Chapter 11 – Water Resources, Supplies and Demand

11.0 Key Points

Key Points

- The WRWSA – Detailed Water Supply Feasibility Analysis offers the Authority and its members a detailed plan and menu of options for future water supply planning and development. This chapter discusses the logical progression of demand reduction and water supply development in the region.
- Menu alternatives include demand reduction initiatives such as conservation and the beneficial use of reclaimed water. Regulatory and incentive measures have been implemented by the SWFWMD and the SJRWMD to encourage both of these approaches.
- Other options include the development of traditional groundwater supplies, both local and dispersed, and alternative water sources such as surface water and seawater desalination.
- Collaboration and regionalization of water supply development can have substantial benefits for member governments from a regulatory, environmental, public health & safety and economic standpoint.
- WRWSA plan elements and projects for consideration have been categorized into short (0-20 years), mid (15-35 years) and long-term (30-50 years) from a timing perspective.
- The availability of groundwater and actual growth rates of WRWSA members will dictate when these alternatives will be required.
- WRWSA members with high adjusted per capita rates must address them through demand reduction initiatives in light of compliance per capita rates required by SWFWMD and contemplated by SJRWMD.
- Water demand reduction due to implementation of compliance per capita rates is significant within the WRWSA and will result in extending existing water supplies and delaying the need for AWS.
- Short-Term water supply planning and development will entail water conservation, reclaimed water projects, and dispersed wellfield development, possibly including the City of Wildwood and The Villages.
- Mid-Term water supply planning and development will include additional development of dispersed wellfields within Marion County and the interconnection of existing water systems to maximize water production, provide necessary backup and prepare for the introduction of AWS.
- Long-Term water supply planning and development will identify and develop the appropriate AWS project(s) and continue the construction of interconnections to supply the water to customers. This will complete a multi-source, conjunctive use water supply system.

11.1 Introduction

The purpose of this chapter is to analyze the water supply needs and sources within the WRWSA. The WRWSA – Detailed Water Supply Feasibility Analysis has reviewed the technical aspects of water supply planning including population and water supply projections; an assessment of groundwater availability; conceptual water supply projects; the potential role for water conservation and beneficial reuse; and a water supply project ranking. This section of the report discusses the logical progression of water demand reduction and water supply development within the WRWSA. It analyzes water availability and supply strategies in the region and recommends a logical short-term, mid-term and long-term strategy for water supply development and potential partnerships in the region.

This analysis will offer the WRWSA and its members a menu of options and potential opportunities for water demand reduction and regionalizing water supply development in the WRSWA. It is a jumping off point to begin the development of the proposed WRWSA Regional Water Supply Framework that is detailed in Chapter 12. It also provides a platform from which conceptual projects, from a planning perspective, can be discussed with regulators to determine their applicability and permittability in meeting future water demands. This chapter also attempts to identify potential regional projects within the WRWSA which may be programmed within the identified short-term, mid-term and long-term planning horizons.

11.2 Water Conservation

The role of water conservation in meeting future water demands within the WRWSA is of increasing importance. Water conservation has been promoted by the water management districts as the most cost-effective method of extending current water supplies to meet existing and future demands. This has become even more critical as traditional groundwater sources are limited by environmental and water resource constraints. Water conservation is also a mandatory approach as compliance per capita rates have been instituted by the SWFWMD and are being considered by the SJRWMD.

The water savings within the WRWSA with an aggressive water conservation program can be significant. To gain a generalized look at potential water savings, the unadjusted per capita rates are compared to the compliance per capita rates that must be met by 2018 (Table 11-1). Knowing that unadjusted per capita rates do not reflect a community's beneficial use of reclaimed water, stormwater or other AWS, the following savings may be high; but most communities in the WRWSA are not using significant amounts of lower quality sources. The table gives the potential high end of the water savings that will occur with communities instituting comprehensive conservation initiatives to meet their individual compliance per capita requirements by 2018, assuming that the per capita requirements are not offset by new unregulated irrigation wells.

Within the WRWSA portion of SWFWMD a large number of communities have unadjusted per capita rates that exceed the required compliance per capita rate of 150 gpcpd. Of the 40 major utilities within the WRWSA 26 or 65% of these exceed the compliance per capita requirements. When the compliance per capita rate is applied to the projected population increase for these utilities alone, a potential water demand reduction of approximately 15 mgd is realized.

Table 11-1. Potential Demand Reduction for SWFWMD Utilities with Per Capita Use >150 gpcpd.

Projected 2030 Demand at 2005 GPCD (mgd)	Projected 2030 Demand at 150 GPCD (mgd)	Potential Demand Reduction (mgd)
77.62	62.34	15.29

Note:
Utilities included for this calculation are: City of Crystal River (207), City of Inverness (419), Citrus County & WRWSA (7121), Citrus Springs / Pine Ridge (2842), Sugarmill Woods (9791), Rolling Oaks Utilities Inc. (4153), Walden Woods LTD (11839), Hernando County Water and Sewer (2179), City of Bushnell (6519), City of Wildwood (8135), The Villages (13005, 12236, 11404), Marion County Utilities (6151), Quail Meadow (8165), Marion County Utilities (11752), Spruce Creek (12218), Marion Utilities Inc (2999), Marion Utilities Inc (7849), Spruce Creek (8481), On Top of The World Communities Inc (1156), Rainbow Springs Utilities LC (4257), Century Fairfield Village LTD (8005), Marion Landing HOA (8020), City of Dunnellon (8339), Windstream Utilities Co (9360), and Upcharch Marinas - Sweetwater (9425).

Water conservation must be the first initiative that is analyzed and utilized by utilities as they plan for their future water demands. Demand reduction historically has not been a priority of utilities in Florida but the benefits of conservation are now being understood. Since water conservation standards within local building codes were revised per capita rates on new construction were positively affected. As reported in Chapter 4 – Water Conservation, residential water usage in the United States has declined to 83 gpcpd, in large part due to conservation efforts, public education and water conserving standards in building codes (USGS 2005).

The water conservation inventory of WRWSA members addresses areas where conservation initiatives have or have not been implemented (Table 4-1). As mentioned, this inventory is more qualitative in nature, however, highlights where potential opportunities for water savings can be further evaluated. These initiatives have been included in the inventory based on their potential positive impacts on lower water usage.

The WRWSA's has historically funded water conservation initiatives for member governments. The process was one of institutionalizing conservation in the region. Funded conservation initiatives have included dedicated conservation staff (Hernando County and Citrus County) the current WRWSA and SWFWMD cost-share funding cycle will include a regional conservation initiative focusing on reduction of irrigation demands.

The SWFWMD Model that is also described in Chapter 4, is an opportunity for all WRWSA member governments to analyze, update and fine-tune their water conservation programs. The WRWSA can play an important role for its members in facilitating the education and utilization of the SWFWMD Model. The members with the higher compliance per capita rates should be prioritized and opportunities for cost effective conservation initiatives pursued. The WRWSA can use the information generated from the SWFWMD Model to help in formulating its Regional Conservation Funding Program and the SWFWMD Cooperative Funding Initiative. Utilization of the SWFWMD Model will help ensure a more effective program targeting high per capita rates within the WRWSA.

11.3 Reclaimed Water

Opportunities for reclaimed water projects that offset potable water needs are discussed in Chapter 5. Conceptual projects have been generated and project costs have been estimated.

The best of these projects are second only to water conservation in terms of cost-effectiveness. Overall, beneficial reuse percentages from existing and new wastewater treatment plants will only increase over time as demands for non-potable irrigation supplies increase and the availability of potable supplies decrease.

Many utilities in the region now have special conditions in their permits which require detailed consideration of new beneficial reuse supplies. The deployment of these projects will be further incentivized by WMD cost-share funding initiatives (SWFWMD funds beneficial reuse at 50%; SJRWMD at 20%).

The overarching need is for beneficial reuse to be aggressively developed in areas where resource impacts are projected; where high compliance per capita rates occur; and where significant potable water offsets can be achieved in a cost-effective manner. A model for this is the Hickory Hill project in Hernando County, where cost-share funds and water use permit criteria were coordinated to offset X MGD of projected potable water demand – in an area where resource impacts have been projected. A second model is The Villages area, where reclaimed water has been imported from locations in both Lake and Marion Counties due to projected resource concerns and The Villages' achievement of a high rate of potable offset.

As recommended with conservation initiatives, reclaimed water projects should be prioritized in a logical manner: they should focus on areas where resource impacts are projected; where high compliance per capita rates occur; and where significant potable water offsets can be achieved, in a cost-effective manner. The WRWSA can assist and advocate for those member governments who seek funding from the SWFWMD and SJRWMD Cooperative Funding Programs. A Reclaimed Plan should be developed. The Reclaimed Plan would analyze and prioritize projects that are cost-effective and will have the greatest impact on offsetting the development of new water sources and lowering high compliance per capita rates within the WRWSA. The Reclaimed Plan would be developed in cooperation with member governments. The Reclaimed Plan would develop both priority projects and detailed multi-year budgets for a 10-year period. The Reclaimed Plan would be updated on an annual basis and would be submitted together with member government's SWFWMD Cooperative Funding Initiative applications to demonstrate that those specific reclaimed projects fit into a regional reclaimed water strategy.

11.4 Regional Approaches to Water Supply Planning and Development

Water supply permitting and development is becoming increasingly more difficult in all areas of the State of Florida. This is in part due to better technology and science that is available to estimate the availability of water supplies. It is also a function of the quality and quantity of data that has been collected on water resources including groundwater and surface water. Another factor in the complexity of water allocation is the increased competition for traditional groundwater resources that in many areas are considered in short supply or over taxed.

