321,000	\$2,207,000
<b>Phase I (2011 - 2015)</b>						<b>\$10,577,000</b>

\* Phasing plan is for general guidance only. Policy decisions, based upon available revenue and expenditures for system growth versus system operational strategy improvements, may result in significantly different capital budgets and phasing.

Year	Estimated Capital Cost
2011	\$3,781,000
2012	\$2,248,000
2013	\$1,606,000
2014	\$735,000
2015	\$2,207,000
<b>Total</b>	<b>\$10,577,000</b>

Notes:

- 1) Blue text = capacity related improvements.
- 2) Green text = operational strategy related improvements.
- 3) Purple text = large unsewered area related improvements.

TABLE 7-2: USA Master Plan Phasing 2011 - 2030 (continued)

FINAL JAN-2010

Phase II (2016 - 2020)

Year	Project ID	Project Description	Design Flow (gpm)	Construction Cost	Design Cost	Estimated Capital Cost
2016-2020	A-02	Pump Station 112 Gravity Outfall	6 (avg) / 10 (peak)	\$313,000	\$53,000	\$366,000
2016-2020	A-04	Pump Station 128 Gravity Outfall	68 (avg) / 123 (peak)	\$846,000	\$144,000	\$990,000
2016-2020	A-06	Pump Station 47 (Tied to CCFM)	1,012	\$432,000	\$73,000	\$505,000
2016-2020	B-02	Pump Station 5 & 96 Gravity Outfall	10 (avg) / 20 (peak)	\$447,000	\$76,000	\$523,000
2016-2020	D-01	Pump Station 13 Gravity Outfall	14 (avg) / 19 (peak)	\$234,000	\$40,000	\$274,000
2016-2020	G-01	Pump Station 137 (Tied to CCFM)	900	\$940,000	\$160,000	\$1,100,000
2016-2020	H-02	Capital Circle West Force Main - Phase 2 (TPS to PS 73)	6,100	\$3,885,000	\$660,000	\$4,545,000
2016-2020	H-04	CCNW Pump Station and Force Main	2,308	\$1,880,000	\$320,000	\$2,200,000
2016-2020	H-05	Pump Station 37 Gravity Outfall & Pump Station 78 Upgrade	202	\$528,000	\$90,000	\$618,000
2016-2020	H-13	Mission Road Gravity Sewer Upgrade	645 (avg) / 1,090 (peak)	\$648,000	\$110,000	\$758,000
2016-2020	J-01	Pump Station 117 (Tied to CCWFM)	385	\$29,000	\$5,000	\$34,000
<b>Phase II (2016 - 2020)</b>						<b>\$11,913,000</b>

Notes:

- 1) Blue text = capacity related improvements.
- 2) Green text = operational strategy related improvements.

TABLE 7-2: USA Master Plan Phasing 2011 - 2030 (continued)

FINAL JAN-2010

Phase III (2021- 2025)

Year	Project ID	Project Description	Design Flow (gpm)	Construction Cost	Design Cost	Estimated Capital Cost
2021-2025	A-03	Pump Station 129 Gravity Outfall	10 (avg) / 16 (peak)	\$626,000	\$106,000	\$732,000
2021-2025	A-05	Pump Station 85 Gravity Outfall	75 (avg) / 136 (peak)	\$454,000	\$77,000	\$531,000
2021-2025	D-04	Pump Station 33 Upgrade	625	\$360,000	\$61,000	\$421,000
2021-2025	H-12	Pump Station 66 Relocation	222	\$364,000	\$62,000	\$426,000
<b>Phase III (2021 - 2025)</b>						<b>\$2,110,000</b>

Phase IV (2026- 2030)

Year	Project ID	Project Description	Design Flow (gpm)	Construction Cost	Design Cost	Estimated Capital Cost
2026-2030	H-03	Pump Station 160 Gravity Outfall	555 (avg) / 1,368 (peak)	\$952,000	\$162,000	\$1,114,000
2026-2030	H-10	Capital Circle West Force Main - Phase 3 (PS Tatquin2 to Hwy 90)	2,546	\$2,514,000	\$427,000	\$2,941,000
<b>Phase IV (2026 - 2030)</b>						<b>\$4,055,000</b>

Notes:

- 1) Blue text = capacity related improvements.
- 2) Green text = operational strategy related improvements.

Total Estimated Capital Cost (2011 - 2030) \$28,655,000



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## Summary & Recommendations

- The City of Tallahassee's *InfoSWMM* sanitary sewer trunk system model represents a valid working model of the existing system as of August 2008. All model entities are matched one-to-one with the City's GIS.
- A detailed analysis of nine (9) unsewered target areas was performed to determine the present day cost required to provide central sewer to these areas.
- Population projections for the existing USA were established via TAZ data provided by the Tallahassee -- Leon County Planning Department (September 2008).
- The 2030 Trunk System Model was established to provide sewer service to the entire existing USA, and the Woodville Rural Community.
- Capacity analysis of the gravity system showed minor manhole surcharging in 16 areas of the system during wet-weather. All of the observed gravity system surcharging is of little concern, due to minimal surcharging of manholes and significant system storage capacity prior to surface discharge (manhole "over-topping"). Minor surcharging of the system and manholes without detriment to connected customers or risk of overflow is acceptable, practical and economical. These reaches should be reviewed for rehabilitation, repair or replacement in order to reduce I/I entering the system upstream of the applicable area.
- Topographic information for all areas of manhole surcharging observed in the model were confirmed by field survey.
- Additional infiltration/inflow study may be warranted in four basins where wet-weather sources of inflow appear to contribute greatly to the basins' flows (Basins B, H, I, and M).
- All pump stations were individually analyzed for both dry- and wet-weather operation, and revealed some inefficiencies in pump cycle times, many of which may be rectified by adjusting pump operating levels. Several pump stations run minimally throughout the day and have significant capacity available for future flows.
- The wet-weather force main capacity analysis revealed several instances where force mains are either nearing or are exceeding capacity, based on a limiting condition of 6 fps. However none exceeds 10 feet per second for an appreciable time period.
- A phased Capital Improvements Program was created through the year 2030.

The following recommendations are offered to the City as a result of this project:

- Update the model's physical data, calibration (via flow monitoring), and operating scenario(s) to reflect evolving system conditions, operating protocol(s), and bypassing capabilities.
- Consider adjustments to several pump station operating levels, to better equalize the stations' performance.
- Consider modifications to several pump impellers and/or motors, to better equalize the stations' performance, enabling pumps to operate more efficiently.
- The infiltration/inflow into Pump Station 36 should be studied and evaluated in detail and reduced where practicable to reduce flows into and out of this pump station.
- Develop a model maintenance guidelines and specifications protocol, to ensure modifications are uniformly made to the model by all entities whose use of the model is authorized by the City. This protocol should also contain procedures to ensure the model is able to seamlessly update the City's GIS data as applicable, and vice-versa.
- Coordinate development of the Capital Circle West/Southwest Force Main with the proposed widening of Capital Circle.

## 1.0 Introduction

This report presents the City of Tallahassee *Sanitary Sewer System Master Plan - Phase 2*. The report describes the review and analyses conducted by Hatch Mott MacDonald (HMM), on the City of Tallahassee's trunk sewer system model. This phase of the project expanded the City's *InfoSWMM* model (developed in Phase 1) to include future piping, infrastructure, and projected wastewater flows through the year 2030; provide hydraulic and capacity analysis observations; and recommend improvements for a 20-year Capital Improvements Program.

HMM's scope of work for this project included the following:

- Update the 2005 Trunk System Model (developed in Phase 1) to include improvements made to the system through August 2008, including 1:1 match with the City's GIS.
- Develop population and wastewater flow projections through 2030 for the existing Urban Service Area (USA), using 100 gallons per capita-day (gpcd) flow.
- Evaluate nine (9) Unsewered Study Areas originally identified in a 1988 Master Sewer Plan, including preliminary layout of new infrastructure; incorporate the trunk elements of these areas into the *InfoSWMM* model; project future wastewater flows based on Tallahassee-Leon County TAZ population projections; and prepare detailed project cost opinions for each Study Area.
- Modify other areas of the model based on updated GIS information provided by the City, supplement the existing conditions model with additional geometric information, perform basin boundary adjustments as required, research available codes and standards as they relate to sewer system/service area expansion, define future sewerhed delineations within the existing USA, and extend the model entities to incorporate all of these areas.
- Develop future conditions flow data for both dry-weather and wet-weather flow conditions.
- Using the 2030 trunk system model, assess future conditions collection system operation.
- Prepare a Collection System Capacity Assessment Report for future conditions (included in this Project Report).
- Prepare a 20-year Capital Improvements Program (CIP).
- Prepare this Project Report to present study methodology, results of system analyses, the Collection System Capacity Assessment Report, and the CIP.
- Present and demonstrate the updated model to City staff.
- Conduct other analyses, workshops, and presentations as requested by City staff.

The scope of the master-planned system was for a conventional gravity and force main sewer system, and therefore does not plan for or rely on low-pressure sewer systems to implement solutions.

## Evaluation of Unsewered Target Areas

### 3.0 Evaluation of Unsewered Target Areas

#### 3.1 Identification of Unsewered Target Areas

In 1988, the City of Tallahassee commissioned a Master Sewer Plan which evaluated nine (9) septic tank areas within Leon County, eight (8) of which are located within the existing USA. The nine (9) septic tank areas are listed as follows:

1. Killearn Acres
2. Buck Lake/Lafayette Oaks/Mahan
3. Lake Jackson
4. Huntington Estates
5. Lake Munson/Four Points
6. Woodville Rural Community (currently outside the USA)
7. Bobbin Mill/Bobbin Brook
8. Centerville Trace
9. Rose Hill

In February 2009, HMM completed its analysis of these areas, and submitted a separate report to the City describing the evaluation. The boundary for the proposed “Woodville Rural Community” service area (Area 6) was extrapolated from the Tallahassee-Leon County Planning Department’s “Future Land Use Map” (Rev. August 25, 2008).

Proposed sewer system layouts were overlaid upon the 2-foot contour Tallahassee-Leon County GIS layer, and saved as AutoCAD<sup>®</sup> drawings. Minor adjustments were made to the original unsewered area boundaries as provided by the City, to exclude areas which are presently sewerred, as well as to keep proposed sewer service areas within the existing USA boundary.

#### 3.2 Analysis of Unsewered Target Areas

In order to verify the feasibility of extending sanitary sewer service to each of these unsewered areas, HMM personnel studied each area to verify the general topography, the extent of existing development, and the proximity to existing sanitary sewer system infrastructure, from which new infrastructure would be extended to serve each respective area.

## Evaluation of Unsewered Target Areas

Wastewater flows from each unsewered area were estimated using TAZ population data and 100 gpcd, as described above. See **Table 3-1** for a summary of the population and flow projections for each area through 2030.

HMM then completed opinions of probable project cost for infrastructure construction in each area. The unit and lump-sum prices incorporated into these construction cost opinions were taken from recent contractors' bids for similar work items; a 20% construction contingency and estimated engineering cost of 10% were likewise included in each opinion of probable cost. From these values, the total project cost and an average cost per sanitary sewer connection were computed as shown (see **Tables 3-2a & 3-2b**). Detailed cost opinions for each area are shown in Tables 3-1 through 3-9 in HMM's February 2009 report.

In order to establish an accurate count of parcels and dwellings in each study area, the GIS database was used to assess pertinent information, and that information was overlaid on the base maps used to develop the Master Sewer System in each of the nine (9) study areas. These maps were individually reviewed and the features hand-counted. Based on that review, a count was developed of individual parcels (occupied and vacant), single-family homes, and multi-family dwellings (e.g., duplex homes and mobile home parks). In addition, an assessment was made of businesses in each study area that would likely be connected to available sewage collection lines. Based on this assessment, an estimate was made of any additional business connections that could be expected upon completion of the Master Sewer System in each of the nine (9) study areas. Finally, any large undeveloped areas that were not included in these counts were evaluated on a preliminary basis as to the likelihood of future development, considering the presence of significant wetland areas or other physical barriers to development. If the areas were judged to be developable, two (2) sanitary sewer connections per acre were included in the overall cost projection. The total number of connections represents the maximum estimated number of expected sanitary sewer connections for each study area. This number was used to determine the average cost per connection in each study area.

### **3.3 Factors Impacting Feasibility of Sewering Unsewered Target Areas**

As part of the analysis, HMM identified factors that could impact the feasibility of constructing sanitary sewer systems in each study area, such as maintenance of traffic, right-of-way restoration, wetland impacts, etc. As a general statement for all areas, it should be noted that a significant amount of construction will occur in existing streets and roadways. As directed by City staff, the opinions of probable project cost include the cost of roadway replacement and right-of-way restoration where needed. The cost of pavement and right-of-way restoration

## Evaluation of Unsewered Target Areas

averages just over 24% of the total estimated construction cost for each respective study area (ranging from 20% to 29%). Feasibility factors for each area are outlined in HMM's February 2009 report.

As shown in **Table 3-2b**, the three most cost-effective areas to which to provide sanitary sewer service are Areas 5 (Lake Munson), 8 (Centerville Trace), and 6 (Woodville). All of the Unsewered Target Areas have been incorporated into the 2030 Trunk System Model. Two of the three areas noted above (i.e., Woodville Rural Community and Centerville Trace Subdivision) are mentioned specifically as Target Water and Sewer Service Areas in Section 3 of the May 2005 City/County "Water and Sewer Agreement." The "Water and Sewer Agreement" lists a third target area (i.e., Harbinwood Subdivision), which currently lies within a Talquin Electric Cooperative franchise area.

**Figure 3** illustrates the boundaries of these Unsewered Target Areas, and summarizes the cost, population and flow statistics associated with each. A copy of HMM's report for the Unsewered Target Areas is included in **Appendix A**.