Regionalization of water supplies is a concept that is gaining popularity throughout the State of Florida because of numerous benefits associated with this approach. The Florida Legislature mandates the regionalization of AWS if local governments seek funding from state sources through the "Water Protection and Sustainability Act" of 2005. SWFWMD rates regional projects more highly on priority list through the District's Cooperative Funding Initiative.

SWFWMD consults with the local water supply authority in the area of a proposed project to ensure that it fits or does not conflict with their individual water supply plan.

A regional approach can take many forms. Regionalization can be a collaborative project between numerous local governments or a more sub-regional approach with as little as two municipalities. The motivation and benefits can be different for each local government or utility but can include the following.

Protection of Water Resources and Environment:

Development of water supplies can often be completed in a more environmentally responsible manner if reviewed and designed on a regional basis. For example, the ability to disperse groundwater withdrawals over a larger area and reduce the water resource and environmental damage from drawdown to the aquifer is a benefit. Regional approaches can afford the opportunity for greater land areas within multiple jurisdictions for water supply development.

Cost Effectiveness:

Economies of scale can often make water supply development more cost effective when approached regionally. The ability to share in the planning, design, construction and operation and maintenance of facilities can lower the cost of water to customers

Reduced Competition:

Collaborative water supply planning and development will reduce the competition for scarce remaining water resources.

Safety:

Redundancy and backup supplies in a water system is essential for public health and safety. Regionalization of water supplies can enhance this aspect of water supply delivery.

Funding:

As mentioned, regionalized water supply development for AWS is a prerequisite for funding through the “Water Protection and Sustainability Act” of 2005. Also the potential for funding through the SWFWMD Cooperative Funding Initiative can be strengthened if a project is regional in nature.

Other Incentives:

Collaborative efforts between member governments have increasingly become an effective approach for the development of water supplies in areas of declining water resources. Other regional water supply authorities within the SWFWMD have taken a proactive role in promoting the collaborative development of water supplies.

Tampa Bay Water (TBW) is the regional supplier for the Tampa area. TBW represents six (6) local governments in the region including Hillsborough, Pasco and Pinellas Counties and the Cities of New Port Richey, St. Petersburg and Tampa. The regionalization of water supplies

within TBW has developed and evolved over the approximately 30-years since their creation but today includes a system that relies on groundwater, surface water and desalinated water sources. The TBW system is also highly interconnected which allows for better operation and management of the system with respect to protecting the environmental features and water resources of the Tampa Bay area. This approach has allowed TBW to maximize the available water resources in the region

11.5 Short-Term Water Supply Planning and Development (1 – 20 Years)

For the sake of this water supply planning effort, Short-Term chronologically is characterized as a 1 to 20-year planning horizon. Within this timeframe nearly all WRWSA members will be affected by compliance per capita rates, other more stringent conservation regulations, and special permit conditions requiring alternative or non-local supplies.

The WRWSA has historically played a role in programming water conservation for member governments. The process has been one of establishing the institutional groundwork from which aggressive conservation will be deployed in responses to compliance per capita rates and other new conservation regulations. This deployment will occur within the Short-Term timeframe. The WRWSA's role in programming water conservation will continue with the regional irrigation audit program and should be expanded over the Short-Term until member communities have developed the ability to fine tune individual demand reduction efforts.

New beneficial reuse supplies will be developed over the Short-Term in response to special conditions in permits and WMD funding incentives. The overarching need is for beneficial reuse to be developed in a logical manner thus achieving the most benefit for the dollar spent in the region. The WRWSA can assist and advocate for those member governments who seek funding from the SWFWMD and SJRWMD Cooperative Funding Programs through the development of a Reclaimed Plan which would prioritize and program beneficial reuse projects in order to advocate for funding.

WRWSA water supply projects programmed for the Short-Term are the dispersed wellfields geared to members who will likely require additional non-local supplies even with the implementation of additional conservation and beneficial reuse. The main Short-Term project is the Sumter wellfield. The specifics of the implementation of this project will be identified in the next few years depending on actual population growth and the results of field data collection. It will likely involve service to The Villages and the City of Wildwood.

Water supply permitting and development are becoming and will continue to become more difficult in all areas of Florida. Competition for traditional groundwater resources will continue to intensify since many areas are now considered in short supply or over taxed. The WRWSA is gradually assuming a larger role in educating and coordinating water issues among members. As these issues become more and more complex over the Short-Term, the WRWSA should continue to assume an educational role. This function should include an annual summary of water use, permits and supply development activities in the region as well as 5-year updates to the water supply plan. The WRWSA TRC has been instrumental in identifying issues for consideration, determining strategy, and disseminating information. The TRC should meet on an annual basis and continue to be gathered periodically as pertinent issues arise.

11.6 Mid-Term Water Supply Planning and Development (15 – 35 Years)

For the sake of this water supply planning effort, Mid-Term chronologically is characterized as a 15 to 35-year planning horizon. The timeframe is intended to overlap with the Short-Term because actual growth will determine when each period occurs. Entering into this timeframe the low hanging fruit in water conservation and beneficial reuse will largely have been gathered. As growth occurs there will be some opportunities but the dramatic gains occurring in the Short-Term will not continue to be realized. More efficient rates of potable water use will have been achieved, successfully extending the life of fresh groundwater to the Mid-Term.

During this Mid-Term timeframe, fresh groundwater supplies will diminish in most of the region. Larger WRWSA members including Ocala will need to implement dispersed groundwater projects such as the Northwestern Marion wellfield. Smaller members will implement remaining conservation and beneficial reuse opportunities and carefully optimize withdrawals. Reliability of member systems and groundwater source issues with connecting new service areas will become a key concern as withdrawals are capped by the WMDs.

Interconnects between distribution systems will be needed for backup and dependability as it becomes more cost-effective to backup systems or rotate wells than to add potable alternative sources. Key interconnects will be needed among the larger systems on either side of the Withlacoochee River. A few of the larger interconnects are likely to be:

- An interconnect between Citrus County's northern and southern service areas;
- An interconnect between southern Citrus County and future utility service in northern Hernando County; and
- An interconnect between southern Marion County and the City of Wildwood and Villages system which will already have been interconnected.

Smaller interconnects are likely among systems such as Floral City and Inverness, and the southern Marion County service areas.

During the Mid-Term timeframe, the WMDs will likely have implemented area wide restrictions on new groundwater withdrawals in the WRWSA region. Rivers and springs in the WRWSA will not have been harmed by withdrawals since their MFLs will have already been adopted ahead of time. In the Tampa Bay area where natural resources had already been harmed prior to rule making, a costly crisis level response was needed in response to the area wide restrictions. In the WRWSA region, advance planning strategies may be used to optimize the region's systems and avoid a crisis level situation.

11.7 Long-Term Water Supply Planning and Development (30 – 50 Years)

A Long-Term planning horizon is characterized as a 30 to 50-years and will entail the introduction of AWS projects into the WRWSA region. It is anticipated that groundwater sources will be depleted by this timeframe and the preceding water supply development horizons efforts with water conservation will have diminished waste within the water supply system. The Long-Term project development will build on the framework that will be instituted in the Short-Term and Mid-Term.

The AWS projects that will be considered at this point of the water supply and development process will include the Withlacoochee River and desalination at the Crystal River Power Plant. These include:

- Lake Rousseau;
- Withlacoochee River near Holder – Reservoir;
- North Sumter "Conjunctive Use" Supply;
- Withlacoochee River Aquifer Recharge near Trilby; and
- Crystal River Power Plant Desalination.

These projects have been the focus of the AWS in this report. However, by this long-term timeframe additional study will have been completed on the Ocklawaha River and desalination from the coastal east coast of Florida that all may factor into an AWS project selection process. Another nuclear power plant is being planned for Levy County, north of the existing Crystal River Power Plant. How all of these opportunities factor into the decision process for one (1) or more AWS projects will be part of the ongoing dialogue and planning processes that will continue forward.

As AWS is introduced into the WRWSA regional system, a series of interconnections to deliver water to customers becomes critical. Some of the interconnections mentioned in the Mid-Term Water Supply Planning and Development section become the backbone of the system. Additional interconnections will be planned once the AWS source or sources are identified.

This conjunctive use system will rely on various sources of water (groundwater and the possibility of surface and/or desalinated water). The ability to rely on both groundwater and AWS sources in an interconnected system will improve system reliability from both natural hydrologic conditions (drought) and manmade issues such as system failures. This type of system mimics the TBW system in the Tampa Bay region which has become a model for sustainable water supply planning, development and operation.

Chapter 12 – WRWSA Regional Water Supply Framework

12.0 Key Points

Key Points

- Water supply planning within the WRWSA is based on the knowledge that regionalization of water sources and alternative water supplies will be necessary at some point in the future.
- The challenge for the Authority is how to facilitate their introduction into the region.
- The economic slowdown has reduced the projected water demand in the region giving the WRWSA and its members an opportunity to comprehensively plan for the long-term water needs.
- A regional framework for a long-term water supply strategy that will manage the technical, economic, environmental and political issues associated with timely development of long-term, sustainable water supplies has been proposed by the WRWSA.
- The regional framework is based on a number of critical assumptions including:
    - Fresh groundwater is the preferred water source in the WRWSA;
    - Water supply development should be based on short-, mid-, and long-term planning terms;
    - Both centralized and decentralized water systems are appropriate within the WRWSA;
    - Location of these systems are critical for future interconnections and the introduction of AWS; and
    - Interconnected water systems have multiple benefits including the eventual introduction of AWS.
- The regional framework contemplates that within the short-term timeframe, water conservation, reclaimed water projects and developing groundwater will provide the needed water to meet demands.
- Mid-term projects will include the interconnections of strategic water supplies throughout the WRWSA region.
- Long-term water supply projects will be the introduction of AWS into the interconnected regional system
- The WRWSA has conceptually approved the regional framework concept and will continue working on its implementation.

12.1 Introduction

The concept of regionalizing water supply facilities in Florida continues to be encouraged at the state and regional level. A collective, regional approach to develop limited water supplies can have direct economic, environmental and water management benefits to local governments.

The State of Florida has promoted regional water supply development by creating incentives through the "Water Protection and Sustainability Program," initiated with the passage of Senate

Bills 360 and 444. The Program provides for funding for projects that are both regional and collaborative and utilize AWS as source water.

The SWFWMD also encourages a collaborative approach among municipalities in the development of water supply projects. The SWFWMD Cooperative Funding Initiative, as indicated in Board Policy 130-4, highlights a regional approach in the policy and guidelines established for the program. Consistent with Chapter 373.1961(3), F.S., the District prioritizes funding for alternative water supply projects as follows:

- Highest priority – Alternative water supply projects owned, operated and controlled, or perpetually control by a Regional Water Supply Authority (RWSA);

- Medium priority – Alternative water supply projects that are not owned, operated and controlled, or perpetually controlled by a RWSA, but meet the definition of multi-jurisdictional; and,

- Lowest priority -- Projects that do not meet the multi-jurisdictional criteria. Funding for these projects would be limited to consideration by the appropriate Basin Board(s).

12.2 Regionalization within the WRWSA

Water supply planning within the WRWSA is based on the knowledge that regionalization of water sources and alternative water supplies will be necessary at some point in the future. The question for the Authority is how the local governments in this region evolve a regional framework for a long-term water supply strategy that will support member communities and help to manage the technical, economic, environmental and political issues associated with timely development of long-term, sustainable water supplies.

The WRWSA – MWSP&IP has analyzed and developed a set of regional water demands and potential sources for the WRWSA. An overarching outcome of the planning process indicates an eventual need to develop AWS in portions of the region based on water demands and regional groundwater modeling. The availability of groundwater is limited due to existing withdrawals, competition for remaining groundwater and the constraints on the system due to the establishment of MFL's.

Since the completion of the WRWSA – RWSPU projected water demand for the region has decreased dramatically (Figure 12-1 – WRWSA Public Water Supply Demand Projections Comparison). The economic downturn has altered the timing for projects and anticipated related population projections have declined. This slowing of growth provides a window to extend use of existing and future supplies of groundwater through aggressive conservation and selective groundwater supply development.

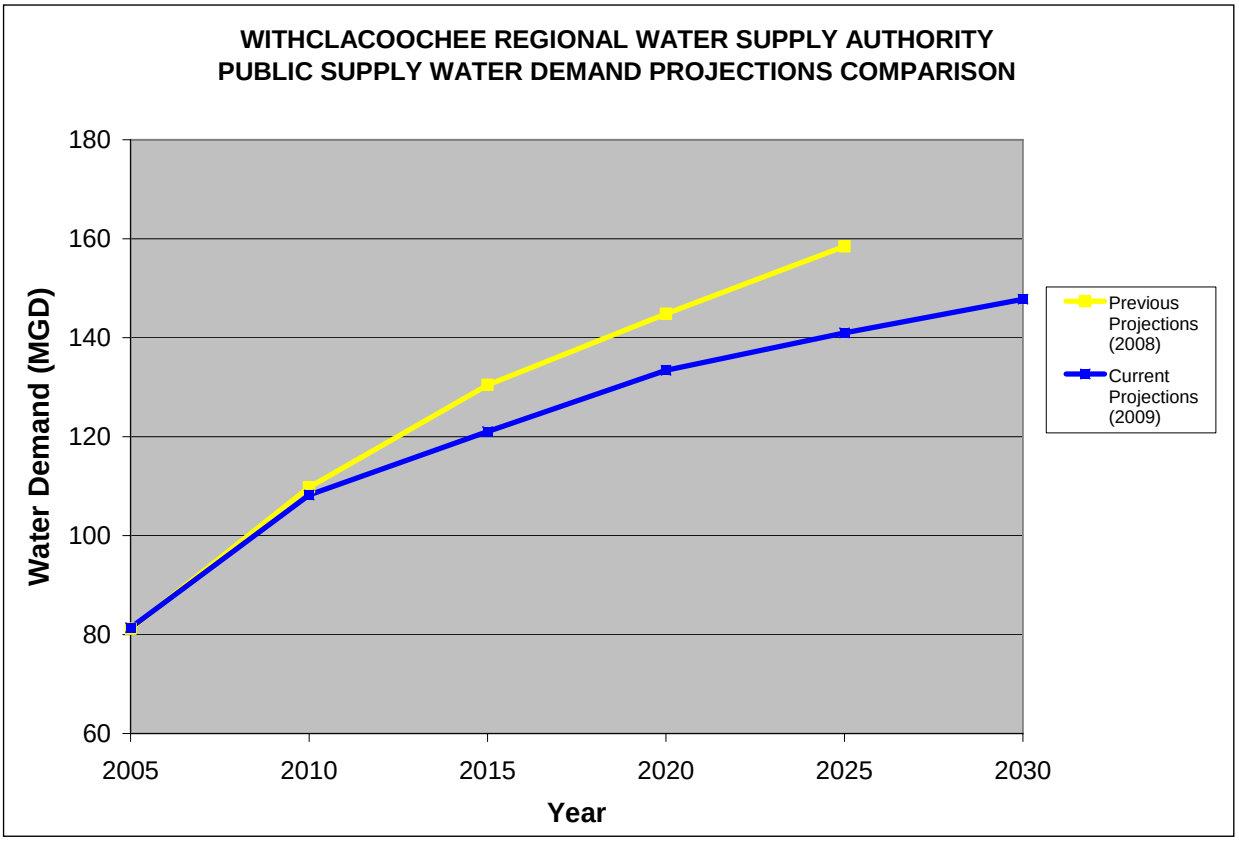


Figure 12-1. WRWSA Public Water Supply Demand Projections Comparison.

As short-term demands are met by the development of new groundwater sources it is important to ensure that these projects are designed contemplating the eventual introduction of AWS sources into a regional system. Critical to the long-term regional strategy is:

- Locating these projects with respect to existing and future demand centers;
- Designing projects with the objective of eventual interconnection of water supply systems;
- Maintaining adequate rights-of-way for interconnecting systems and the eventual introduction of AWS;
- Obtaining the necessary agreements from WRWSA members to codify the regional approach;
- Reviewing and amending (if necessary) the WRWSA governance and institutional makeup to incorporate the Framework approach;
- Interconnecting water supply systems over time; and
- Introducing alternative water supplies into the regional system when needed.

12.3 WRWSA Regional Framework

A strategy for a Framework has been formulated and discussed with both the WRWSA Technical Advisory Committee and the Board. The Framework is a measured approach to position the WRWSA to become a more active player in water supply planning and development in the region. The Framework was developed as the results of the WRWSA – MWSP&IP related to water supply demand and water supply sources were determined and better understood.

The Framework will allow local governments to interact and integrate water supply planning and development in a regional context. It provides a specific plan for future water supply development that local governments and the Authority can plan around. The Framework will be a transparent plan for future water supply development. This planning and development approach will result in greater acceptance by the State and water management districts when it comes to water/consumptive use permitting and potential funding for water supply projects. Regional water supply projects, AWS development and coordination with the water supply planning efforts of the water supply authorities will all assist local governments in meeting these objectives.

The WRWSA – Detailed Water Supply Feasibility Analyses has identified the groundwater supply facilities that can provide the network for an interconnected and integrated water supply system. This analysis has determined that groundwater developed in a conscious manner with regard to MFLs and other regulatory constraints is available for development within the region. This groundwater can be developed either for regional users or individual governments within the WRWSA.

The Framework would allow the WRWSA to become the “clearinghouse” for the regionalization of the water supply system. The WRWSA – Detailed Water Supply Feasibility Analyses and the SWFWMD Water Supply Plan would be the guidance documents for local government to utilize as new water supplies were planned, permitted and developed. The role as a clearinghouse would be to ensure that new water supply projects fit into a regional context that contemplated future interconnections and the introduction of AWS. The benefits for the local governments who planned with the WRWSA within the Framework concept would be the potential for funding and assistance within the regulatory constraints of water use permitting.

12.3.1 Assumptions for WRWSA Regional Framework

The concept of regionalization of water supplies is predicated on a number of important assumptions that were discussed at the meetings. These include:

- Fresh groundwater is the preferred water source in the WRWSA. Optimizing the locations of large public supply groundwater withdrawals will extend the life of groundwater in the region as the resource continues to be developed;
- Water supply development projects should be planned along short, medium and long-term time lines (short = 1 to 20 years; medium – 15 to 35 years; long-term 30 – 50 years). The specific time line for projects must be flexible enough to adapt to changing needs and conditions in the region;

- For the short-term (1 to 20 years), there will be groundwater in many areas of the WRWSA available to meet local government water demands. Local groundwater can and should be developed effectively by local governments. In some specific circumstances, it may make sense for groundwater to be developed regionally. The north Sumter County wellfield may be an example of regionally developed groundwater;
- Both "centralized" and "de-centralized" planned water supply systems may be appropriate within the WRWSA. Centralized systems can effectively serve higher population densities with wells that are interconnected and generally serve more than one user. De-centralized systems can effectively serve lower population densities with independent wells that are designed to serve only one entity, but are planned to be interconnected in the future;
- The general location and design of "centralized" and "de-centralized" systems must be planned for today to ensure that planned future expansion and interconnection between systems can occur when needed in the future. General location and design components include wells, treatment and pumping facilities, easement locations, and transmission and distribution piping. The time for planning location and design components for these future systems is now but must be flexible enough to adapt to changing needs and conditions in the region;
- Effective regionally interconnected water supply systems can increase available water supplies, act as emergency interconnections between utility systems, introduce a diversity of water sources, be more sustainable from an environmental and water resource perspective and can be a better economical solution for water supply development than traditional de-centralized systems; and
- The benefits of cooperative planning for water supply systems to expand and interconnect over time include assurances that future needs will be met, that reliable emergency backup will be available, and that alternative water supplies can be developed in an incremental manner. The planned use of groundwater, reuse, and conservation in transitioning to alternative water supplies over time is fundamental to achieving these benefits.