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**TABLE 3-1: UNSEWERED AREAS POPULATION & FLOW PROJECTIONS**

YEAR	UNSEWERED AREA POPULATION									UNSEWERED AREA TOTAL POPULATION	TOTAL EST. FLOWS (gpd) *	INCREMENTAL FLOW INCREASE (gpd) *
	Killearn Acres (Area 1)	Buck Lake/ Lafayette Oaks/ Mahan (Area 2)	Lake Jackson (Area 3)	Huntington Estates (Area 4)	Lake Munson/ Four Points (Area 5)	Woodville (Area 6) †	Bobbin Mill/ Brooke (Area 7)	Centerville Trace (Area 8)	Rose Hill (Area 9)			
2008	5,066	5,094	4,205	2,833	6,417	2,884	2,337	1,230	301	30,367	3,036,747	-
2010	5,082	5,211	4,275	3,118	6,683	2,938	2,375	1,271	309	31,263	3,126,259	89,511
2015	5,119	5,503	4,448	3,831	7,348	3,075	2,470	1,375	331	33,500	3,350,036	223,778
2020	5,171	5,700	4,578	4,195	7,692	3,156	2,607	1,528	361	34,989	3,498,920	148,884
2025	5,223	5,897	4,708	4,560	8,035	3,238	2,745	1,681	391	36,478	3,647,804	148,884
2030	5,274	6,094	4,838	4,924	8,379	3,320	2,882	1,835	421	37,967	3,796,687	148,884

20-Year Population Growth (2010 to 2030): 21.4%

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 3-2a: UNSEWERED AREAS SEWER CONNECTION STATISTICS**

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
1. Killlearn Acres	\$20,354,370	1,602	\$12,710	508,159
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
7. Bobbin Mill/Brooke	\$13,072,610	837	\$15,620	237,525
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 3-2b: UNSEWERED AREAS SEWER CONNECTION STATISTICS**  
 (sorted in ascending order by "Average Cost per Connection")

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
1. Killearn Acres	\$20,354,370	1,602	\$12,710	508,159
7. Bobbin Mill/Brooke	\$13,072,610	837	\$15,620	237,525
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



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AAC000035 EB0000155 LB00006783 LC26000216

February 11, 2009

Tom Printy, PE  
City of Tallahassee Underground Utilities  
300 S. Adams Street, B-26  
Tallahassee, Florida 32301

**RE: COT Master Sewer Plan Phase 2  
Task 6-1: Evaluation of Unsewered Areas  
HMM Project No. 246292**

Dear Tom:

Hatch Mott MacDonald (HMM) has completed its evaluation of the unsewered areas outlined in our Scope of Work for the above-referenced project. The following is our letter report detailing our work effort.

## Background

HMM staff prepared preliminary sewer system maps of the nine (9) unsewered areas:

- Killearn Acres
- Buck Lake/Lafayette Oaks/Mahan
- Lake Jackson
- Huntington Estates
- Lake Munson/Four Points
- Woodville
- Bobbin Mill/Bobbin Brook
- Centerville Trace
- Rose Hill

Proposed sewer system layouts were overlaid upon the 2-foot contour Tallahassee/Leon County GIS layer, and saved as AutoCAD drawings. Minor adjustments were made to the original unsewered area boundaries as provided by the City, to exclude areas which are presently sewered, as well as to keep proposed sewer service areas within the existing Urban Services Area (USA) boundary. The boundary for the proposed "Woodville Rural



Community" service area (Area 6) was extrapolated from the Tallahassee/Leon County Planning Department's "Future Land Use Map" (Rev. August 25, 2008).

## Analysis

In order to verify the feasibility of extending sanitary sewer service to each of these unsewered areas, HMM personnel studied each area to verify the general topography, the extent of existing development, and the proximity to existing sanitary sewer system infrastructure, from which new infrastructure would be extended to serve each respective area.

Wastewater flows from each unsewered area were estimated using Tallahassee/Leon County TAZ population data, and by multiplying the projected population by 100 gallons per capita-day (gpcd; average daily flow) as per HMM's scope of work for this project. See **Table 1** for a summary of the population and flow projections for each area through 2030.

HMM then completed opinions of probable construction cost for infrastructure construction in each area. The unit and lump-sum prices incorporated into these construction cost opinions were taken from recent contractors' bids for similar work items. From these values, the total project cost and an average cost per sanitary sewer connection was computed as shown (see **Tables 2a & 2b**). Detailed cost opinions for each area are shown in **Tables 3-1** through **3-9**.

In order to get an accurate count of parcels and dwellings in each study area, the GIS database was used to assess pertinent information and overlay that information on the base maps used to develop the Master Sewer System in each of the nine (9) study areas. These maps were individually reviewed and the features hand-counted. Based on that review, a count was developed of individual parcels (occupied and vacant), single-family homes, and multi-family dwellings (e.g., duplex homes and mobile home parks). In addition, an assessment was made of businesses in each study area that would likely be connected to available sewage collection lines. Based on this assessment, an estimate was made of any additional business connections that could be expected upon completion of the Master Sewer System in each of the nine (9) study areas. Finally, any large undeveloped areas that were not included in these counts were evaluated on a preliminary basis as to the likelihood



of future development, considering the presence of significant wetland areas or other physical barriers to development. If the areas were judged to be developable, two (2) sanitary sewer connections per acre were included in the overall cost projection. The total number of connections represents the maximum estimated number of expected sanitary sewer connections for each study area. This number was used to determine the average cost per connection in each study area.

## Factors Impacting Feasibility

As part of the analysis, HMM identified factors that could impact the feasibility of constructing sanitary sewer systems in each study area. As a general statement for all areas, it should be noted that a significant amount of construction will occur in existing streets and roadways. As directed by City staff, the opinion of probable costs includes the cost of roadway replacement and right-of-way restoration where needed. The cost of pavement and right-of-way restoration averages just over 24% of the total estimated construction cost for each respective study area (ranging from 20% to 29%).

The following is a summary of potential issues that could affect the feasibility of constructing sanitary sewers in each study area:

### Area 1: Killearn Acres

- This is a densely populated area with few vacant lots. Construction will cause traffic flow and routing issues, resulting in lane closures, detours, citizen complaints, etc.
- Environmental issues (e.g., wetlands, water bodies, flood zones) should not be significant, although proper stormwater runoff controls will be required to protect Gilbert Pond, Lake Killikee and other water bodies in the area.

### Area 2: Buck Lake/Lafayette Oaks/Mahan

- Some construction activities will occur along major roadways (e.g., Buck Lake Road, Miccosukee Road, and Mahan Drive) resulting in traffic control issues.
- There are isolated lowlands and wetland areas to avoid, and stormwater pollution prevention will be required where appropriate. Runoff prevention/

Tom Printy, PE Page 3 February 11, 2009



Hatch Mott  
MacDonald

sedimentation control is essential to protect Buck Lake as well as tributaries to the Alford Arm of Lake Lafayette.

- There are portions of the sewer system that are projected to be completed by others (e.g., Florida Department of Transportation and local developers) and are depicted as such on the maps for this study area. While the cost of these portions of the overall system are not included in the cost projections for the City, their completion is a vital part of the functional integrity of the overall sewer plan.

Area 3: Lake Jackson

- Construction along Lake Shore Drive will present challenges in relation to traffic control and roadway/right-of way restoration due to the rolling nature of the roadway, stormwater swales and numerous roadway curves. There are relatively few vacant lots in this portion of the study area.
- Due to the proximity to Lake Jackson (Ford's Arm and Meginnis Arm), stormwater pollution prevention and sedimentation control will be a major concern.

Area 4: Huntington Estates

- There are isolated lowlands and wetland areas to avoid, and stormwater pollution prevention will be required where appropriate.
- Traffic control in the densely developed areas will be a requirement.

Area 5: Lake Munson/Four Points

- While much of the construction will be on side streets, there is a significant amount of anticipated construction activity along Crawfordville Highway, Woodville Highway and Capital Circle SW, all of which are main thoroughfares. Traffic control will be a significant concern.
- Isolated lowlands/wetland areas will require filtration/sedimentation control.



- Significant effort has been expended to restore and maintain Munson Slough and Lake Munson. Construction-related activities will need to be monitored carefully to ensure they do not cause undue harm to these water bodies.

#### Area 6: Woodville

- There are lowland/wetland areas in the northern portion of the Woodville Highway area that must be avoided during construction.
- Woodville Highway is a major thoroughfare and traffic-control will be a major component of construction in this area.
- A significant cost is the length of force main (approximately 18,000 linear feet) necessary to connect this study area to the larger force main at Capital Circle.

#### Area 7: Bobbin Mill

- Due to their proximity to Lake Jackson, some areas will require more careful observation to ensure compliance with any stormwater pollution prevention plan.
- Isolated lowland/wetlands will need to be avoided during construction.

#### Area 8: Centerville Trace

- Few construction-related issues are anticipated for this study area.

#### Area 9: Rose Hill

- Portions of the gravity sewer system are proposed to run along the boundary of Lake Elizabeth. Construction in this area could prompt complaints from residents if stormwater pollution prevention measures are not properly installed and vigilantly maintained throughout construction.
- Since this is the least densely-populated study area, the cost per sanitary sewer connection is significantly higher than for any of the other areas.

As shown in **Table 2b**, the three most cost-effective areas to which to provide sanitary sewer service are Areas 5 (Lake Munson), 8 (Centerville Trace), and 6 (Woodville). All of the areas shown in the accompanying Tables have been incorporated into the 2030 Trunk

Tom Printy, PE Page 5 February 11, 2009



System Model. Two of the three areas noted above (i.e., Woodville Community and Centerville Trace Subdivision) are mentioned specifically as Target Water and Sewer Service Areas in Section 3 of the May 2005 City/County "Water and Sewer Agreement."

Once you have had a chance to review the attached documents in detail, we would welcome the opportunity to discuss them with you and your staff. In the interim, should you have any questions or need additional information regarding any aspect of this report please contact our office.

Very truly yours,

Hatch Mott MacDonald

A handwritten signature in black ink that reads "Michael P. Murphy".

Michael P. Murphy, P.E.  
Vice President  
T 850.222.0334 F 850.561.0205  
mike.murphy@hatchmott.com

MPM: mpk  
encl.

cc: John Buss (City of Tallahassee)  
Blas Gomez, PE (City of Tallahassee)  
M. Broussard, PE (HMM)  
A. Bishop, PE (HMM)  
M. Kane, PE (HMM)  
J. Hosey, EI (HMM)



**TABLE 1: UNSEWERED AREAS POPULATION & FLOW PROJECTIONS**

YEAR	UNSEWERED AREA POPULATION									UNSEWERED AREA TOTAL POPULATION	TOTAL EST. FLOWS (gpd) *	INCREMENTAL FLOW INCREASE (gpd) *
	Killearn Acres (Area 1)	Buck Lake/ Lafayette Oaks/ Mahan (Area 2)	Lake Jackson (Area 3)	Huntington Estates (Area 4)	Lake Munson/ Four Points (Area 5)	Woodville (Area 6) †	Bobbin Mill/ Bobbin Brooke (Area 7)	Certerville Trace (Area 8)	Rose Hill (Area 9)			
2008	5,066	5,094	4,205	2,833	6,417	2,884	2,337	1,230	301	30,967	3,036,747	134,267
2010	5,082	5,211	4,275	3,118	6,683	2,938	2,375	1,271	309	31,263	3,126,259	89,511
2015	5,119	5,503	4,448	3,831	7,348	3,075	2,470	1,375	331	33,500	3,350,036	223,778
2020	5,171	5,700	4,578	4,195	7,692	3,156	2,607	1,528	361	34,989	3,498,920	148,884
2025	5,223	5,897	4,708	4,580	8,035	3,238	2,745	1,681	391	36,478	3,647,804	148,884
2030	5,274	6,094	4,838	4,924	8,379	3,320	2,882	1,835	421	37,967	3,796,687	148,884

20-Year Population Growth (2010 to 2030): 21.4%

\* At 100 gallons per capita-day (as per HMM scopes of work)

† Currently outside the USA



**TABLE 2a: UNSEWERED AREAS SEWER CONNECTION STATISTICS**

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
1. Killlearn Acres	\$20,354,370	1,602	\$12,710	508,159
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
7. Bobbin Mill	\$13,072,610	837	\$15,620	237,525
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 2b: UNSEWERED AREAS SEWER CONNECTION STATISTICS**  
 (sorted in ascending order by "Average Cost per Connection")

Unsewered Study Area	Estimated Project Cost (2009 \$)	Max. Estimated Number of Sewer Connections	Average Cost per Connection	2010 Projected Flow (gpd) *
5. Lake Munson	\$30,614,860	3,162	\$9,680	668,332
8. Centerville Trace	\$4,745,080	485	\$9,780	127,116
6. Woodville †	\$24,576,240	2,150	\$11,430	293,840
4. Huntington Estates	\$9,240,490	729	\$12,680	311,803
1. Killearn Acres	\$20,354,370	1,602	\$12,710	508,159
7. Bobbin Mill	\$13,072,610	837	\$15,620	237,525
2. Buck Lake	\$29,734,500	1,901	\$15,640	521,094
3. Lake Jackson	\$24,452,990	1,532	\$15,960	427,459
9. Rose Hill	\$3,587,520	98	\$36,610	30,931

\* At 100 gallons per capita-day (as per HMM scope of work)

† Currently outside the USA



**TABLE 3-1: UNSEWERED AREA No. 1 - KILLEARN ACRES**

City of Tallahassee Master Sewer Plan Phase 2  
 Preliminary Opinion of Probable Construction Cost  
 Hatch Mott MacDonald Florida, LLC

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
 HMM Project No.: 246292

Study Area #1 Killearn Acres

Basis of Estimate: HMM Conceptual Design  
 Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	69034	LF	\$27.00	\$1,863,918.00
2	8" PVC Sanitary Sewer >10' Deep	23224	LF	\$32.00	\$743,168.00
3	12" PVC Sanitary Sewer >10' Deep	2140	LF	\$41.00	\$87,740.00
4	15" PVC Sanitary Sewer<=10' Deep	2966	LF	\$40.00	\$118,640.00
5	15" PVC Sanitary Sewer>10' Deep	1632	LF	\$45.00	\$73,440.00
6	4' - 10' Deep Manhole	336	EA	\$4,000.00	\$1,344,000.00
7	>10' Deep Manhole	158	EA	\$6,000.00	\$948,000.00
8	Pump Station	2	LS	\$300,000.00	\$600,000.00
9	Sand or Clay for Backfill	151464	CY	\$12.00	\$1,817,568.00
10	Sanitary Sewer Service (SF & SFA 1528)	1602	EA	\$1,250.00	\$2,002,500.00
11	PVC Force Main	2382	LF	\$12.00	\$28,584.00
12	Pavement Replacement	206136	SY	\$20.00	\$4,122,720.00
13	Right-of-Way Restoration	371044	SY	\$4.50	\$1,669,698.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$15,419,976.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$3,083,995.20</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$18,503,971.20</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$1,850,397.12</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$20,354,368.32</b>