12.3.2 Evolution of a Regional Framework for the WRWSA

The WRWSA Framework can evolve in a number of ways. The following is a conceptual approach to portray the Framework and how it would evolve over the short, mid and long-term time periods.

12.3.2.1 Short-Term Water Supply Development

Conservation programs would be implemented by local governments with support and cooperation of the WRWSA. These conservation initiatives would position municipalities to meet their compliance per capita rates required by the SWFWMD by 2018 of 150 gpcpd. As demand forecasts project the need for additional water, potential groundwater sources would be considered based on local availability and areas identified a potential groundwater development areas within the WRWSA – Detailed Water Supply Feasibility report (Figure 12-2). These source areas would be coupled with identified existing and projected water demand areas.

Member governments and the WRWSA would work together to determine how proposed groundwater projects would fit within the Framework. Strategically locating these projects will lay the groundwork for system interconnections and the eventual introduction of AWS into a regional system.

The WRWSA would also facilitate the potential for collaborative development of groundwater between members. These efforts would focus on the technical, environmental and economic benefits of jointly developing groundwater supplies.

12.3.2.2 Mid-Term Regional Interconnects

To maximize and safeguard the benefits of existing water supplies, the Framework considers interconnections of member's water supply systems as a logical mid-term water supply planning goal (Figure 12-3). Access to groundwater supplies will continue to diminish in the future and utilizing existing supplies more efficiently and effectively will allow local governments to rely on traditional water sources longer within the planning horizon.

Interconnections not only enhance water supplies but provide for emergency backup for system reliance. This can include mechanical issues with infrastructure, water quality issues and other potential threats to water supply.

12.3.2.3 Long-Term Introduction of AWS

The ultimate objective of the Framework is to provide the basis for the introduction of AWS to meet future long-term water demands. By the time AWS is required for future water supply the Framework provides for the necessary infrastructure, including water treatment, storage and transmission, which will allow AWS to be seamlessly introduced into the region (Figure 12-4).

AWS sources could be a combination of, or individual projects including; Lake Rousseau, Withlacoochee River, Ocklawaha River and Crystal River Desalination. By effectively planning and contemplating the necessary infrastructure and rights-of-way, the introduction of AWS will be less expensive and disruptive when required.

12.3.2.4. Incentives for Regionalization

We are recommending a cooperative approach between member governments to fit within this long-range water supply strategy. If agreed upon, the WRWSA can work with the SWFWMD and SJRWMD to develop appropriate incentives for participants. These could be regulatory incentives such as longer term Water Use Permits or financial incentives that may be available as conservation measures are incorporated and/or as alternative water supplies are developed.

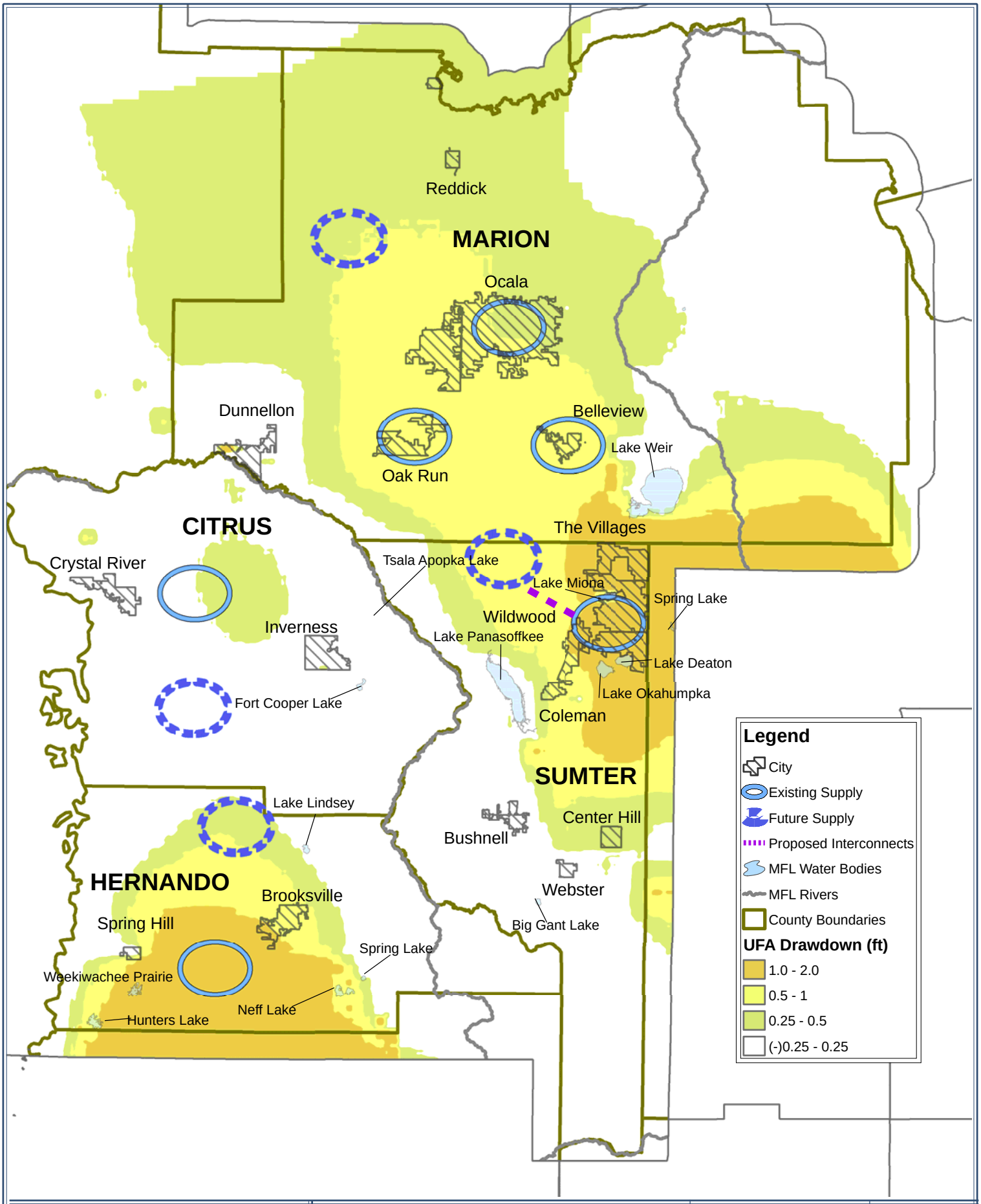
The development of appropriate incentives for the WRWSA region may involve SJRWMD and SWFWMD rule-making. Changes to water management district water supply rules are generally formulated over time and involve a great deal of agency consideration. Reasonably concrete projects will be needed to assure sufficient data is available for water management district consideration in rule-making, with the understanding that the details of the projects will continue to evolve as conditions change in the region.

12.3.2.5 Next Steps for Development of the WRWSA Framework

There appears to be a general consensus from both the WRWSA TRC and Board regarding the need and viability of the Framework. Several issues that need to be further analyzed and discussed include:

- WRWSA Governance: Do the current interlocal agreements that form the WRWSA contemplate and allow for the Framework to be instituted? What, if any amendments or modifications are necessary?
- Interlocal Agreements: If a cooperative approach between member governments to implement the Framework is agreed upon, what form should the cooperative agreement(s) take?
- WRWSA Clearinghouse Role: Should the Authority act as a clearinghouse for projects? In order for the Water Management Districts to consider incentives for the development of regional water supplies, should the WRWSA act as the clearinghouse for local governments to ensure that projects adhere to the long-range water supply strategy?
- Short-term Projects: For the prioritized options, how should they best be configured? For example, where are the best location(s) for tie-ins? Where are new wells going to be developed locally? Can a better transmission alignment be developed? What rights-of-way are available and where do rights have to be acquired?

Further review and discussion with the WRWSA TRC and Board is necessary to address and determine how to move forward with the implementation of the Framework to ensure sustainable water supplies for the future.



Water Resource Associates, Inc.
Engineering ~ Planning ~ Environmental Science
4260 W. Linebaugh Ave.
Phone: 813-265-3130
Fax: 813-265-6610
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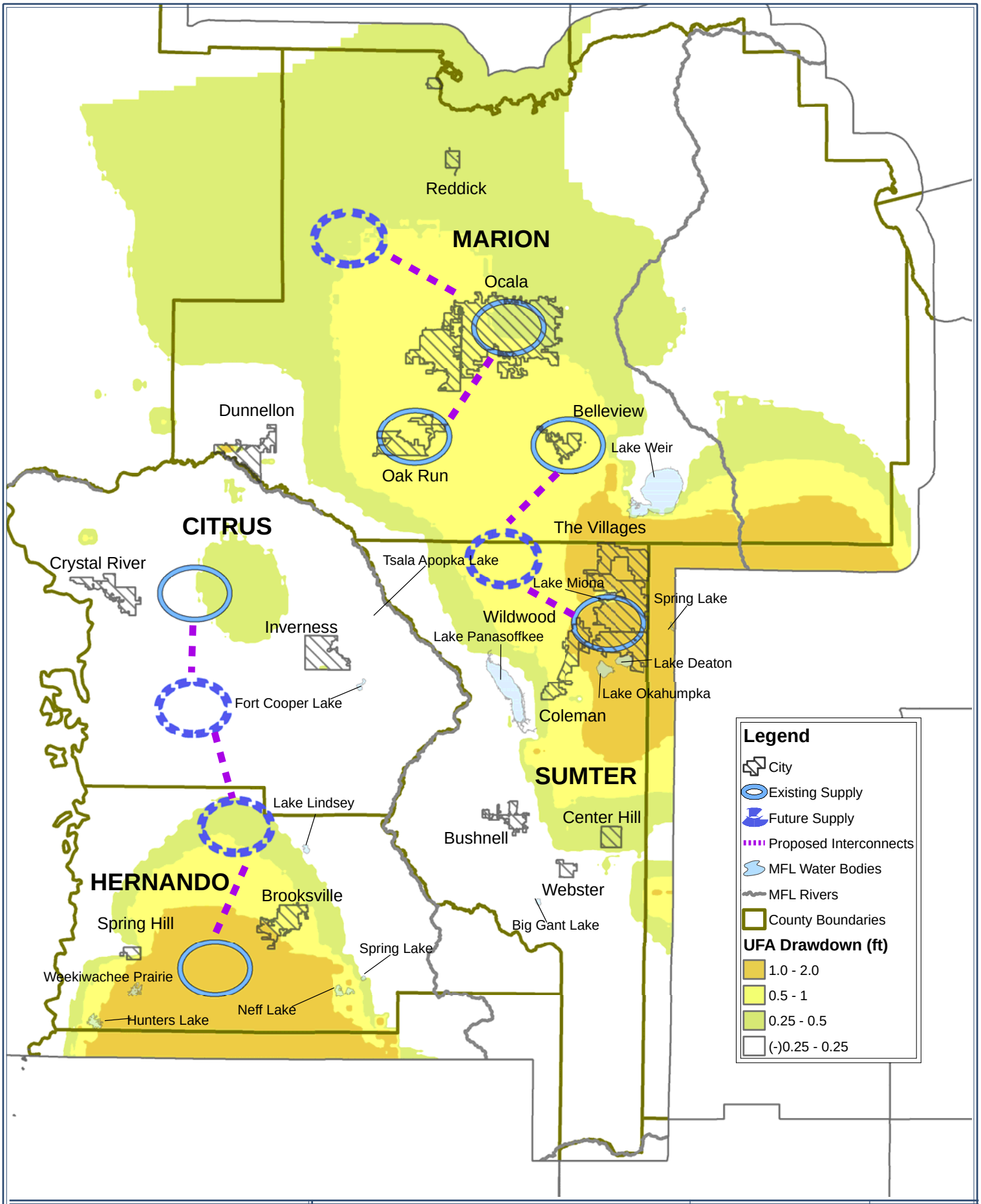
Figure 12-2
Regional Framework
Short-Term Groundwater Devleopment

ORIGINAL DATE: 12-23-2009
REVISION DATE: NA
JOB NUMBER: 0468
FILE NAME: Fig 12-2 Regional...mdx
GIS OPERATOR: LEF

N W E S
1 Inch = 7.1 Miles



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Phone: 813-265-3130
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Figure 12-3
Regional Framework
Mid-Term Regional Interconnects

ORIGINAL DATE: 12-23-2009
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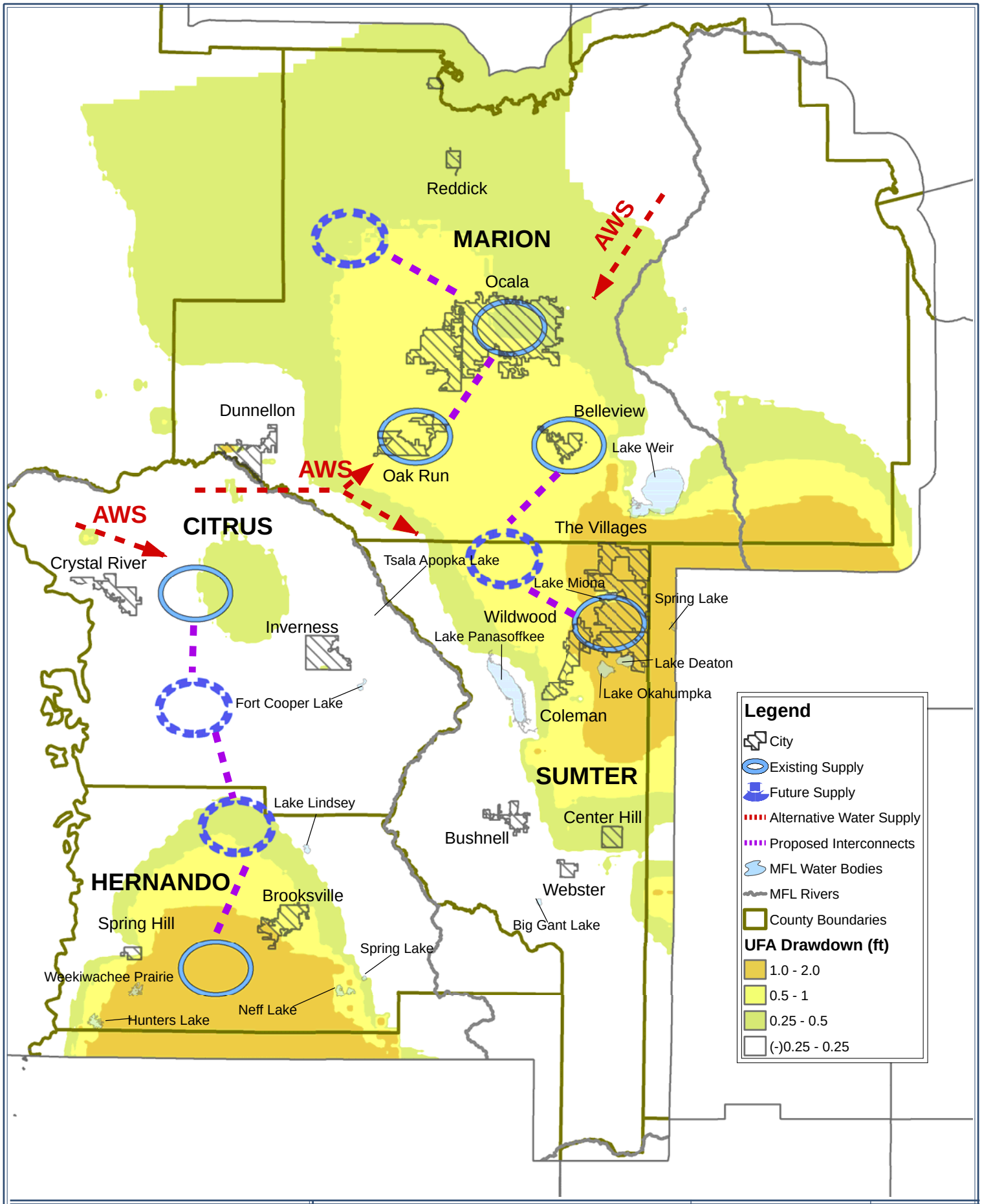
JOB NUMBER: 0468
FILE NAME: Fig 12-3 Regional...mdx
GIS OPERATOR: LEF

N W E S
1 Inch = 7.1 Miles



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4260 W. Linebaugh Ave.
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Figure 12-4
Regional Framework
Long-Term Introduction of AWS

ORIGINAL DATE: 12-23-2009
REVISION DATE: NA
JOB NUMBER: 0468
FILE NAME: Fig 12-4 Regional...mdx
GIS OPERATOR: LEF

N W E S

1 Inch = 7.1 Miles

Chapter 13 – Recommendations

13.0 Introduction

This recommendations chapter of this WRWSA – Detailed Water Supply Feasibility Analyses is an attempt to develop and raise a series of recommendations, observations and options for consideration by the WRWSA and member governments. The following are not prioritized or set in any sequential order but are important to consider by the WRWSA in these relatively uncertain times with respect to sustainable water supply for its members. The recommendations can set the stage for considerable discussion and deliberation with the WRWSA Board as they consider the existing and future role of the Authority and the potential impact for its members and the region.

13.1 Population and Water Demand

13.1.1 Population and Projected Water Demand Updates

Updates of the population and water demand within the WRWSA are important to keep water supply planning as viable and current as possible. These updates should take place on a regular basis, every five-years, concurrently with the SWFWMD update of their RWSP. However, if the population projection updates from BEBR demonstrate a dramatic departure from the previous projections an update should be considered at that point. When interpreting SWFWMD demand projections, utilities should consider the effect of the compliance per capita rules.

13.1.2 Tracking of Water Use Types and Quantities

The WRWSA should track closely water uses other than public supply. Although public supply is and will continue to be the largest of the water use increases (70%), all other water uses are also projected to increase. Trends in agricultural, industrial/commercial and recreational water use can change, either increasing or decreasing at an unanticipated rate and potentially impacting the WRWSA public supply water use planning.

13.1.3 Large Water Use Tracking

Potential large water users of all water use types should be tracked by the WRWSA. WUP and CUP applications to the SWFWMD and the SJRWMD for demands over a certain water quantity threshold should be requested from the water management districts to determine if the proposed water use will affect the WRWSA planning efforts.

13.1.4 Domestic Self-Supply Water Consumption

Domestic self supply (DSS) water use within the WRWSA is projected to increase from an estimated 17.63 mgd in 2005 to 30.22 mgd in 2030, a 71% increase. This increase could be further exacerbated by stringent compliance per capita rate requirements instituted by the SWFWMD and contemplated by the SJRWMD. The use of domestic wells within the service areas of public supply utilities could have a positive impact on per capita rates but a net negative impact to the water resources of the area.