**TABLE 3-2: UNSEWERED AREA No. 2 - BUCK LAKE/LAFAYETTE OAKS**  
City of Tallahassee Master Sewer Plan Phase 2  
Preliminary Opinion of Probable Construction Cost  
Hatch Mott MacDonald Florida, LLC

Proj.: City of Tallahassee Master Sewer Plan Phase 2      Study Area #2      Buck Lake/Lafayette Oaks  
HMM Project No.: 246292  
Basis of Estimate: HMM Conceptual Design  
Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	169030	LF	\$27.00	\$4,563,810.00
2	8" PVC Sanitary Sewer >10' Deep	20258	LF	\$32.00	\$648,256.00
3	10" PVC Sanitary Sewer <=10' Deep	5530	LF	\$31.00	\$171,430.00
4	10" PVC Sanitary Sewer >10' Deep	694	LF	\$36.00	\$24,984.00
5	12" PVC Sanitary Sewer <=10' Deep	1134	LF	\$34.00	\$38,556.00
6	4' - 10' Deep Manhole	671	EA	\$4,000.00	\$2,684,000.00
7	>10' Deep Manhole	87	EA	\$6,000.00	\$522,000.00
8	Pump Station	1	LS	\$300,000.00	\$300,000.00
9	Sand or Clay for Backfill	300868	CY	\$12.00	\$3,610,416.00
10	Sanitary Sewer Service (SF & SFA 1679)	1901	EA	\$1,250.00	\$2,376,250.00
11	PVC Force Main	3330	LF	\$12.00	\$39,960.00
12	Pavement Replacement	268558	SY	\$20.00	\$5,371,160.00
13	Right-of-Way Restoration	483404	SY	\$4.50	\$2,175,318.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$22,526,140.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$4,505,228.00</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$27,031,368.00</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$2,703,136.80</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$29,734,504.80</b>



**TABLE 3-3: UNSEWERED AREA No. 3 - LAKE JACKSON**  
**City of Tallahassee Master Sewer Plan Phase 2**  
**Preliminary Opinion of Probable Construction Cost**  
**Hatch Mott MacDonald Florida, LLC**

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
HMM Project No.: 246292

Study Area #3 Lake Jackson

Basis of Estimate: HMM Conceptual Design  
Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	110010	LF	\$27.00	\$2,970,270.00
2	8" PVC Sanitary Sewer >10' Deep	27161	LF	\$32.00	\$869,152.00
3	10" PVC Sanitary Sewer <=10' Deep	2645	LF	\$31.00	\$81,995.00
4	10" PVC Sanitary Sewer >10' Deep	147	LF	\$36.00	\$5,292.00
5	12" PVC Sanitary Sewer >10' Deep	1580	LF	\$41.00	\$64,780.00
6	4' - 10' Deep Manhole	458	EA	\$4,000.00	\$1,832,000.00
7	>10' Deep Manhole	129	EA	\$6,000.00	\$774,000.00
8	Pump Station	3	LS	\$300,000.00	\$900,000.00
9	Sand or Clay for Backfill	218091	CY	\$12.00	\$2,617,092.00
10	Sanitary Sewer Service (SF & SFA 1336)	1532	EA	\$1,250.00	\$1,915,000.00
11	PVC Force Main	15372	LF	\$12.00	\$184,464.00
12	Pavement Replacement	224589	SY	\$20.00	\$4,491,780.00
13	Right-of-Way Restoration	404260	SY	\$4.50	\$1,819,170.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$18,524,995.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$3,704,999.00</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$22,229,994.00</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$2,222,999.40</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$24,452,993.40</b>



**TABLE 3-4: UNSEWERED AREA No. 4 - HUNTINGTON ESTATES**

City of Tallahassee Master Sewer Plan Phase 2  
 Preliminary Opinion of Probable Construction Cost  
 Hatch Mott MacDonald Florida, LLC

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
 HMM Project No.: 246292

Study Area #4 Huntington Estates

Basis of Estimate: HMM Conceptual Design  
 Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	36220	LF	\$27.00	\$977,940.00
2	8" PVC Sanitary Sewer >10' Deep	16150	LF	\$32.00	\$516,800.00
3	12" PVC Sanitary Sewer <=10' Deep	6022	LF	\$34.00	\$204,748.00
4	4' - 10' Deep Manhole	155	EA	\$4,000.00	\$620,000.00
5	>10' Deep Manhole	17	EA	\$6,000.00	\$102,000.00
6	Pump Station	2	LS	\$300,000.00	\$600,000.00
7	Sand or Clay for Backfill	80126	CY	\$12.00	\$961,512.00
8	Sanitary Sewer Service (SF & SFA 619)	729	EA	\$1,250.00	\$911,250.00
9	PVC Force Main	5135	LF	\$12.00	\$61,620.00
10	Pavement Replacement	72758	SY	\$20.00	\$1,455,160.00
11	Right-of-Way Restoration	130964	SY	\$4.50	\$589,338.00
12					\$0.00
13					\$0.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$7,000,368.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$1,400,073.60</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$8,400,441.60</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$840,044.16</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$9,240,485.76</b>



**TABLE 3-5: UNSEWERED AREA No. 5 - LAKE MUNSON/FOUR POINTS**  
**City of Tallahassee Master Sewer Plan Phase 2**  
**Preliminary Opinion of Probable Construction Cost**  
**Hatch Mott MacDonald Florida, LLC**

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
HMM Project No.: 246292

Study Area #5 Lake Munson/Four Points

Basis of Estimate: HMM Conceptual Design  
Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	159770	LF	\$27.00	\$4,313,790.00
2	8" PVC Sanitary Sewer >10' Deep	1450	LF	\$32.00	\$46,400.00
3	10" PVC Sanitary Sewer <=10' Deep	6362	LF	\$31.00	\$197,222.00
4	10" PVC Sanitary Sewer >10' Deep	1843	LF	\$36.00	\$66,348.00
5	12" PVC Sanitary Sewer <=10' Deep	4869	LF	\$34.00	\$165,546.00
6	4' - 10' Deep Manhole	627	EA	\$4,000.00	\$2,508,000.00
7	>10' Deep Manhole	14	EA	\$6,000.00	\$84,000.00
8	Pump Station	5	LS	\$250,000.00	\$1,250,000.00
9	Sand or Clay for Backfill	266700	CY	\$12.00	\$3,200,400.00
10	Sanitary Sewer Service (SF & SFA 2279)	3162	EA	\$1,250.00	\$3,952,500.00
11	PVC Force Main	7828	LF	\$12.00	\$93,936.00
12	Pavement Replacement	260318	SY	\$20.00	\$5,206,360.00
13	Right-of-Way Restoration	468572	SY	\$4.50	\$2,108,574.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$23,193,076.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$4,638,615.20</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$27,831,691.20</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$2,783,169.12</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$30,614,860.32</b>



**TABLE 3-6: UNSEWERED AREA No. 6 - WOODVILLE**

City of Tallahassee Master Sewer Plan Phase 2  
 Preliminary Opinion of Probable Construction Cost  
 Hatch Mott MacDonald Florida, LLC

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
 HMM Project No.: 246292

Study Area #6 Woodville

Basis of Estimate: HMM Conceptual Design  
 Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	113533	LF	\$27.00	\$3,065,391.00
2	8" PVC Sanitary Sewer >10' Deep		LF	\$32.00	\$0.00
3	10" PVC Sanitary Sewer <=10' Deep	9308	LF	\$31.00	\$288,548.00
4	12" PVC Sanitary Sewer <=10' Deep	9366	LF	\$34.00	\$318,444.00
5	4' - 10' Deep Manhole	423	EA	\$4,000.00	\$1,692,000.00
6	Pump Station	7	LS	\$250,000.00	\$1,750,000.00
7	Sand or Clay for Backfill	202278	CY	\$12.00	\$2,427,336.00
8	Sanitary Sewer Service (SF & SFA 1369)	2150	EA	\$1,250.00	\$2,687,500.00
9	PVC Force Main	19377	LF	\$12.00	\$232,524.00
10	Pavement Replacement	197958	SY	\$20.00	\$3,959,160.00
11	Right-of-Way Restoration	356324	SY	\$4.50	\$1,603,458.00
12	Force Main to Capital Circle	18000	LF	\$33.00	\$594,000.00
13					\$0.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$18,618,361.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$3,723,672.20</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$22,342,033.20</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$2,234,203.32</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$24,576,236.52</b>



**TABLE 3-7: UNSEWERED AREA No. 7 - BOBBIN MILL**

City of Tallahassee Master Sewer Plan Phase 2  
Preliminary Opinion of Probable Construction Cost  
Hatch Mott MacDonald Florida, LLC

Proj City of Tallahassee Master Sewer Plan Phase 2  
HMM Project No.: 246292

Study Area # 7 Bobbin Mill

Basis of Estimate: HMM Conceptual Design  
Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	64197	LF	\$27.00	\$1,733,319.00
2	8" PVC Sanitary Sewer >10' Deep	14775	LF	\$32.00	\$472,800.00
3	10" PVC Sanitary Sewer <=10' Deep	401	LF	\$31.00	\$12,431.00
4	10" PVC Sanitary Sewer >10' Deep	948	LF	\$36.00	\$34,128.00
5	12" PVC Sanitary Sewer <=10' Deep	7103	LF	\$34.00	\$241,502.00
6	12" PVC Sanitary Sewer >10' Deep	2487	LF	\$41.00	\$101,967.00
7	4' - 10' Deep Manhole	267	EA	\$4,000.00	\$1,068,000.00
8	>10' Deep Manhole	20	EA	\$6,000.00	\$120,000.00
9	Pump Station	2	LS	\$350,000.00	\$700,000.00
10	Sand or Clay for Backfill	137981	CY	\$12.00	\$1,655,772.00
11	Sanitary Sewer Service (SF & SFA 666)	837	EA	\$1,250.00	\$1,046,250.00
12	PVC Force Main	4428	LF	\$12.00	\$53,136.00
13	Pavement Replacement	94811	SY	\$20.00	\$1,896,220.00
14	Right-of-Way Restoration	170660	SY	\$4.50	\$767,970.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$9,903,495.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$1,980,699.00</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$11,884,194.00</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$1,188,419.40</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$13,072,613.40</b>



**TABLE 3-8: UNSEWERED AREA No. 8 - CENTERVILLE TRACE**

City of Tallahassee Master Sewer Plan Phase 2  
 Preliminary Opinion of Probable Construction Cost  
 Hatch Mott MacDonald Florida, LLC

Proj City of Tallahassee Master Sewer Plan Phase 2  
 HMM Project No.: 246292

Study Area #8 Centerville Trace

Basis of Estimate: HMM Conceptual Design  
 Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	15760	LF	\$27.00	\$425,520.00
2	8" PVC Sanitary Sewer >10' Deep	13181	LF	\$32.00	\$421,792.00
3	4' - 10' Deep Manhole	63	EA	\$4,000.00	\$252,000.00
4	>10' Deep Manhole	66	EA	\$6,000.00	\$396,000.00
5	Sand or Clay for Backfill	44280	CY	\$12.00	\$531,360.00
6	Sanitary Sewer Service (SF &SFA 398)	483	EA	\$1,250.00	\$603,750.00
7	Pavement Replacement	34318	SY	\$20.00	\$686,360.00
8	Right-of-Way Restoration	61772	SY	\$4.50	\$277,974.00
9					\$0.00
10					\$0.00
11					\$0.00
12					\$0.00
13					\$0.00
14					\$0.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
<b>CONSTRUCTION SUBTOTAL:</b>					<b>\$3,594,756.00</b>
<b>CONST. CONTINGENCY (20%):</b>					<b>\$718,951.20</b>
<b>EST. CONST. TOTAL:</b>					<b>\$4,313,707.20</b>
<b>ENGINEERING/ADMIN (10%):</b>					<b>\$431,370.72</b>
<b>EST. PROJECT BUDGET:</b>					<b>\$4,745,077.92</b>



**TABLE 3-9: UNSEWERED AREA No. 9 - ROSE HILL**  
**City of Tallahassee Master Sewer Plan Phase 2**  
**Preliminary Opinion of Probable Construction Cost**  
**Hatch Mott MacDonald Florida, LLC**

Proj.: City of Tallahassee Master Sewer Plan Phase 2  
HMM Project No.: 246292

Study Area #9 Rose Hill

Basis of Estimate: HMM Conceptual Design  
Estimator: M. Murphy, A. Bishop

Item	Description	Quantity	Unit	Unit Price	Amount
1	8" PVC Sanitary Sewer <=10' Deep	16987	LF	\$27.00	\$458,649.00
2	8" PVC Sanitary Sewer >10' Deep	4486	LF	\$32.00	\$143,552.00
3	4' - 10' Deep Manhole	65	EA	\$4,000.00	\$260,000.00
4	>10' Deep Manhole	20	EA	\$6,000.00	\$120,000.00
5	Pump Station	1	LS	\$300,000.00	\$300,000.00
6	Sand or Clay for Backfill	32854	CY	\$12.00	\$394,248.00
7	Sanitary Sewer Service (SF & SFA 80)	98	EA	\$1,250.00	\$122,500.00
8	PVC Force Main	2620	LF	\$12.00	\$31,440.00
9	Pavement Replacement	31587	SY	\$20.00	\$631,740.00
10	Right-of-Way Restoration	56820	SY	\$4.50	\$255,690.00
15					\$0.00
16					\$0.00
17					\$0.00
18					\$0.00
19					\$0.00
20					\$0.00
21					\$0.00
22					\$0.00
23					\$0.00
24					\$0.00
				<b>CONSTRUCTION SUBTOTAL:</b>	<b>\$2,717,819.00</b>
				<b>CONST. CONTINGENCY (20%):</b>	<b>\$543,563.80</b>
				<b>EST. CONST. TOTAL:</b>	<b>\$3,261,382.80</b>
				<b>ENGINEERING/ADMIN (10%):</b>	<b>\$326,138.28</b>
				<b>EST. PROJECT BUDGET:</b>	<b>\$3,587,521.08</b>