The impact of DSS to the water resource is not fully understood but is being analyzed by both water management districts. The WRWSA should participate in these discussions and support efforts to quantify and determine the potential impact of DSS on the availability of water resources and the potential impacts to the water resource.

13.2 Hydrogeologic Data Collection and Resource Monitoring

13.2.1 Monitor Lower Floridan Aquifer (LFA) and Surficial Aquifer Data Collection Activities

Hydrogeologic data collection and resource monitoring remains an important initiative within the WRWSA to better understand the groundwater resources of the region. Groundwater modeling and other interpretative analyses are hampered by the lack of comprehensive data on the aquifer systems. This is particularly evident in northeast Sumter and southeast Marion Counties where the hydrogeology is complex and aquifer characteristics are highly variable.

This is also an area where traditional groundwater supplies are limited due to potential impacts to MFLs that have been established on several lakes in the area and other surficial features. The LFA in this area is a potential water supply source for both potable and non-potable uses. However, the LFA is not well studied in the area and its aquifer characteristics and water quality appear to be highly variable. The WRWSA role in assisting the SWRWMD and SJRWMD in data collection is important to verify whether the LFA is a viable water source for future development.

13.2.2 Develop and Coordinate Resource Monitoring Program between SWFWMD and SJRWMD in Northern Sumter and Southern Marion County

As mentioned, the area in northern Sumter and southern Marion Counties has a high degree of uncertainty and a limited understanding of the aquifer system. This in part is due to the limited availability of hydrogeologic information that has been generated. This is also an area where SWFWMD and SJRWMD have differing opinions on the amount of groundwater that is available for development; which is in part due to the use of different planning criteria for potential impacts to wetlands.

The WRWSA should continue to be engaged in this issue and facilitate a coordinated monitoring program between the districts. An emphasis of WRWSA engagement should be at the regulatory level to ensure that resource evaluation during permitting is consistent for members in the region. As groundwater supplies diminish, the WRWSA should facilitate the development of a common set of resource evaluation methods, educate members on appropriate supply strategies and advocate on their behalf with the WMDs. This will ensure that adequate attention and resources are directed at this rapidly growing area with significant water demands.

13.2.3 Funding for Hydrogeologic Studies

The WRWSA should work closely with the SWFWMD, SJRWMD, and USGS to determine, prioritize and fund needed hydrogeologic work within the region. This hydrogeologic information provides the basis for water supply availability and is critical to meaningful and cost-effective water supply planning and regulation within the WRWSA. Continued support for operation and

maintenance of streamflow and well monitoring stations is essential to future water supply development and resource protection activities.

13.3 Regional Groundwater Assessment

13.3.1 Groundwater Models

The ND Model (utilized by the SWFWMD) requires a complete peer-reviewed calibration and the NCF Model (utilized by the SJRWMD) requires updating and subsequent peer review. The conceptual representation of the surficial aquifer in Marion and Sumter Counties must be similar in both models. Recharge, which has been addressed differently in the ND and NCF Models, must be applied in a consistent manner so that comparable results are generated. The WMDs and member communities are increasing their investments in hydrogeologic data collection in the region. This new field data will provide insight to the function of the aquifer system, so the knowledge should be coordinated with member communities through the WRWSA and the WMDs. As additional information is gained, the ND Model has transient capabilities and fully three-dimensional representation of the aquifer formations for incorporate of the additional data.

13.3.2 Groundwater Model Boundary Conditions

As groundwater supplies reach their sustainable limits in many areas of Florida, regional aquifer level declines could affect water supply management strategies in the WRWSA region. To assess this affect, boundary conditions of the WMD models have been adjusted in planning evaluations to reflect projected aquifer level declines from outside the region. However, these boundary adjustments currently reflect regional aquifer declines that the SJRWMD has determined to be unacceptable and thus further groundwater development will not be allowed by their regulatory program. We believe that this approach may be overly conservative. As regional withdrawals increase over time, this practice has the potential to distort estimates of groundwater availability in the models used in the WRWSA.

Further coordination on groundwater modeling and associated boundary conditions must continue between the SWFWMD, SJRWMD and the WRWSA to ensure consistent management and water supply development strategies within the WRWSA.

13.3.3 Resource Assessment

13.3.3.1 MFLs

MFLs need to be adopted in a timely manner for the WRWSA region. A number of springs, rivers and lakes are scheduled for completion by SWFWMD and SJRWMD within the next five (5) years. These MFLs will protect area water resources and the environment from significant harm due to water withdrawals and determine limits on additional groundwater and potential surface water withdrawals.

As detailed in this report, for waterbodies and watercourses where MFLs have yet to be adopted, proxy thresholds were established as a resource constraint on water development for this interim period. As MFLs are established and adopted the WRWSA must review, comment and track their progress. If the adopted MFLs differ significantly from the proxy thresholds established for the report, analysis should occur to determine if this difference will have

significant impact on recommendations or prioritization from the report. As with past initiatives, proposed MFLs within and surrounding the WRWSA should continue to be analyzed.

13.3.3.2 Surficial Aquifer System and Surficial Resources

A better understanding of the relationship between surficial water resources and the aquifer system within the region is needed. The impact of cumulative aquifer level decline on wetlands and lakes located in the region's sandhill areas is poorly understood. In the SJRWMD area of jurisdiction within Marion County, a restrictive 0.35-foot WMD threshold for aquifer decline has been applied to wetlands perched 20-feet above the water table which are unlikely to be affected by groundwater withdrawals. Additional monitoring, analysis, and field data collection will improve the understanding of surficial water resources.

13.4 Water Conservation

13.4.1 WRWSA Role in Regional Water Conservation

The WRWSA has had a comprehensive program for supporting water conservation within the region for over 10-years. This program has provided grant monies to fund conservation initiatives based on proposals submitted by WRWSA members. This has developed into the WRWSA Regional Water Conservation Program which disseminates water conservation information, funds water conservation programs and initiatives and co-funds water conservation coordinators for county governments. The importance of this program and the WRWSA role in water conservation cannot be overemphasized with diminishing water supplies and compliance per capita requirements from the SWFWMD.

Water conservation information from the “SWFWMD Non-Agricultural Water Conservation Modeling” should be utilized by the WRWSA and its members to develop cost effective conservation programs that directly target high per capita usage. This District model analyzes local government demographics and optimizes conservation devices that have the highest potential of success for a given community. The WRWSA should develop a comprehensive plan that targets and prioritizes water conservation programs that will be effective in reducing water demands for member governments. This “WRWSA - Water Conservation Initiative (Conservation Initiative)” should target members with high compliance per capita rates and assist in tailoring water conservation strategies and initiatives that will reduce water usage utilizing the SWFWMD model.

The Conservation Initiative should develop a five (5) year water conservation program that prioritizes and develops budgets for member government conservation initiatives. The Conservation Initiative will better direct WRWSA funding through its cooperative conservation funding program. It will also demonstrate to the SWFWMD a regional and comprehensive approach to water conservation that will prioritize cost-effective initiatives for funding through their Cooperative Funding Initiative.

13.4.2 SWFWMD Compliance Per Capita

Water demand projections for the 2030 planning horizon will vary dramatically utilizing planning numbers based on historical per capita rates versus projections based on the compliance per capita rate instituted by SWFWMD and contemplated by the SJRWMD. Within SWFWMD

alone, approximately 21 MGD of water will be saved by 2030 when analyzing unadjusted per capita rates. Compliance per capita rates are not only important to WRWSA member governments because of the regulatory consequences but also the ability to delay costly water supply development projects.

The WRWSA should work with its members and the District to develop strategies for implementing aggressive water conservation programs. Compliance per capita rates must be met by each individual utility by 2018. Fifty percent of the required per capita rate must be reached by 2014. Demand reduction initiatives can take considerable time to be funded, implemented and results realized. Member governments must act aggressively in order to ensure that they remain within SWFWMD regulatory compliance.

13.4.3 "SWFWMD Non-Agricultural Water Conservation Modeling" (SWFWMD Model)

As mentioned, based on the implementation of the compliance per capita requirements by the SWFWMD, the WRWSA should take an active role in assisting member governments in meeting the new standard. The WRWSA should facilitate workshops and individual meetings with the SWFWMD and WRWSA members to assist in the utilization of the SWFWMD Model. The SWFWMD Model based on individual member government demographics will target the most effective conservation devices for implementation.

The results of these workshops and meetings will be a series of prioritized, cost-effective water conservation programs and initiatives. This information will be incorporated into the "WRWSA - Water Conservation Initiative" that will be used for project ranking and funding.

13.5 Reclaimed Water

13.5.1 WRWSA Role in Regional Reclaimed Water Supply Planning

The water supply role of reclaimed water will continue to increase and expand over time in the WRWSA region. Working with member governments, the WRWSA should take a proactive role in the analyses and promotion of reclaimed water projects for its members. The goal is to articulate the need for reclaimed water to supplant the development of new water sources, prevent resource impacts and offset high compliance per capita rates. Strategies for a WRWSA role in reclaimed water planning should be developed as described below.

13.5.2 Subregional Planning – WRWSA Reclaimed Water Implementation Plan (Reclaimed Plan)

Subregional Reclaimed Plans should be developed which articulate the need for specific projects and obstacles and opportunities for their implementation. The Reclaimed Plans would identify projects that are cost-effective and will have the greatest impact in their subregion.. The WRWSA Reclaimed Plans would be developed in cooperation with member governments and utilize information provided by member governments, the WRWSA, and the SWFWMD and SJRWMD. The Plans would develop both priority projects and multi-year budgets for a 10-year period. The Reclaimed Plans would be updated periodically and would be submitted together with member governments Cooperative Funding Initiative applications to lend support that those reclaimed projects fit into a regional reclaimed water strategy.

13.5.3 WRWSA Reclaimed Water Workgroup

Though some regions of Florida have experienced great success with reclaimed water supplies, other regions have not been so fortunate. A statewide workgroup is developing policy recommendations to facilitate the addition of reclaimed water customers to utility systems. A WRWSA reclaimed workgroup could be a liaison to state policy efforts and develop strategies specific to the WRWSA region to enhance beneficial use of this resource. The workgroup would be composed of member governments and representatives from FDEP, SWFWMD and the SJRWMD, and would meet periodically to discuss reclaimed water issues in the WRWSA.

13.5.4 Cost-Share Funding for Beneficial Reuse Projects

Utilizing the Reclaimed Plan, the WRWSA should work with SWFWMD and SJRWMD to ensure cooperative funding for beneficial reclaimed water projects in the region. A long-term plan that is tied and prioritized to offsetting water demands, preventing resource impacts, and lowering per capita rates should gain support because it will ensure that District monies will be geared towards the most cost-effective and meaningful projects.

13.6 Water Supply Project Options

13.6.1 Potable Traditional Water Supply Development

Within the WRWSA – Detailed Water Supply Feasibility Analyses the following projects have been the focus of the analyses of the WRWSA region: **Fresh Groundwater:** Sumter Wellfield; Citrus Wellfield; Northwestern Marion Wellfield; and the Northeastern Marion Wellfield. Each of these projects reflects the cost-competitiveness of utilizing dispersed groundwater versus potable alternative water supplies.

The Sumter and Northwestern Marion Wellfields are recommended for possible implementation in the Short-Term (0-20 years). The Citrus and Northeastern Marion Wellfields are recommended for possible implementation in the Mid-Term or Long-Term (15-35 or 30-50 years).

13.6.2 Potable Alternative Water Supply Planning

Within the WRWSA – Detailed Water Supply Feasibility Analyses the following projects have been the focus of the long range AWS analyses of the WRWSA region: **Surface Water:** Lake Rousseau; Withlacoochee River near Holder – Reservoir; and the North Sumter “Conjunctive Use” Supply. **Aquifer Recharge:** the Withlacoochee River Aquifer Recharge near Trilby, and **Seawater:** Crystal River Power Plant Seawater Desalination. Each of these projects reflects the higher costs of utilizing potable alternative water supplies versus traditional groundwater supplies. Flexible strategies are needed to ensure that suitable supplies are available when groundwater is depleted and AWS is required to meet future water demands in the WRWSA region.

None of the potable AWS projects are recommended for possible implementation in the Short-Term (0-20 years), and further updates will be needed to refine these complex and challenging projects as growth occurs over time. The **Surface Water:** Lake Rousseau and North Sumter “Conjunctive Use” Supply projects are recommended for possible implementation in the Mid-

Term or Long-Term (15-35 or 30-50 years). The **Seawater:** Crystal River Power Plant Seawater Desalination is recommended for possible implementation in the Mid-Term or Long-Term (15-35 or 30-50 years). The **Surface Water:** Withlacoochee River near Holder – Reservoir project is not recommended for possible implementation due to the high cost of the reservoir. The **Aquifer Recharge:** the Withlacoochee River Aquifer Recharge near Trilby project is not recommended for WRWSA implementation, but may be pursued by other entities.

Additional study is underway by the SJRWMD on the Lower Ocklawaha River and desalination from the east coast of Florida (Coquina Coast Desalination Plant). These two projects are being considered for utilities on the east- coast of Florida and certain inland locations. These projects could potentially provide alternative water supply to WRWSA members, but are not evaluated by the WRWSA.

These additional AWS opportunities being investigated outside of the WRWSA could factor into the decision process for one (1) or more AWS projects for future development. The WRWSA must be a part of the ongoing dialogue and planning processes that are continuing forward. The WRWSA should keep abreast of work that is being done by the SJRWMD on the Ocklawaha River and Coquina Coast Desalination as well as alternative water supply efforts in Lake County. The studies focusing on the viability of these sources as water supplies could factor into the AWS planning for the WRWSA, along with actual patterns of growth and further technical studies in the WRWSA.

13.6.3 Pipeline Corridors

One of the long term challenges facing the WRWSA region is the long distance between the potable alternative water supply sources and the population centers. Transmission may account for over 50% of the cost for these supplies. Corridors for alternative water supply delivery should be acquired well in advance of this need, so that transmission can be constructed while avoiding interferences and cost overruns. Planning efforts should seek to reduce these transmission distances before the potable alternative water supply projects are needed.

The most significant long range corridor need is from the alternative water supply sources in Citrus County south to Hernando County. A feasibility study should be performed to identify and subsequently acquire lands for the pipeline corridor. The study should review public ROWs and easements, subsurface utilities, and roadway expansion plans. The same corridor could be used to interconnect Citrus County's northern and southern service areas, which will be a significant need in the mid-term. The study should be coordinated closely among Citrus County, Hernando County, and the WRWSA.

13.6.4 Land Acquisition

Utilization of public lands was a criterion used in this report for the conceptual design of the water supply project alternatives. Final project locations may or may not utilize public lands. And land acquisition activity conducted by the WRWSA would involve a study process which includes opportunities for public comment. Additional constraints pertaining to either public or private lands would be identified and evaluated during that process. The WRWSA should coordinate potential land acquisition opportunities for groundwater and AWS projects identified

in this report with the District's land acquisition programs, as tracts of land are evaluated, scored and prioritized for potential purchase.

13.6.5 Lake Rousseau

Current water treatment technology, available resource assessment tools and projected demands suggest that Lake Rousseau will be the most cost-effective WRWSA potable alternative water supply project. This understanding may evolve in the future as additional study occurs; currently, the most significant presumption is that sufficient yield will be available in the absence of an adopted MFL. The Lower Withlacoochee River MFL is scheduled for adoption by the SWFWMD in 2011. The adoption of this MFL will enable the WRWSA to initiate a substantive dialogue on whether seawater desalination or surface water development should be prioritized.

13.6.6 Seawater Desalination at Crystal River

The cooling flows at the Crystal River Power Plant offer significant advantages to a seawater desalination facility. The synergy of the combined operation is that the cooling flows can dilute the discharge of saline concentrate from the RO process which would otherwise be very costly to dispose of. Likewise, the Cross Florida Barge Canal offers water quality that is considerably less saline than seawater for inflow to the RO plant. However, large freshwater discharges from Lake Rousseau (both from operational and non-operational inflows) into the canal will provide unprecedented operational challenges to developing this source. These inflows of freshwater provide significant swings in water quality that will have to be considered in the design of the facility.

Land to locate the desalination facility is also in short supply in the area of the Crystal River Power Plant. An ongoing dialogue and coordination with Progress Energy, the SWFWMD and the WRWSA should occur to ensure that the potential for desalination will not be overlooked as future plans for energy production in the area mature.

13.7 Water Supply Partnership Opportunities

13.7.1 Incentives for Regional Water Supply Development

The WRWSA should work with the SWFWMD and the SJRWMD to create incentives for the regional development of both traditional groundwater supplies and AWS. Although incentives are in place for the regional development of AWS on a statewide basis, incentives for a regional approach to remaining groundwater development should be pursued. Regional systems are a new concept within the WRWSA and will be required to ensure that groundwater development is maximized and is completed in an environmentally and economically sound manner.

Incentives can be monetary including the expansion of the cooperative funding initiatives or land acquisition. Regulatory incentives could include longer duration withdrawal permits (20 year), consolidated permitting or other incentives that would enhance a regional approach for the development of water supplies in the region.

13.7.2 AWS Permit Conditions and Resource Evaluation

The SJRWMD has expressed concern over regional aquifer declines and groundwater availability in the WRWSA region. While the SWFWMD and SJRWMD have been issuing groundwater permits in Marion County, many utilities have alternative water supply planning conditions in those permits. The WRWSA should ensure the SWFWMD and the SJRWMD have established a common understanding of resource conditions in order for member utilities to meet these conditions in an environmentally and economically sound manner.

13.7.3 10-Year Water Supply Facility Workplans

State rules now require local governments to address the availability of water supplies and public facilities serving areas of projected growth in a local government comprehensive plan. Florida statutes authorize the Districts' and other governmental agencies to provide substantive input during the local government comprehensive planning process. Where regional or multijurisdictional water issues are involved with the local government comprehensive plan, the WRWSA should work with member governments to provide supporting information for their 10-year facility workplans.

13.8 WRWSA Water Supply Regional Framework

13.8.1 Workshop

The Framework has been presented to the WRWSA Board and several member governments as it has evolved. However, there has never been an interactive, comprehensive presentation in a workshop session. The Framework has implications for not only the WRWSA but for each member government. It is recommended that another session or series of workshops is scheduled for WRWSA members and member governments. It is also recommended that this be held outside of the monthly Board meeting, to give the review and discussion of the Framework the focus and attention that it deserves.

This session should be run by an outside facilitator. This would give both WRWSA administrative staff, Board members and technical support the opportunity to more readily participate in the workshop/visioning session.

13.8.2 Governance

Based on the outcome of the workshop session on the Framework, a comprehensive review of the WRWSA governance documents should be completed. The current governance documents should be amended to reflect the recommendations and initiatives approved by the WRWSA Board from the workshop session if warranted.

13.8.3 Funding

As part of the review of the WRWSA governance documents a review of the funding mechanisms to support the administrative, technical and operations functions of the agency should also be considered. The current funding criteria were set under an old model and readdressing the funding formula would complement the other reviews that the WRWSA may be contemplating. This would include but not be limited to the per capita rate per member and

readdressing the agreements and funding mechanism with Citrus County on the CAB 1 & 2 Wellfields.