# UNSEWERED AREAS MAP

**STUDY AREA 8: BOSHILL**  
 Estimated Project Cost: \$3,587,130  
 Max Est Sanitary Sewer Connections: 88  
 Cost Per Connection: \$40,763  
 Study Area Population (2010): 309  
 Study Area Population (2035): 421  
 Population Increase: 35,25%

**STUDY AREA 1: KILLBUCKLE**  
 Estimated Project Cost: \$20,354,370  
 Max Est Sanitary Sewer Connections: 1,002  
 Cost Per Connection: \$20,219  
 Study Area Population (2010): 5,883  
 Study Area Population (2035): 5,274  
 Population Increase: 3,75%

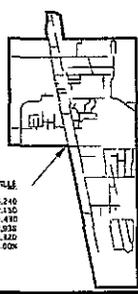
**STUDY AREA 3: LAKE JACKSON**  
 Estimated Project Cost: \$24,412,960  
 Max Est Sanitary Sewer Connections: 1,537  
 Cost Per Connection: \$15,950  
 Study Area Population (2010): 4,271  
 Study Area Population (2035): 4,818  
 Population Increase: 13,15%

**STUDY AREA 6: HUNTINGTON SQUARE**  
 Estimated Project Cost: \$8,240,450  
 Max Est Sanitary Sewer Connections: 729  
 Cost Per Connection: \$11,310  
 Study Area Population (2010): 2,118  
 Study Area Population (2035): 4,974  
 Population Increase: 17,92%

**STUDY AREA 2: BUCKLASE**  
 Estimated Project Cost: \$19,734,500  
 Max Est Sanitary Sewer Connections: 1,100  
 Cost Per Connection: \$17,940  
 Study Area Population (2010): 2,211  
 Study Area Population (2035): 4,094  
 Population Increase: 18,95%

**STUDY AREA 5: LAKE MANSION**  
 Estimated Project Cost: \$30,614,260  
 Max Est Sanitary Sewer Connections: 3,160  
 Cost Per Connection: \$9,688  
 Study Area Population (2010): 8,883  
 Study Area Population (2035): 12,379  
 Population Increase: 23,30%

**STUDY AREA 4: WOODVILLE**  
 Estimated Project Cost: \$2,457,240  
 Max Est Sanitary Sewer Connections: 2,130  
 Cost Per Connection: \$1,154  
 Study Area Population (2010): 2,032  
 Study Area Population (2035): 3,822  
 Population Increase: 13,60%



- ITEMS INCLUDED IN PROJECT COSTS**
- Sanitary Sewer
  - Manholes
  - Rainy Season
  - Force Mains
  - Street Cuts
  - Sanitary Sewer Service Lines
  - Force Mains Right-of-Way (R/W) of R/W
  - Right-of-Way Sanitary Sewer Right-of-Way

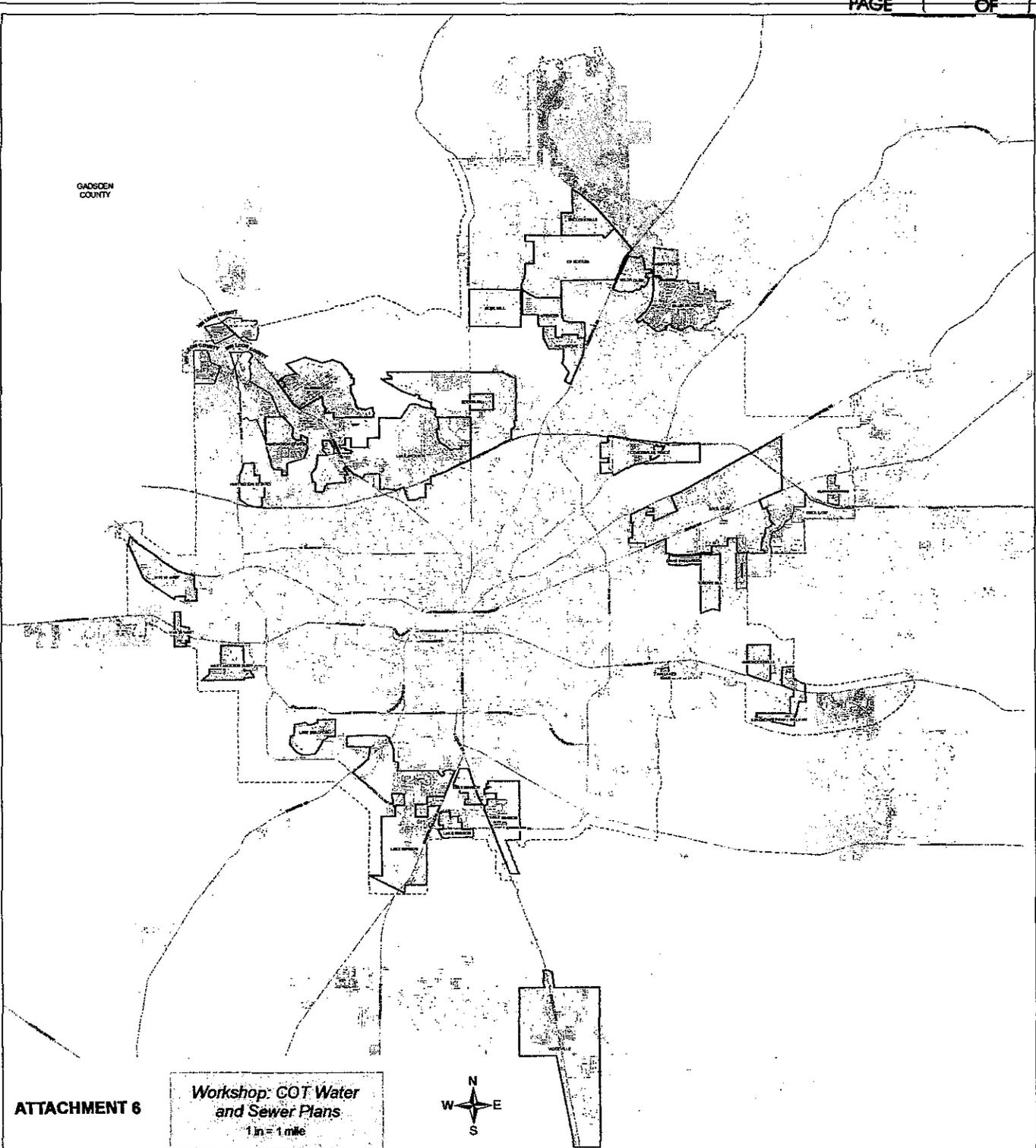
- LEGEND**
- EXISTING QUALITY SEWER
  - PROPOSED QUALITY SEWER
  - UNSEWERED AREA BOUNDARY
  - PROJECT
  - STUDY AREA 1
  - STUDY AREA 2
  - STUDY AREA 3
  - STUDY AREA 4
  - STUDY AREA 5
  - STUDY AREA 6
  - STUDY AREA 8
  - STUDY AREA 9

CITY OF TALLAHASSEE  
MASTER SEWER PLAN - PHASE 2



P:\246275101\_TLH Sewer Master Plan Phase 2\Drawings\Area Studies\UNSEWERED AREAS MAP.dwg, 2/1/2018, 10:11:11 AM, 10/25/18, 10/25/18

GADSDEN COUNTY



ATTACHMENT 6

*Workshop: COT Water and Sewer Plans*  
 1 in = 1 mile



- |                               |                                      |
|-------------------------------|--------------------------------------|
| ▲ Septic Tanks                | Major Roads                          |
| ⊕ Study Areas                 | Talquin Water and Sewer Service Area |
| ⊕ County Identified Areas     | Talquin Water Service Areas          |
| ⊕ Urban Service Area Boundary | City Limit                           |
| ⋯ Sewer Lines                 | County Boundary                      |



**DISCLAIMER**  
 NOTE: This publication represents the best information available from the Gadsden County, the City of Tallahassee, and the Leon County Planning Department Offices. However, the reader is advised that this information is not intended to be used as a substitute for professional engineering or architectural services. Any reliance on the information contained in this publication is at the user's sole risk. The Gadsden County, the City of Tallahassee, and the Leon County Planning Department Offices are not responsible for any use of the information contained herein for any purpose other than that for which it was prepared.

Map created on December 1, 2010  
 by Tracy MacCannan  
 Tallahassee Leon County GIS  
 Telephone: (904) 636-1523  
 Web: <http://www.tdigh.org>



## Executive Summary

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The City of Tallahassee selected the team of Malcolm Pirnie, SE Consulting (MBE), and Diversified Drafting and Design (3DS - MBE) to update the City's Water Master Plan. The purpose of the Water Master Plan Update was to identify water supply and system improvements necessary to meet projected water demands through the year 2030.

The majority of the improvements identified in this Water Master Plan Update are driven by water quality, water demand, fire flow, renewal and replacement of infrastructure and future growth, and as such the timing of those improvements is ultimately driven by when that growth occurs. The capital improvements plan (CIP) presented is intended to serve as a budgeting tool. The City will need to monitor growth and may need to adjust the CIP schedule and timing of certain projects as growth occurs. For example, growth in one development may occur more quickly than projected, and as such, certain improvements may need to happen sooner than indicated. On the other hand, growth may not return as quickly as projected, meaning certain projects can be delayed.

### Population Projections

Three different population projection methodologies were evaluated: Traffic Analysis Zones (TAZ), University of Florida Bureau of Economic and Business Research (BEBR), and U.S. Census data. The Tallahassee-Leon County Planning Department utilizes TAZ projections for concurrency planning and development of the Comprehensive Plan. The City also recently utilized TAZ projections for development of the 2009 Master Sewer Plan. Thus, for consistency with other planning efforts and because TAZ projections have historically been the most representative growth in the Tallahassee area, the population and water demand estimates in this Water Master Plan Update are based upon TAZ projections.

The urban service area (USA) is intended to provide for growth and development within the planning horizon of the Comprehensive Plan (20 years). Development within the USA is characterized by an urban level of government services such as roads, mass transit, stormwater, water, sewer, solid waste and parks. There are 692 TAZs in the urban service area (USA). A summary of the TAZ-based population projections for growth inside the USA is provided in Table ES-1.

**Table ES-1:  
 Summary of TAZ-Based Population Projections**

Year	Estimated USA Population
2003	225,960
2005	233,430
2008	244,634
2010	252,103
2015	270,177
2020	285,548
2025	300,320
2030	315,092

Source: City of Tallahassee, Master Sewer Plan Phase 2 Population and Wastewater Flow Projection, Hatch Mott MacDonald (2009).

### Future Water Demand

The Tallahassee-Leon County Planning Department estimates an additional 22,637 habitable units (single-family, multi-family, and other residential units) in known developments in the USA by the year 2030. The department utilizes a factor of 2.51 persons per unit for planning purposes. Therefore, an estimate of the persons associated with the 22,637 habitable units can be calculated by multiplying the number of units by 2.51 persons per unit for a total of 56,819 persons. Subtracting these persons from the total TAZ projected population growth of approximately 62,989 people results in approximately 6,170 additional people located in the USA, but not within one of the planned developments.

Future water demand was projected based on the following:

1. Average day demand of 100 gallons per capita per day (gpcd) to determine future annual average day demands and 160 gpcd to determine future maximum day demands within planned development in the Tallahassee-Leon County planning area (56,819 persons). This will be added to the existing demands so as not to diminish current non-residential demands. This assumes the majority of future growth in these areas is residential in nature.
2. Future maximum day demand outside known future development (6,170 persons), but within the USA, will be based on 150 gpcd due to the location of the demand.

Executive Summary

A summary of future demands for the period of 2010-2030 is provided in Table ES-2.

**Table ES-2:  
 Projected Future Water Demands (2010-2030)**

YEAR	Increase in Population per TAZ (inside the USA) <sup>1</sup>	DEMAND (MGD)			
		Actual AAD	TAZ AAD	Adjusted AAD	Adjusted MDD <sup>2</sup>
2010	0	26.63	39.58	33.10	49.65
2015	18,674	28.50	41.54	34.97	52.46
2020	14,771	29.98	43.09	36.46	54.68
2025	14,772	31.46	44.64	37.94	56.90
2030	14,772	32.90	46.19	39.37	59.06
TOTAL	62,989				

1. The 2010 Actual projection is based on the 2008 consumption data. The 2010 TAZ projection is based on the TAZ population projection times 157 gpcd. The 2010 Adjusted projection is based on the 10 year maximum consumption.
2. The Adjusted max day demand is calculated by multiplying the Adjusted AAD by a factor of 1.5

The City's existing consumptive use permit (CUP) establishes the following permitted capacities:

1. Combined average annual withdrawal of 33,700,000 gallons per day.
2. Maximum combined withdrawal of 59,310,000 gallons during a single day.
3. Combined monthly withdrawal of 1,415,400,000 gallons.

The use of TAZ-based demand projections as a basis for future CUP projections results in AAD and maximum day demand projections that are unrealistically high due to the inclusion of Talquin customers and currently unserved areas. Conversely, the use of the 2008 actual AAD as a basis for future CUP projections, likely results in projections that are unrealistically low. Therefore an adjusted AAD needs to be selected so that it is more in line with the observed historic values. The "Adjusted AAD" is then used as the base demand and then increases demand incrementally in proportion to the TAZ projections. The base adjusted demand (33.1 MGD) is slightly less than the current permitted average annual daily withdrawal. Based on the projections in Table ES-2, the projected 2015 AAD of 34.97 is larger than the permitted annual average withdrawal. However, the projected 2015 maximum day demand of 52.46 MGD, the AAD multiplied by a factor of 1.5, is less than the permitted maximum day withdrawal. The adjusted AAD projections can be used by the city as the basis for the CUP renewal. At a minimum, it likely will be necessary to modify the CUP annual average day capacities in the near future.

## Distribution Hydraulic Modeling

For the purposes of developing the Water Master Plan Update, a hydraulic model was created in InfoWater, version 7.0 as requested by city staff. The City's geographic information system (GIS), including improvements completed as a part of this project, was used as the basis for the model development.

There are no strict guidelines for performance of calibration in terms of goodness-of-fit between modeled and measured data. The level of calibration required generally depends on the specific system being modeled and the intended use of the model. The calibration results for the Tallahassee model fall within the suggested goodness-of-fit ranges. The results at each of the storage tanks were very good, with predicted tank levels falling within the standard of  $\pm 6$  feet. The majority of final modeled flows were within 2% of the measured values.

The calibration process provided many insights into the operation of the Tallahassee distribution system. Overall, the calibration resulted in a model that will effectively serve to address the goals of the Water Master Plan, and enable the City to effectively evaluate distribution system operation and improvements in the future.

## Future Water Supply Alternatives

Projected future water demand will result in the need for improvements to the water system. Specifically, an additional groundwater well will be required in the northeast quadrant of the system in the vicinity of existing Tank 7, and a new or larger tank with either significant changes to the well operational strategies for Wells 23 and 26, an additional groundwater well or upgraded piping will be required in the northwest quadrant in the vicinity of Tank 5. More detail about well operations is provided in Section 2.

Though productivity will vary locally depending on the site-specific geology encountered, a new well in the southeast quadrant is expected to have more than adequate capacity and favorable water quality similar to other existing wells in the area. Land for a new well site can be reserved prior to construction of the development.

The northwest quadrant is located at the western edge of the region of high groundwater availability. Although existing well capacities in the area are sufficient, the City has observed poor water quality in this area, particularly with respect to hydrogen sulfide, iron, and manganese. These observations are consistent with regional studies that indicate a general decline in water quality to the west of the City due to decreased aquifer recharge and permeability. Thus, a new well in this area may require some level of treatment.

Executive Summary

**Distribution Expansion Alternatives**

The City’s existing infrastructure is largely adequate to meet future water supply needs. The City has a highly looped, extensive water supply grid, and as a result there are very few identifiable bottlenecks in the system that would prevent the City from meeting future water demands. Based on a detailed review of the system and projected water demands from 2010 to 2030, the following improvements are recommended:

- Installation of a 2,500 gpm water supply well (Well 35) to supply water the Southwood DRI
- Installation of a 2,500 gpm water supply well (Well 32) as a redundant well to Well 25.
- Complete water main replacement project near Interstate 10 and State Highway 319/County Road 148B/Thomasville Road (in construction).
- Prior to 2020, install a new 500,000 gallon or larger elevated storage tank in the northwest quadrant of the system, or replace the existing tank with a 1,000,000 gallon or larger tank.
- Prior to 2020, install a new 1,500 gpm water supply well in the vicinity of the northeastern portion of the City’s service area, i.e. the western portion of the Welaunee development.
- Prior to 2020, modify controls at Well 23 and 26 and/or complete one of the following:
  - Add greensand treatment at Well 23
  - Add a new well that includes greensand treatment in the northwest quadrant.
  - Replace 3.5 miles of existing 6-, 8-, and 10-inch piping running east to west along Mahan and Call, on either side of downtown with 12-inch mains.
- Installation of 500 ft of 6-inch pipe from Pottsdamer Road into Pennell Circle to aid with fire flow pressure.
- Installation of 1.5 miles of 8-inch pipe to loop the Highway 90 West fire flow issue. The loop will go south on Barineau Rd from the existing pipe in Highway 90 and east on Highway 20 to connect to the existing pipe.
- A parallel pipe to the Woodville pipe consisting of approximately 18,000 ft (3.5 miles) of 10 to 12-inch pipe, and would require an additional PRV on the pipe to reduce the pressures to the southern portion of the system.
- A parallel pipe to serve Chason Woods. The pipe would be approximately 29,000 ft (5.5 miles). Due to the uncertainty of the Chason Woods development this project has not been included in the Capital Improvement Plan.

Executive Summary

## Downtown Infrastructure Replacement

Additional investigative work will assist in prioritizing water mains in the downtown area for replacement or rehabilitation, and help to ensure water supply and fire flows to the downtown area. Short of that investigative work, the following are recommended:

- **Gate Valves** - Exercise gate valves to find which gate valves are defective. Remove and replace defective gate valves prior to water main replacement or rehabilitation if the gate valve is required to isolate the water main. Otherwise remove and replace gate valve during water main replacement and rehabilitation activities.
- **6-inch Water Mains** – Remove and replace 6-inch water mains (2 and 4-inch water mains if distribution lines or hydrant lines) with 8-inch diameter pipe.
- **10-inch and 14-inch Water Mains** – Replace 10-inch and 14-inch water mains with 12-inch and 16-inch diameter pipe when these pipes need replacing.
- **Larger Diameter Water Mains** – Investigate the larger diameter water mains for corrosion by testing externally or internally. Establish a capital improvement program to replace or rehabilitate the larger diameter pipelines according to the remaining life expectancy.

It is recommended that the first phases of the project include the replacement of 4-inch (if necessary) and the 6-inch water mains with 8-inch diameter pipelines until completion. Upon completion of this phase, the larger diameter pipelines starting with 8-inch is to be addressed for rehabilitation or replacement.

## Capital Improvements

Table ES-3 provides a summary of the capital improvement recommendations resulting from these master planning efforts. Obviously, these improvements do not include ongoing water main replacement and other City maintenance programs. The information contained in the table includes only those operational and capacity improvements necessary to meet the water supply needs of future customers and other improvements included in this report, such as the cost of the downtown infrastructure improvements.



# 1. Introduction

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## 1.1. Overview

The City of Tallahassee selected the team of Malcolm Pirnie, SE Consulting, and Diversified Drafting and Design (3DS) to update the City's Water Master Plan. The purpose of the Water Master Plan Update was to identify water supply and system improvements necessary to meet projected water demands through the year 2030. The project consisted of the following main tasks:

1. Geographic information system (GIS) gap analysis and improvements to improve GIS and water distribution model connectivity and assure the water model was reflective of the physical distribution system as contained in the GIS.
2. Creation and calibration of an "all-pipes" water distribution system model.
3. Projection of future water demands through the year 2030.
4. Identification of deficiencies in the existing water distribution system and improvements to correct those issues.
5. Identification of distribution system improvements necessary to meet future demands.
6. Evaluation of the adequacy of the existing groundwater supply capacity and recommendations for additional supply capacity to meet future demands.
7. cursory evaluation of the City's reuse and conservation efforts and a discussion of the impacts to water demand.
8. Development of a downtown area infrastructure replacement plan.
9. Prioritization of recommended improvements and preparation of a 20-year capital improvements plan (CIP) to be used by the City as a road map for future improvements.

The majority of the improvements identified in this Water Master Plan Update are driven by future growth, and as such the timing of those improvements is ultimately driven by when that growth occurs. The CIP presented is intended to serve as a budgeting tool. The City will need to monitor growth and may need to adjust the CIP schedule and timing of certain projects as growth occurs. For example, growth in one development

may occur more quickly than projected, and as such, certain improvements may need to happen sooner than indicated. On the other hand, growth may not return as quickly as projected, meaning certain projects can be delayed.

## 1.2. Purpose

The City of Tallahassee has experienced significant and continuous growth over the past 30 or more years. Since 1970, the population has grown from 103,000 to approximately 250,000 at a rate of approximately 45,000 people every 10 years. Being able to meet the demands associated with such growth requires vigilance on behalf of the City. This document identifies necessary improvements and other recommendations for the City's water system to continue successful operation and accommodate future growth.

In the years leading up to this project, Florida and the City of Tallahassee were experiencing record growth. However, the recent downturn in the economy has caused that growth to slow down and, in some cases, come to a complete stop. While this Water Master Plan Update has tried to account for the downturn in growth, the future is still uncertain. As such, this document will function as a guiding document in many ways.

There are a significant number of developments of regional impact (DRIs) and other planned communities in the Tallahassee water service area. This document makes some assumptions regarding the timing of that growth. However, it is likely that some developments may take longer to reach buildout than anticipated, others may develop more quickly, and some may never materialize. What is important is that this document identifies the water supply and distribution system improvements necessary to accommodate that growth. The City will need to monitor actual development and utilize the hydraulic model developed as a part of this project to determine when certain improvements actually need to be made. As such the CIP presented in this document is intended to be used by the Water Utility and the City's planning department for budgeting purposes, but the actual projects scheduled and constructed in a given year are likely to change.

## 1.3. Document Organization

This document includes an Executive Summary, 12 chapters, a number of appendices, and is organized as follows:

**Executive Summary:** Provides a summary of the evaluation and recommendations discussed in this document.

**Chapter 1:** Presents an introduction to the project and purpose of the Water Master Plan Update.

**Chapters 2 – 10:** Provides detailed discussions, evaluations, and recommendations for each of the main scope areas, including GIS, water demand projections, hydraulic model development and calibration, future supply alternatives, water reuse and conservation, and downtown area infrastructure replacement.

**Chapter 11:** Includes a 20-year CIP for the recommended improvements and infrastructure replacement.

**Chapter 12:** Summarizes the analyses and recommendations presented throughout the document.

**Chapter 13:** Provides references.

**Appendices:** Include additional details and other helpful information relative to the discussion, evaluation, and recommendations contained in the master plan.

## 5. Projected Water Demands

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### 5.1. Overview

The purpose of this section is to provide water demand projections developed for the Water Master Plan Update and summarize the data sources utilized developing those projections. The planning horizon for these projections and the Water Master Plan Update is through the year 2030.

Existing City-County planning documents (Comprehensive Plan, EAR, etc.) and population projections for Leon County from a variety of sources including U.S. Census Bureau data, City and County Traffic Analysis Zone (TAZ) data, University of Florida's Bureau of Economic and Business Research (BEBR) and data provided by City-County Planning staff were reviewed as part of these efforts. Based on this data, population and water demand projections have been provided for the years 2008 (baseline or existing demand), 2010, 2015, 2020, 2025, and 2030.

The Tallahassee-Leon County Planning Department (TLCPD) maintains a considerable amount of data related to population projections for greater Leon County. The focus of this section is the population projections for the urban service area (USA). The USA was adopted as part of the Comprehensive Plan in 1990. Leon County consists of approximately 667 square miles, of which approximately 161 square miles are within the USA. Almost all of the City's 104 square miles are located within the USA. The USA is intended to provide for growth and development within the planning horizon of the Comprehensive Plan (20 years). Development within the USA is characterized by an urban level of government services such as roads, mass transit, stormwater, water, sewer, solid waste and parks.

The USA was established for a number of reasons revolving around managed and environmentally acceptable growth. Specifically, the reasons include:

1. Control premature development of rural lands;
2. Promote compact development;
3. Encourage multi-modal transportation options;
4. Encourage affordable living; and
5. Promote the economic and efficient provision of urban services.

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Projected Water Demands

Historically, the USA has remained virtually unchanged. The 2007 Evaluation and Appraisal Report (EAR) reflected this and confirmed that the USA contains sufficient developable land to accommodate approximately 90 percent of the development that has occurred since the Comprehensive Plan's adoption.

City-County Planning staff does not anticipate any substantial expansion of the existing USA limits through the year 2020.

Beyond 2020 staff anticipates additional population growth within the USA and in limited areas in which the USA would be expanded. The urban fringe land use category and location of planned development provide direction as to areas in which these long term population and water demand increases will occur.

**5.2. Population Projection Data**

**5.2.1. Transportation Analysis Zone (TAZ) Data**

In 2004, a database was developed by the Tallahassee-Leon County Planning Department based upon transportation analysis zones. These zones vary in size based upon the density or nature of development. In a predominantly urban area, the TAZ may be as small as a city block. In rural areas, a TAZ may be as large as 10 square miles. Typically the zones try to encompass homogeneous urban activities, i.e. residential, commercial, or industrial. Zones are designed to be relatively homogeneous traffic generators and are sized so that only 10-15 percent of the trips are intra-zonal. The TAZ data are developed based on historic development patterns, permitting activity, zoning and future land use categories, and anticipated new development.

Leon County contains 760 TAZs. The total number of TAZs in the USA is 692. The population estimated and projected for each zone formed the basis for the population projections developed by Hatch Mott MacDonald in 2009 as a part of the City of Tallahassee Master Sewer Plan and attached in Appendix A. That report analyzed each zone within the USA in the context of existing and planned development in that zone. A summary of the TAZ-based population projections for growth inside the USA is provided in Table 5-1.



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**Table 5-1:  
 Summary of TAZ-Based Population Projections**

Year	Estimated USA Population
2003	225,960
2005	233,430
2008	244,634
2010	252,103
2015	270,177
2020	285,548
2025	300,320
2030	315,092

Source: City of Tallahassee, Master Sewer Plan Phase 2 Population and Wastewater Flow Projection, Hatch Mott MacDonald (2009).

It should be noted that the basis for TAZ data produced in 2008-2009 is the 2004 BEBR data. The BEBR data were broken down into the TAZ framework and specifically updated as development occurred or was anticipated. The most recent 2009 BEBR data are found in Appendix B. The trends reflected in BEBR data over the past 5 years should be considered.

The TAZ-based population projections are currently being used as the basis for capacity projections in connection with wastewater flow projections by the City of Tallahassee. Similarly, these population projections appear to be the most accurate when compared to the other methods discussed herein.

**5.2.2. Bureau of Economic and Business Research Data**

The University of Florida Bureau of Economic and Business Research provides annual population estimates and projections for the state of Florida and its local jurisdictions. BEBR uses the housing unit method, which encompasses a wide variety of data sources including occupied housing units, number of active electric utility meters, building permits, and the estimated average population per household. Historically, BEBR population estimates have tended to overestimate population growth in a growing housing market. The speculative boom during the 2002-2006 time frame resulted in a 2006 spike in the BEBR population estimates for Tallahassee and Leon County during the applicable planning period. Since 2006, the estimates have dropped significantly. The 2009 BEBR population estimates and 2010-2030 projections are attached in Appendix B. A comparison of the BEBR 2010-2030 projections during years 2004-2008 compiled by Tallahassee-Leon County Planning Department which shows the recent corrections, is provided in Table 5-2.

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**Table 5-2:  
 Comparison of Recent BEBR 2030 Population Projections (2004-2008)**

YEAR	BEBR Population Projection				
	2004	2005	2006	2007	2008
2010	282,300	288,400	296,500	291,700	279,200
2020	316,800	326,100	342,200	331,600	312,400
2030	346,700	359,000	378,100	363,700	340,800

Source: *University of Florida Bureau of Economic and Business Research (2004-2008)*

Note: These projections produced by BEBR are for Leon County, not just the USA. They are informational to show the variation in projections between 2004-2008.

As discussed above, it should be noted that the 2004 BEBR data provided the base line data for the projections contained in the TAZ-based population projections for the USA. These projections were on the front end of the significant increase in population estimates. The 2009 projection for the year 2030 is 327,300 compared with the 2004 projection of 346,700 - a difference of 19,400, which is statistically relevant. In short, the TAZ-based numbers may tend toward the higher side on population projections due to their foundation in 2004 BEBR projections which were prior to the recent corrections.

**5.2.3. Census Tract Data**

A census tract is a geographic region defined for the purpose of taking the census. In most circumstances, these coincide with the boundaries of cities and towns in urban areas. In unincorporated areas, they can be arbitrary except for coinciding with political lines. Census tracts are subdivided into block groups or census blocks. Leon County contains 48 total census tracts. Attached in Appendix C is a map reflecting population growth by census tract between 2000-2008. Table 5-3 summarizes population growth and projections based on census tract data both within and outside the USA.

Tallahassee-Leon County Planning Department staff produced the following excerpted population growth estimates on the following page by census tract and produced the map attached in Appendix C. This effort brought special attention to the fastest growing census tracts between 2000 and 2007. These observations provided in the staff report are summarized below. The observations as to nature and extent of growth provide insight into what can be expected in the areas of the USA during the planning period for this project (2030).

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**Population Growth Estimates by Census Tract 2000 – 2008**

The population of Leon County increased 14.8% between April 1, 2000 and April 1, 2008 according to Bureau of Economic & Business Research estimates, growing from 239,452 to 274,892 (a net increase of 35,440 residents). To estimate the population growth by census tract, the net population increase was distributed across Leon County's 48 census tracts utilizing TLCPD's population estimation methodology described herein.

**Total Growth in Population**

By total growth, it is estimated fourteen census tracts added more than 1,000 net new residents between 2000 and 2008. Combined, these fourteen census tracts accounted for an estimated 65% of the net new residents during the period. The largest estimated numerical increase in net new residents has been in census tract 26.01 (80% of the growth coming from single-family attached and detached units built within Southwood).

**Percentage Growth in Population**

By percentage growth, Census Tract 26.01 doubled in population between 2000 and 2008, fueled by Southwood. Eleven other census tracts grew by more than 20% over the period: census tracts 25.04, 24.07 and 23.04 expanded with a blend of new single-family and multi-family units, census tracts 24.05, 25.05, 25.06 and 18.01 expanded almost exclusively by new single-family units while census tracts 18.02, 16.01, 21.02, and 20.02 all exhibited strong growth due almost entirely to new multi-family units.

Census Tract	Estimated Numerical Population Growth 2000-2008	Census Tract	Estimated Percentage Population Growth 2000-2008
26.01	2,986	26.01	99.6%
25.04	2,524	18.02	36.5%
24.05	2,321	25.04	33.6%
24.07	2,196	23.04	32.1%
21.02	1,928	24.07	30.4%
25.02	1,696	16.01	26.2%
25.06	1,502	21.02	25.5%
20.02	1,307	25.05	23.2%
18.02	1,264	24.05	23.0%
22.03	1,198	25.06	22.5%

**Population Estimation Methodology**

The Tallahassee-Leon County Planning Department's population estimates by census tract are based on factual information available regarding population growth since the decennial Census in April 2000. All certificates of occupancy issued for new units by type (single-family detached, townhouse, multi-family, etc.) and by Census Tract are added to the total unit count in the Census 2000 figures (which were measured in April of 2000) to reach a new total unit count for each Leon County census tract.

The relationship between housing units and population is set by the average persons-per-household for both owner and renter occupied units and the occupancy rate of housing units by housing unit type by census tract from Census 2000. Attempting to estimate changes in these figures in any census tract is at best conjecture. No reliable annual data exists on changes in persons-per household and occupancy rates. It can be safely assumed, and it is in this estimate methodology, that the overall relationship between housing units and population as measured by aggregate persons-per-household and occupancy varies only slightly over time, and should be very close in 2008 to that in April of 2000.

**Sources:**

- \* 2000 U.S. Census Bureau
- \* 2008 University of Florida
- \* 2000-2008 Census Tract Estimates, Planning Department
- \* Tallahassee-Leon County Planning Department

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**Table 5-3:  
 Comparison of Recent Census-Based Population Projections**

YEAR	POPULATION INSIDE USA	PERCENT OF POPULATION INSIDE USA	TOTAL POPULATION
1970 CENSUS	96,861	94.0%	103,047
1980 CENSUS	135,047	90.8%	148,655
1990 CENSUS	170,527	88.6%	192,493
2000 CENSUS	208,432	87.0%	239,452
2015 PROJECTION	252,713	87.9%	287,500
2030 PROJECTION	288,024	88.0%	327,300

*Source: TLCPD, 1970-2000, Tallahassee-Leon County Planning Department estimates based on U.S. Bureau of the Census data; 2003-2030, Capital region Transportation Planning Agency, Long Range Transportation Plan*

Note: This provides a comparison of the trend in census population estimates to BEBR data. The population projections for the years 2015 and 2030 were modified to match the most recent 2009 BEBR population projections i.e. the BEBR total population projections were used for years 2015 and 2030, % of population inside the USA has been determined by TLCPD.

An additional illustrative resource is the map attached in Appendix C depicting the existing distribution system overlaid on the Census Tract map for Leon County.

**5.3. Population Projection Methodology**

The methodology used by the Tallahassee-Leon County Planning Department to formulate long-range population projections is set forth in a 2007 Tallahassee-Leon County Planning Department memorandum. In part, it explains that long range projections involve extrapolations (curve fittings) performed using U.S. Census Bureau population data and fit to linear, geometric, parabolic, modified exponential, Gompertz, and logistic curves. The extrapolation technique is a simplistic model that uses past gross population trends to project future population levels.

The base periods studied by Tallahassee-Leon County Planning Department were 1950-2000 and 1980-2000. Using the six curves and two different base periods, twelve possible models were generated. The fit of the models were evaluated using three quantitative statistical forms of evaluation. The base period 1980-2000 was chosen even though it includes only three points of observed data (census data), due to the fact that the curves resulted in projections much more similar in comparison with the BEBR projections through the year 2030 than when using the 1950-2000 base period. To decide which curve to use to project population, the following factors were considered: 1) the curve fit statistics; 2) how well the curve fit when visually compared to other plots; and 3) how realistic and close the projections were to the 2010, 2020 and 2030 BEBR projections.

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The Gompertz curve with a base period of 1980-2000 was the model used for the population projections. The population estimates calculated by this model match the historical census data and the BEBR projections very well. Staff determined that the Gompertz curve predicts similar increases to those exhibited in the Census historical population data for Leon County and the projections produced by BEBR through 2030. (A Gompertz curve or function is a type of mathematical model characterized by the slowest rates of growth at the beginning and end of a time period. It assumes a confined area for growth to occur within and a limitation on resources within that area.) Staff notes that extreme caution should be exercised when using any long-range population projections.

**5.3.1. Recommended Population Projection Method**

The purpose of this section is to discuss the relative strengths and weaknesses of the various population projection methods. This section also considers specific current and anticipated areas of growth within the USA and outside the USA. Future water demand projections are presented based on the analysis of the various population projection methods and anticipated growth within the USA.

It should be noted that the City provides potable water outside the limits of the USA. However, City staff has indicated that water users located outside the USA and into neighboring Wakulla County account for only 1-2 percent of the total water used by the system. The demand from areas outside the USA is included in total flow numbers reported by the Northwest Florida Water Management District.

Historically, Tallahassee-Leon County Planning Department staff and consultants have used three sources of population data - TAZ, BEBR, and the Census - to develop population estimates and projections. In many cases, these data are blended in an effort to accurately model actual conditions. Analysis of the data, modeling, and discussions with planning staff resulted in the following observations:

- Census data are the backbone of the population projections.
- The current TAZ data utilize the 2000 Census information and 2004 BEBR estimate as its baseline.
- The TAZ data are regularly updated to reflect actual development and development in the planning stage. Although subjective, these updates reflect planning staff's judgment as to the realization of certain development.
- The BEBR data reflect a sharp increase in projected population during the 2004-2006 time frame and similarly sharp decrease from 2006-2009. The BEBR population estimates for 2030 peaked in 2006 at 378,100. The BEBR population projection for 2030 in 2009 is 327,300. A difference of 50,800 people.

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- Since 1970 the population in Leon County as reflected by Census Data has increased at a noticeably steady rate (Table 5-4). Note that this includes population outside the USA.
- A comparison of the most recent (2009) TAZ (Table 5-5) and BEBR (Table 5-6) projections in reflects similar population growth trends to Census data. Again, note these tables include population outside the USA.

**Table 5-4:  
 10-Year Population Growth Rates Using U.S. Census Data**

CENSUS YEARS	YEAR 1	YEAR 10	POPULATION INCREASE
1970-1980	103,047	148,655	45,608
1980-1990	148,655	192,493	43,838
1990-2000	192,493	239,452	46,959

Source: U.S. Census Bureau (2000)

**Table 5-5:  
 Projected 10-Year Population Growth Rates Based on TAZ Data**

YEARS	TAZ YEAR 1	TAZ YEAR 10	POPULATION INCREASE
2000-2010	239,452*	288,233	48,781
2010-2020	288,233	326,198	37,965
2020-2030	326,198	360,390	34,192

Source: City of Tallahassee, Master Sewer Plan Phase 2  
 Population and Wastewater Flow Projection, Hatch Mott MacDonald (2009)

\*Note that this is the 2000 Census population.

**Table 5-6:  
 Projected 10-Year Population Growth Rates Based on BEBR Data**

YEARS	BEBR YEAR 1	BEBR YEAR 10	POPULATION INCREASE
2000-2010	239,452*	275,800	36,348
2010-2020	275,800	301,500	25,700
2020-2030	301,500	327,300	25,800

Source: University of Florida, Bureau of Economic and Business Research (2009)

\*Note that this is the 2000 Census population.

Based on the qualitative analysis presented in Tables 5-4 through 5-6, the most recent TAZ projections contained in the 2009 City of Tallahassee Sewer Master Plan more closely track the historic trend in census data than the 2009 BEBR projections. In addition, the TAZ projections appear to be more stable than the BEBR data which has

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undergone a recent surge and is currently correcting. Consequently, the 2009 TAZ-based population projections are recommended for purposes of projecting water demand.

**5.4. Planned Development in the Urban Service Area**

The Tallahassee-Leon County Planning Department maintains a list of major planned and proposed developments inside the USA. A map prepared by Tallahassee-Leon County Planning Department showing the location of these developments is attached as Appendix D. A breakdown of the units anticipated from these developments and their associated future maximum day (based on 160 gpcd and 2.51 persons per unit or 401 gpd per unit) and average day (based on 100 gpcd or 251 gpd per unit) is provided in Table 5-7.

**Table 5-7:  
 Summary of Major Planned Developments in the USA  
 and Associated Future Water Demand\***

NAME OF DEVELOPMENT	NUMBER OF UNITS	Future Annual Average Day (MGD)	Future Maximum Day (MGD)
Southwood	3,166 (remaining in DRI)	0.79	1.27
Fallschase	1,514	0.38	0.61
Southside	2,800	0.70	1.12
Welaunee	4,819 (Toe and Heel only)	1.21	1.93
Pinnacle	400	0.10	0.16
Summerfield	447	0.11	0.18
Hopkins North	480	0.12	0.19
Collin English	2,000 (est.) (9,350 based on SESP)	0.50	0.80
<b>TOTAL</b>	<b>15,626</b>	<b>3.92</b>	<b>6.27</b>

Source: TLCPD Planning Department Report on Major Planned Developments in the TLCPD Planning Area;

\* Note: No units have been attributed to Welaunee North inside the USA (approx. 1,900 acres), or Welaunee outside the USA inside the City (approx. 2,900 acres).

The Tallahassee-Leon County Planning Department maintains a database of other major projects (over 40 units) planned inside the USA. These amount to an additional 7,011 (approximately) units inside the USA contained in developments that are ongoing or proposed. A breakdown of these units is provided in and their associated future average and maximum day water demand is provided in Table 5-8 (again based on 2.51 persons per unit, 100 gpcd average day demand, and 160 gpcd maximum day demands).

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**Table 5-8:  
 Additional Planned Development in the TLCPD Planning Area and  
 Associated Demand**

	SF Detached	Townhouse	Condo	Multi-Family	Total Units	Future Annual Average Day (MGD)	Future Maximum Day (MGD)
Proposed		56		730	786	0.20	0.32
Under review	348	96		312	756	0.19	0.30
Approved (in subs/projects not yet started)	195	554	298	1,241	2,288	0.57	0.92
Approved (in subs/projects under construction)	924	489	346		1,759	0.44	0.71
Clearing Site	447	120			567	0.14	0.23
Under Construction	96	178	296	285	855	0.21	0.34
<b>Total by Type</b>	<b>2,010</b>	<b>1,493</b>	<b>940</b>	<b>2,568</b>	<b>7,011</b>	<b>1.76</b>	<b>2.81</b>

Source: TLCPD Planning Department Report on Additional Major Projects (over 40 units) Planned in the TLCPD Planning Area.

A comprehensive map showing the location of major ongoing and proposed projects is attached in Appendix D. The map provides a good visual of the planned growth and allows one to easily identify areas of concentrated growth.

By combining the totals in Tables 5-7 and 5-8, the Tallahassee-Leon County Planning Department estimates that the combined number of units coming to the market by 2030 based on existing and proposed projects is 22,637. This translates to an increased annual average day potable water demand of 5.68 MGD and maximum day demand of 9.08 MGD through the year 2030.

An estimate of the persons associated with the 22,637 habitable units can be calculated by multiplying the number of units by 2.51 persons per unit for a total of 56,819 persons. Subtracting these persons from the total TAZ projected population growth of approximately 62,989 people results in approximately 6,170 additional people located in the USA, but not within one of the planned developments. The future maximum day demand for these persons is 0.93 MGD (based on 150 gpcd). The location of these additional persons is unknown at this time. It is anticipated that a portion of these units will come from Welaunee North and Welaunee outside the City. Projects of fewer than 40 units will satisfy some of the anticipated demand. The remainder of the additional demand may be located within City limits in developments of fewer than 40 units.

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Two sets of demand projections are shown in Table 5-9; “Actual” AAD using the 2008 billing data as a base, and TAZ AAD based on TAZ population projections within the USA.

**Table 5-9:  
 Comparison of Actual and TAZ Based Demands (2010-2030)**

YEAR	Increase in Population (inside the USA) <sup>1</sup>	DEMAND (MGD)		
		Incremental Demand Increase	Actual AAD <sup>2</sup>	TAZ AAD <sup>3</sup>
			Cumulative	Cumulative
2010	0	0	26.63	39.58
2015	18,674	1.87	28.50	41.54
2020	14,771	1.48	29.98	43.09
2025	14,772	1.48	31.46	44.64
2030	14,772	1.44	32.90	46.19
<b>TOTAL</b>	<b>62,989</b>	<b>6.27</b>		

1. Incremental population increase within the USA based on TAZ population projections in Table 5-1.
2. Base Actual AAD is based on 2008 billing data.
3. Base TAZ AAD is based on 2010 TAZ population times 157 gpcd

The numbers in Table 5-9 do not account for system losses and abnormal usage, which staff have indicated to be in the range of 10-15 percent. Also note that the TAZ 2010 demand projection of 39.58 MGD is substantially higher than the 26.63 MGD based on actual billing data. This is due to the TAZ projection including the population for all of the residents within the USA, including the residents supplied by private wells and by Talquin. The actual AAD was calculated using the 2008 demand as a base and then adding the incremental increases in population provided by the TAZ projections (See Section 8). The Actual AAD projections were also used to construct the hydraulic model.

Both demand projections above differ from those of the NFWWMD (Table 4-2) because the NFWWMD projections rely on population projections developed when growth was occurring more rapidly and have not be corrected for the recent downturn. As a result the NFWWMD projections are on the high side in the years prior to 2030, whereas the demand projections included in this report are based on more recent population estimates which account for the recent downturn in growth.

Figure 5-1 and Table 5-10 present historic and projected AAD by a variety of methods. Of significance are two observations. First, the 2008 actual AAD was the lowest consumption in more than 10 years; however it was the most recent data available for this Master Plan. It is likely that a more representative AAD would be higher than the 2008 data. Second, the 2030 AAD projections by the NFWWMD and using TAZ are very similar – approximately 44 MGD and 46 MGD, respectively.

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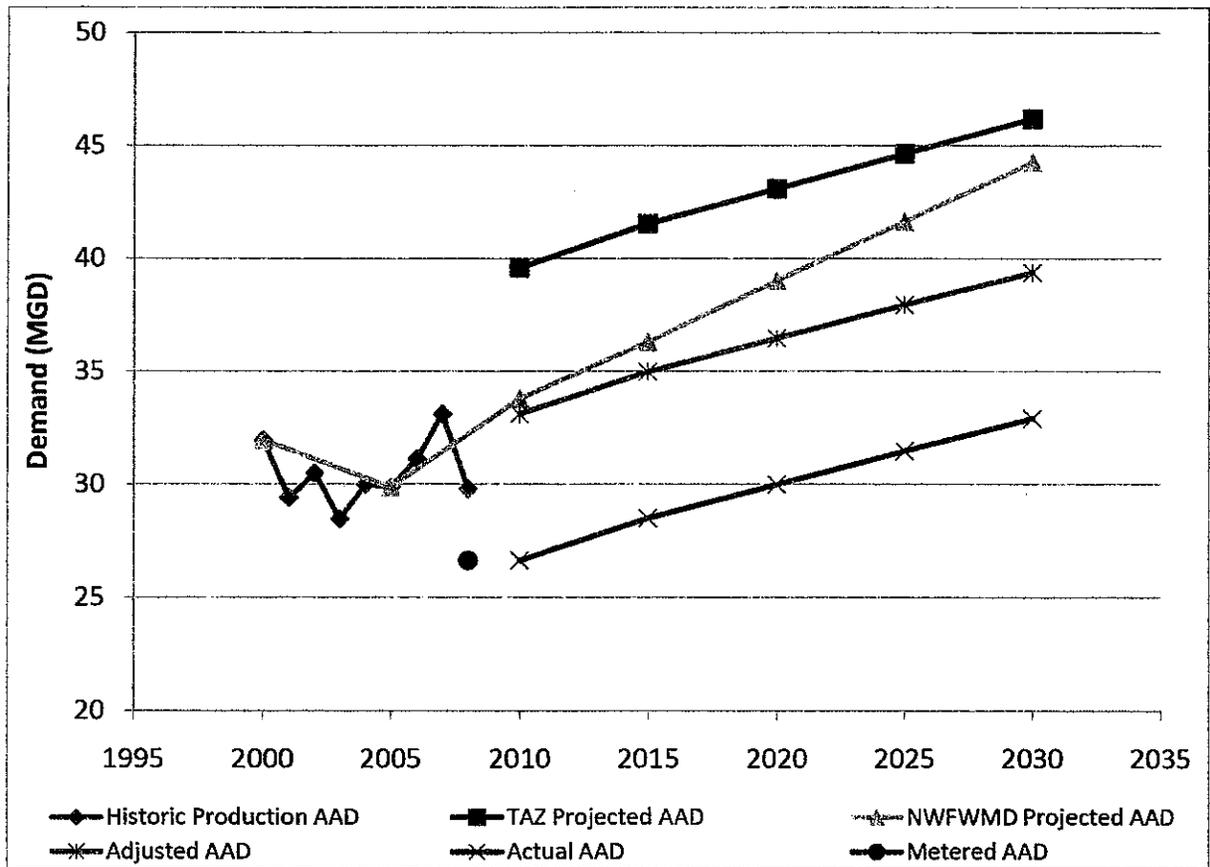


Figure 5-1: Historic and Projected Demand Patterns

Table 5-10:  
 Comparison of Actual and TAZ Based Demands (2010-2030)

YEAR	DEMAND PROJECTIONS (MGD)			
	Actual AAD	TAZ AAD	Adjusted AAD	Adjusted Max Day <sup>2</sup>
2010 <sup>1</sup>	26.63	39.58	33.10	49.65
2015	28.50	41.54	34.97	52.46
2020	29.98	43.09	36.46	54.68
2025	31.46	44.64	37.94	56.90
2030	32.90	46.19	39.37	59.06

1. The 2010 Actual projection is based on the 2008 consumption data. The 2010 TAZ projection is based on the TAZ population projection. The 2010 Adjusted projection is based on the 10 year maximum consumption.
2. The Adjusted maximum day demand is calculated by multiplying the Adjusted AAD by a factor of 1.5

#### 5.4.1. Consumptive Use Permit

The City's existing Consumptive Use Permit (CUP) was issued on February 23, 2006 and expires on March 1, 2011. The CUP establishes the following permitted capacities:

1. Combined average annual withdrawal of 33,700,000 gallons per day.
2. Maximum combined withdrawal of 59,310,000 gallons during a single day.
3. Combined monthly withdrawal of 1,415,400,000 gallons.

The use of TAZ-based demand projections as a basis for future CUP projections results in AAD and maximum day demand projections that are unrealistically high due to the inclusion of Talquin customers and currently unserved areas. Conversely, the use of the 2008 actual AAD as a basis for future CUP projections, likely results in projections that are unrealistically low. Therefore an adjusted AAD needs to be selected so that it is more in line with the observed historic values. Based on this observation it seems reasonable to use the highest historic annual average demand shown on figure 5-1, which is 33.1 MGD, as the starting point for future CUP projections. The "Adjusted AAD" is then used as the base demand and then increases demand incrementally in proportion to the TAZ projections. The base Adjusted demand (33.1 MGD) is slightly less than the current permitted average annual daily withdrawal. Based on the projections in Table 5-10, the projected 2015 AAD of 34.97 is larger than the permitted annual average withdrawal. However, the projected 2015 maximum day demand of 52.46 MGD, the AAD multiplied by a factor of 1.5, is less than the permitted maximum day withdrawal. The Adjusted AAD projections can be used by the City as the basis for the CUP renewal. At a minimum, it likely will be necessary to modify the CUP annual average day capacities in the near future. A copy of the CUP is provided in Appendix E.

#### 5.4.2. Target Water Service Areas

There are three specific geographic areas, Woodville Community, Centerville Trace and Harbinwoods Subdivisions, called "Target Areas" in the USA. Woodville receives a portion of its water demands from the City, but discharges no wastewater to the City. Centerville receives all of its water demand from the City, but similarly discharges no wastewater. Finally, Harbinwoods neither receives City water, nor discharges wastewater to the City. Per the Comprehensive Plan, the City must plan to provide water to the Target Areas. The Target Areas are included in the population projections of the USA, and thus accounted for in the demand projections.

#### 5.4.3. Anticipated Direction of Planned Development

Over the past 30 years, the northeast quadrant of the City has seen the most growth. This has begun shifting to the Southeast since 2000 due to Southwood and the Southside developments - both developments of regional impact (DRI). The Comprehensive Plan tends to indicate that this trend will continue. The urban fringe land use category is found predominantly in the Southeast quadrant of the County. These are areas designated

**Section 5  
 Projected Water Demands**

for expansion of the USA and future urban style growth. The Northeast is constrained to some extent by current land use designations. A copy of the Future Land Use Map is attached in Appendix F.

Particularly instructive is Appendix D which reflects that the four (4) major projects will continue to drive development in the Southeast quadrant of the USA. These projects are Southside, Southwood, Collin English, and Fallschase (bordering on the southeast quadrant). Together these account for 60.7% of the major planned development growth anticipated to occur in the County.

Another indicator of growth in the southeast quadrant of the City can be observed by the roadway projects planned for each approximate quadrant of the City. The Tallahassee-Leon County Planning Department divides the County into ‘Significant Benefit Zones’ for purposes of roadway improvement projects. These zones align roughly with the quadrants of the City. A map prepared by Tallahassee-Leon County Planning Department staff describing these projects and delineating the zones is attached as Appendix G. Table 5-11 is a summary of anticipated cost of the planned roadway projects.

**Table 5-11:  
 Anticipated Cost of Roadway Projects by City Quadrant**

Significant Benefit Zone	I (NE)	II(SE)	III (SW)	IV (NW)
Total Estimated Cost of Roadway Projects	\$40 million	\$110.5 million	\$55 million	\$49 million

Source: TLCPD, “Significant Benefit Zones” anticipated roadway projects and funding.

The data indicate that over twice as much money will be spent on major roadway improvements in Zone II (the approximate SE zone) of the City than any other. This provides an additional insight as to direction of growth.

# 11. Conclusions, Recommendations and Capital Improvement Plan

## 11.1. Conclusions

The majority of the improvements identified in this Water Master Plan Update are driven by future growth, and as such the timing of those improvements is ultimately driven by when that growth occurs. The CIP presented is intended to serve as a budgeting tool. The City will need to monitor growth and may need to adjust the CIP schedule and timing of certain projects as growth occurs. For example, growth in one development may occur more quickly than projected, and as such, certain improvements may need to happen sooner than indicated. On the other hand, growth may not return as quickly as projected, meaning certain projects can be delayed.

For consistency with other planning efforts and because TAZ projections have historically been the most representative growth in the Tallahassee area, the population and water demand estimates in this Water Master Plan Update are based upon TAZ projections. A summary of projected future population and water demands for the period of 2010-2030 is provided in Table 11-1.

**Table 11-1:  
 Population and Water Demand Projections (2010-2030)**

YEAR	Increase in Population per TAZ (inside the USA) <sup>1</sup>	DEMAND (MGD)			
		Actual AAD	TAZ AAD	Adjusted AAD	Adjusted MDD <sup>2</sup>
2010	0	26.63	39.58	33.10	49.65
2015	18,674	28.50	41.54	34.97	52.46
2020	14,771	29.98	43.09	36.46	54.68
2025	14,772	31.46	44.64	37.94	56.90
2030	14,772	32.90	46.19	39.37	59.06
<b>TOTAL</b>	<b>62,989</b>				

1. The 2010 Actual projection is based on the 2008 consumption data. The 2010 TAZ projection is based on the TAZ population projection \* 157 gpcd. The 2010 Adjusted projection is based on the 10 year maximum consumption.
2. The Adjusted max day demand is calculated by multiplying the Adjusted AAD by a factor of 1.5

Section 11  
Conclusions, Recommendations and Capital Improvement Plan

The City's existing consumptive use permit (CUP) establishes the following permitted capacities:

1. Combined average annual withdrawal of 33,700,000 gallons per day
2. Maximum combined withdrawal of 59,310,000 gallons during a single day
3. Combined monthly withdrawal of 1,415,400,000 gallons.

The use of TAZ-based demand projections as a basis for future CUP projections results in AAD and maximum day demand projections that are unrealistically high due to the inclusion of Talquin customers and currently unserved areas. Conversely, the use of the 2008 actual AAD as a basis for future CUP projections, likely results in projections that are unrealistically low. Therefore an adjusted AAD needs to be selected so that it is more in line with the observed historic values. The "Adjusted AAD" is then used as the base demand and then increases demand incrementally in proportion to the TAZ projections. The base adjusted demand (33.1 MGD) is slightly less than the current permitted average annual daily withdrawal. Based on the projections in Table ES-2, the projected 2015 AAD of 34.97 is larger than the permitted annual average withdrawal. However, the projected 2015 maximum day demand of 52.46 MGD, the AAD multiplied by a factor of 1.5, is less than the permitted maximum day withdrawal. The adjusted AAD projections can be used by the city as the basis for the CUP renewal. At a minimum, it likely will be necessary to modify the CUP annual average day capacities in the near future.

There are no strict guidelines for performance of a calibration in terms of goodness-of-fit between modeled and measured data. The calibration results for the Tallahassee model fall within the suggested goodness-of-fit ranges. The results at each of the storage tanks were very good, with predicted tank levels falling within the standard of  $\pm 6$  feet. The majority of final modeled flows were within 2% of the measured values.

The calibration process provided many insights into the operation of the Tallahassee distribution system. Overall, the calibration resulted in a model that will effectively serve to address the goals of the Water Master Plan, and enable the City to effectively evaluate distribution system operation and improvements in the future.

## 11.2. Recommendations

The proposed improvements are shown on Figure 11-1, are numbered and correspond to the CIP project numbers in Table 11-2.

### 11.2.1. Future Capacity Growth Improvements

Projected future water demand will result in the need for relatively minor improvements to the water system. Based on a detailed review of the system and projected water demands from 2010 to 2030, the following improvements are recommended:

Conclusions, Recommendations and Capital Improvement Plan

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- Installation of a 2,500 gpm water supply well (Well 35, already planned with Southwood DRI).
- Installation of a 2,500 gpm water supply well (Well 32, redundancy for Well 25).
- Complete water main replacement project near Interstate 10 and County Road 148B/Thomasville Road (in construction).
- Prior to 2020, install a new 500,000 gallon elevated storage tank in the northwest quadrant of the system.
- Prior to 2020, install a new 1,500 gpm water supply well in the eastern portion of the City's service area.
- Prior to 2020, modify controls at Well 23 and 26 and/or complete one of the following:
  - Add greensand treatment at Well 23 (allows wells to operate simultaneously).
  - Add a new well that includes greensand treatment in the northwest quadrant (allows Well 23 and 26 to continue to be rotated).
  - Replace 3.5 miles of existing 6-, 8-, and 10-inch piping running east to west along Mahan and Call, on either side of downtown with 12-inch mains.

**11.2.2. Target Areas/Areas of Concern/Fire Flow Improvements**

The Areas of Concern and results of the fire flow analysis produced a need for additional relatively minor improvements to the water system. The following improvements are recommended:

- Installation of 500 ft of 6-inch pipe from Pottsdamer Road into Pennell Circle to aid with fire flow pressure.
- Installation of 1.5 miles of 8-inch pipe to loop the Highway 90 West fire flow issue. The loop will go south on Barineau Rd from the existing pipe in Highway 90 and east on Highway 20 to connect to the existing pipe.

**11.2.3. Downtown Infrastructure Improvements**

Additional investigative work will assist in prioritizing water mains in the downtown area for replacement or rehabilitation, and help to ensure water supply and fire flows to the downtown area. Short of that investigative work, it is recommended that the first phases of the project include the replacement of 2 and 4-inch (if necessary) and the 6-inch water mains with 8-inch diameter pipelines until completion. Upon completion of this phase, the larger diameter pipelines starting with 8-inch is to be addressed for rehabilitation or replacement.

The downtown area infrastructure replacement has, at this time, been scheduled over a 13-year period beginning in 2011 to allow time for inclusion in the City's capital budget (for fiscal year 2011). The City Auditor acknowledged this in the 2009 report that

Conclusions, Recommendations and Capital Improvement Plan

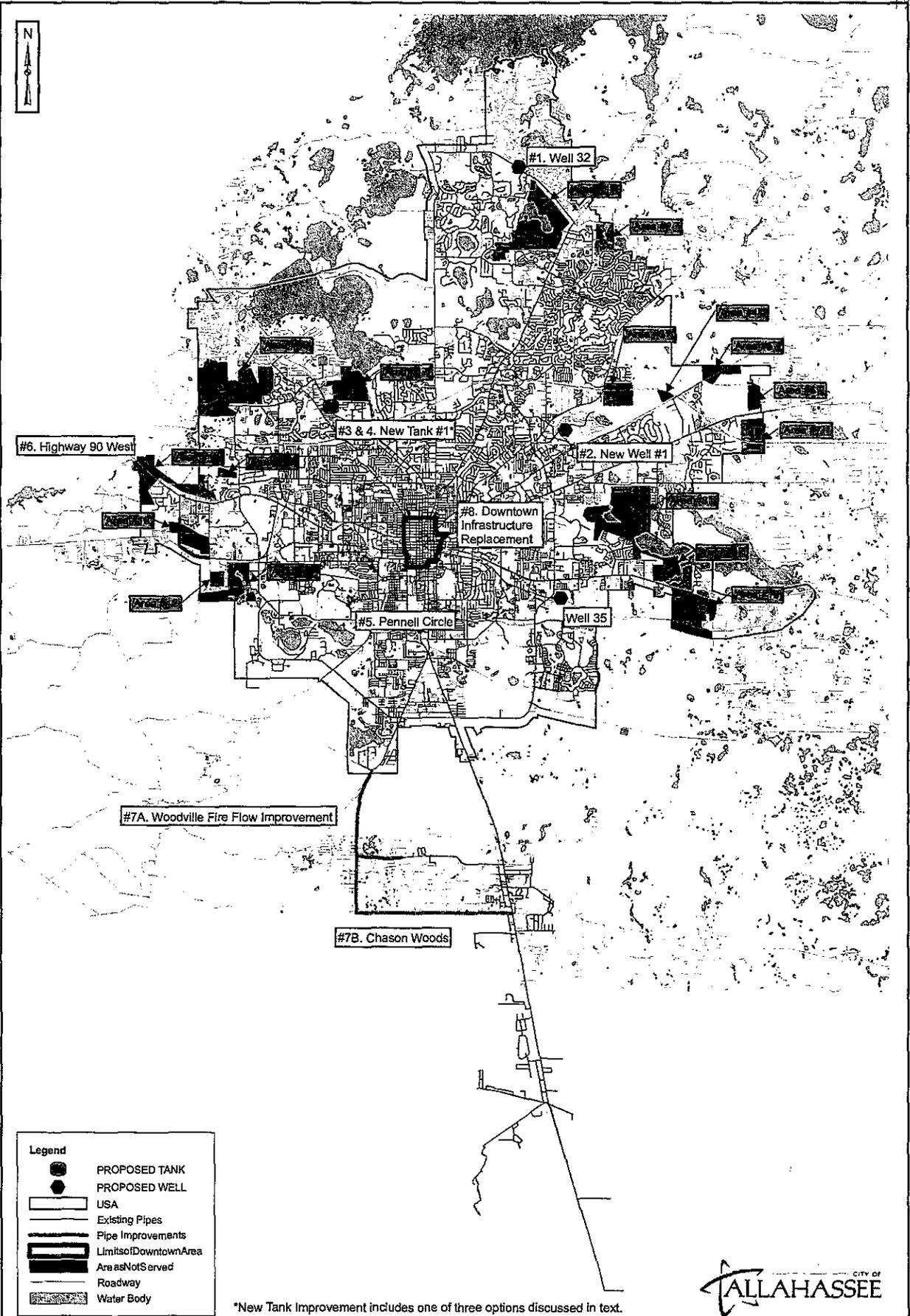
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directed the Water Utility to develop “a viable plan for replacing and upgrading the City’s aging downtown water infrastructure.” The Auditor recommended that that plan be followed once it is developed “to the extent funding is available.” Section 10 discusses a number of funding alternatives available to the City to help in keeping that plan on track.

### 11.3. Capital Improvement Plan

Table 11-2 presents a recommended 20-year capital improvements plan. The plan contains needed capacity and operational improvements during the planning period based on analyses presented in this report. It envisions an investment of more than \$15 million dollars for Downtown Infrastructure replacement. The plan also includes discretionary funding for areas associated with Hwy 90 West improvements and the Welaunee development. Actual funding appropriations for these areas will be evaluated during future updates of the Water Master Plan. Expansions into other unserved areas included in Section 8 (including the Woodville southern loop - Project 7B) have not been included in the CIP as these expansion would be funded based on financial feasibility, and development trends and needs. It also should be noted that this assumes developers will be responsible for the cost and construction of infrastructure within specific developments. A map depicting the general location of the projects in the CIP plan is included in Figure 11-1.





\*New Tank Improvement includes one of three options discussed in text.

**Legend**

-  PROPOSED TANK
-  PROPOSED WELL
-  USA
-  Existing Pipes
-  Pipe Improvements
-  LimitsofDowntownArea
-  AreaNotServed
-  Roadway
-  Water Body



**Attached is Additional Information for  
Workshop Item**

**Workshop on the City of Tallahassee's Updated  
Water and Sewer Master Plans in Accordance with  
the Water and Sewer Agreement between the City of  
Tallahassee and Leon County**

**Tuesday, December 14, 2010  
12:00 p.m. – 1:30 p.m.**

**This document distributed December 10, 2010**



**Board of County Commissioners  
Leon County, Florida**

www.leoncountyfl.gov

**Workshop Request  
Executive Summary**

December 14, 2010

**Title:**

Additional Information for the Workshop on Approval of the City of Tallahassee's Updated Water and Sewer Master Plans

**Staff:**

Parwez Alam, County Administrator  
Alan Rosenzweig, Assistant County Administrator  
Tony Park, P.E., Director of Public Works

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**Issue Briefing:**

Per the request of Commissioner Proctor, additional information for the Workshop on the City of Tallahassee's updated Water and Sewer Master Plans is being provided. The additional information contemplates the expansion of the Woodville study area and the cost associated with a potential expansion (Attachment #1).

**Fiscal Impact:**

Expansion of the Woodville study area into the sectors identified would increase the cost by \$16 million.

**Analysis:**

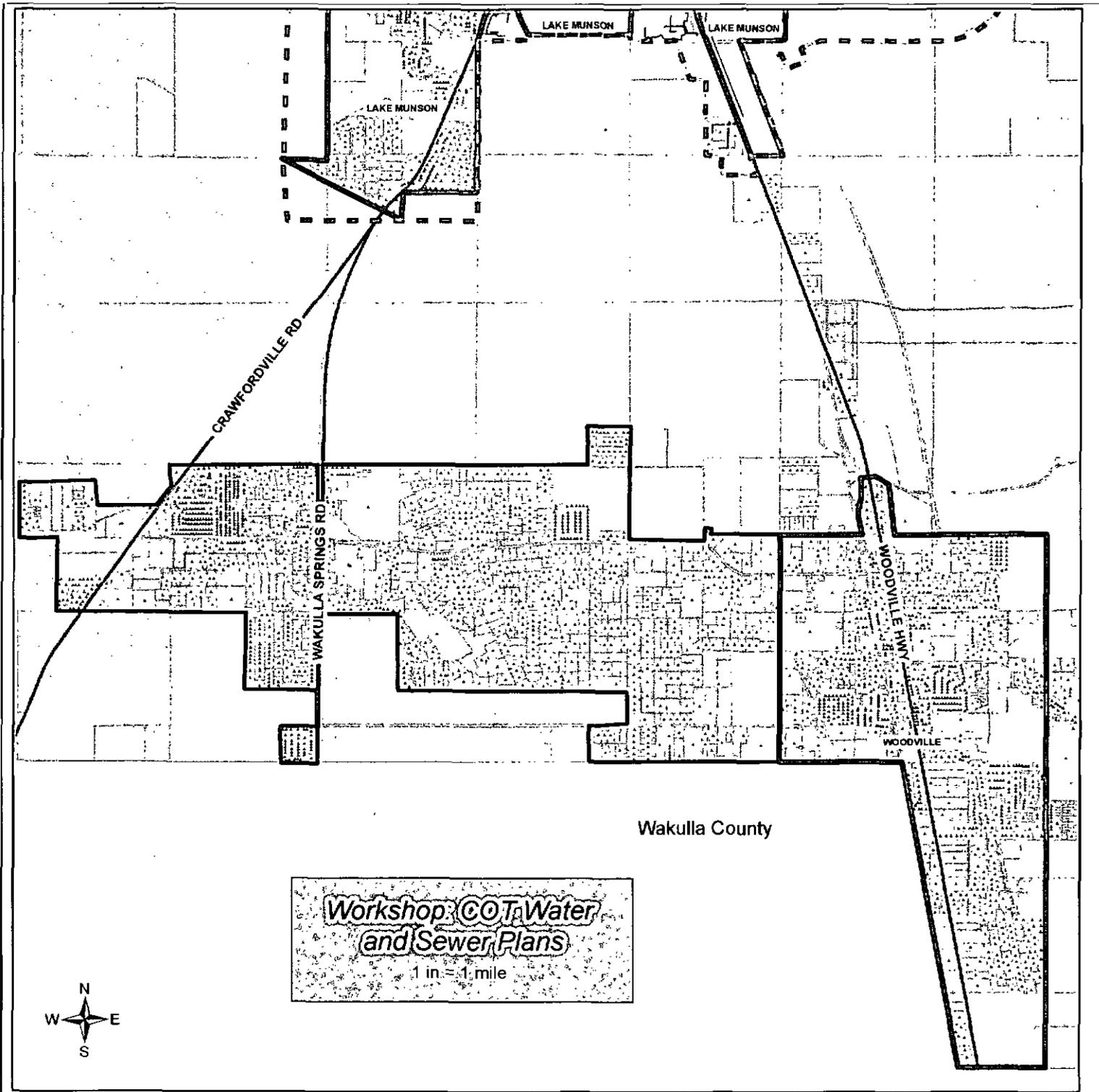
<b>Table 1: Additional Area/Expansion of Woodville Study Area</b>			
	Cost/Lot	# Lots	Cost
East of Wakulla Springs Rd. to Woodville Study Area Boundary	12,000	692	\$8,304,000
West of Wakulla Springs Rd.	12,000	644	\$7,728,000
Total Additional Cost		1,336	\$16,032,000

**Attachment:**

1. Map Identifying Additional/Expansion Areas

PA/AR/TP/LD/djw

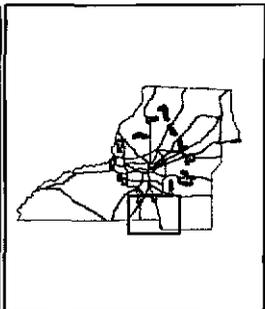
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**Workshop: CO's Water  
and Sewer Plans**  
1 in. = 1 mile

Wakulla County

- |                               |  |
|-------------------------------|--|
| ▲ Septic Tanks                | ~ Major Roads                          |
| ⊕ Study Areas                 | ⊕ Talquin Water and Sewer Service Area |
| ⊕ County Identified Areas     | ⊕ Talquin Water Service Areas          |
| ⊕ Urban Service Area Boundary | ○ City Limit                           |
| ⊕ Additional Areas            | ⊕ County Boundary                      |
|                               | — Sewer Lines                          |



**DISCLAIMER**  
NOTE: This product has been compiled from the most accurate source data from Leon County, the City of Tallahassee, and the Leon County Property Appraiser's Office. However, this product is for reference purposes only and is not to be construed as a legal document or survey instrument. Any reliance on the information contained herein is at the user's own risk. Leon County, the City of Tallahassee, and the Leon County Property Appraiser's Office assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

Map created on December 9, 2010  
by Tricia McCreath  
Tallahassee- Leon County GIS  
Telephone: (904) 606-1529  
Web: <http://www.lcgsa.org>