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APPENDIX LEVY

Contents

References

Unless otherwise noted, the data in the section was extracted from:

Progress Energy, 2008. Application to Florida Department of Environmental Protection (FDEP), Levy Nuclear Plants Units 1 and 2 Combined License Application. Part 3 - Environmental Report: Section 4.4.2 (Social and Economic Impacts), p.59-74.

Table 1. Illustration of Levy Nuclear Plant (LNP) Estimated Workforce Methodology

Year	Phase	Estimated Workforce	Incoming Workforce[1]	RIMS Job Multiplier[2]	Total Jobs Created	Indirect Jobs[3]
2010	Construction	300	150	1.7	255	105
2011	Construction	500	250	1.7	425	175
2012	Construction	1600	800	1.7	1360	560
2013	Construction	2600	1300	1.7	2210	910
2014	Construction	2700	1350	1.7	2295	945
2015	Construction	2200	1100	1.7	1870	770
2016	Construction	800	400	1.7	680	280
2017	Construction	200	100	1.7	170	70
2018[4] and Beyond	Operation	800	400	1.7	680	280

(1) It is assumed that 50% of these employees will be migrant workers from outside the region (Progress Energy, 2008 p.61).

(2) RIMS (Regional Input-Output Modeling Systems) multiplier for the 8 county region is 1.7. The RIMS Multiplier estimates the indirect jobs created by the LNP (Progress Energy, 2008 p.62).

(3) It is assumed that indirect jobs will be filled by people already residing in the (50 mi.) region (Progress Energy, 2008, p.62).

(4) A minimum of 800 employees will be needed once the plant is operational.

= Peak Construction Jobs
= Permanent Job Creation

Table 2. Illustration of Projected WRWSA Population Methodology for Levy Nuclear Plant (LNP)

County	Percentage of Incoming LNP Workforce[1]	Workforce Incoming at Peak Construction[2]	Workforce During Operation[3]	People Per Household[4]	Total Population Increase at Peak Construction	Total Population Increase During Operation
Citrus	17%	230	68	2.49	571	169
Sumter	2%	27	8	2.49	67	20
Marion	35%	473	140	2.49	1,177	349
Hernando	2%	27	8	2.49	67	20

(1) Levy County Nuclear Power Plant Application Reference (Progress Energy, 2008, p.63).

(2) Number of workers living in each individual county, based on the report's assumed percentage of incoming workforce, and assumed distribution.

(3) A minimum of 800 workers are needed for operation of LNP. It is assumed that 50% of these workers are migrant. The assumed percentage of Distribution for each county is carried throughout the calculation. Indirect jobs will be filled by people already residing in the region (Progress Energy, 2008 p.61-62).

(4) Florida's average person per household is 2.49 (U.S. Census Bureau, 2008).

Table 3. Projected Population Increase Over Time for Levy Nuclear Plant (LNP)

County	Percentage of Workforce[1]	Direct Incoming Workforce During Construction								Permanent Workforce During Operation[2]	People Per Household[3]	Total Increase of Population								Permanent Incoming Population
		2010	2011	2012	2013	2014	2015	2016	2017	2018		2010	2011	2012	2013	2014	2015	2016	2017	2018
Citrus	17%	26	43	136	221	230	187	68	17	68	2.49	63	106	339	550	571	466	169	42	169
Sumter	2%	3	5	16	26	27	22	8	2	8	2.49	7	12	40	65	67	55	20	5	20
Marion	35%	53	88	280	455	473	385	140	35	140	2.49	131	218	697	1,133	1,177	959	349	87	349
Hernando	2%	3	5	16	26	27	22	8	2	8	2.49	7	12	40	65	67	55	20	5	20
Levy	5%	8	13	40	65	68	55	20	5	20	2.49	19	31	100	162	168	137	50	12	50
Alachua	35%	53	88	280	455	473	385	140	35	140	2.49	131	218	697	1,133	1,177	959	349	87	349
Gilchrist	2%	3	5	16	26	27	22	8	2	8	2.49	7	12	40	65	67	55	20	5	20
Dixie	2%	3	5	16	26	27	22	8	2	8	2.49	7	12	40	65	67	55	20	5	20
Total	**100%**	**150**	**250**	**800**	**1,300**	**1,350**	**1,100**	**400**	**100**	**400**		**374**	**623**	**1,992**	**3,237**	**3,362**	**2,739**	**996**	**249**	**996**

(1) The distribution of workers is assumed to be constant through the operation schedule (Progress Energy, 2008 p.63)
(2) It is assumed that 50% of the workers need during operation will be migrant coming from outside the region (Progress Energy, 2008 p.62)
(3) Florida's average person per household is 2.49 (U.S. Census Bureau, 2008)

= WRWSA Members

APPENDIX SWFWMD WATER CONSERVATION MODEL

Contents

Water Conservation Model - Northern Planning Region Summary

- Water Savings Potential in SWFWMD
- Water Savings Potential in Northern Planning Area by Water Use, and Savings Potential by Conservation Measure
- Water Savings Potential in Northern Planning Area
- Raw Data from Water Conservation Model for the WRWSA.

Water Conservation Model – Northern Planning Region Summary

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Water Savings Potential in Northern Planning Area by Water Use, and Savings Potential by Conservation Measure

Northern Planning Region

Sector	Water Savings 2030 (MGD)	Average Cost Effectiveness ($/kgal)	Total Cost
Public Supply	19.66	$0.29	$24,572,317
Domestic Self Supply	1.41	$0.44	$2,649,325
Commercial/Industrial/Mining	0.06	$0.37	$91,535
Recreation/Aesthetic	0.04	$0.22	$41,570
Total	21.171	$0.30	$27,354,747

Clothes Washer Rebate

Sector	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	0.20	$2.02	$1,742,400
Domestic Self Supply	0.00	$0.00	$0
Total	**0.20**	$2.02	**$1,742,400**

Plumbing Retrofit Kit

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	0.72	$0.20	$607,356
Domestic Self Supply	0.09	$0.24	$87,600
Total	**0.80**	$0.20	**$694,956**

ULV Toilet Rebate

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	1.51	$1.04	$6,670,755
Domestic Self Supply	0.14	$1.18	$712,125
Commercial/Industrial/Mining	0.00	$1.18	$8,262
Total	**1.65**	$1.05	**$7,391,142**

Water Efficient Landscape and Irrigation Evaluation

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	5.09	$1.12	$8,966,320
Domestic Self Supply	0.36	$2.09	$1,196,000
Commercial/Industrial/Mining	0.00	$2.09	$9,384
Recreation/Aesthetic	0.00	$2.09	$10,350
Total	**5.46**	$1.19	**$10,182,054**

Large Landscape Survey

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	0.03	$0.53	$27,125
Recreation/Aesthetic	0.03	$0.53	$27,125
Total	**0.07**	$0.53	**$54,250**

Rain Sensor Shut-off Device

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	8.88	$0.28	$3,971,600
Domestic Self Supply	0.82	$0.51	$653,600
Commercial/Industrial/Mining	0.00	$0.51	$1,632
Recreation/Aesthetic	0.00	$0.51	$3,600
Total	**9.70**	$0.30	**$4,630,432**

Pre-rinse Spray Valve Rebate

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	0.54	$0.10	$225,032
Commercial/Industrial/Mining	0.00	$0.11	$1,877
Total	**0.54**	$0.10	**$226,909**

ICI Facility Assessment

	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	1.89	$0.28	$2,280,450
Commercial/Industrial/Mining	0.05	$0.35	$70,380
Total	**1.94**	$0.29	**$2,350,830**

Water Budgeting

Sector	Water Savings 2030 (GPD)	Cost Effectiveness ($/kgal)	Total Cost
Public Supply	0.80	$0.06	$81,279
Domestic Self Supply	0.00	$0.00	$0
Recreation/Aesthetic	0.00	$0.09	$495
Total	**0.80**	$0.06	**$81,774**

Water Savings Potential in Northern Planning Area

Northern Planning Region

County	Water Savings 2030 (MGD)
Hernando	3.99
Citrus	6.05
Levy	0.19
Lake	0.00
Marion	3.92
Sumter	6.99
Total	21.148

Raw Data from Water Conservation Model for the WRWSA

Citrus County

CITRUS COUNTY	2030 Population	2030 Demand (mgd)	Average GPCD (2003-07)	Potential GPCD 2030 from WC	Savings (mgd)	savings check (mgd)	Clothes Washer: Savings Rate (gpd)	Clothes Washer: # Measures	Clothes Washer: Savings per Utility (mgd)	Plumbing Retrofit Kit: Savings Rate (gpd)	Plumbing Retrofit Kit: # Measures	Plumbing Retrofit Kit: Savings per Utility (mgd)	ULV Toilet Rebate: Savings Rate (gpd)	ULV Toilet Rebate: # Measures	ULV Toilet Rebate: Savings per Utility (mgd)
City of Crystal River (207)	13,773	2.438	177	150	0.37	0.37	16.300	250.00	0.004	12.000	1200.00	0.014	27.000	1200.00	0.032
City of Inverness (419)	31,368	5.176	165	150	0.47	0.47	16.300		0.000	12.000	5250.00	0.063	27.000	5250.00	0.142
Floral City Water Association (1118)	7,850	0.440	56	53	0.02	0.02	16.300	6.00	0.000	12.000	125.00	0.002	27.000	125.00	0.003
All Citrus County WUPs	90,548	17.760	197	150	4.26	4.26	16.300	5000.00	0.082	12.000	9000.00	0.108	27.000	9000.00	0.243
Rolling Oaks Utilities Inc (4153)	12,777	2.274	178	150	0.36	0.36	16.300		0.000	12.000	1500.00	0.018	27.000	1750.00	0.047
Homasassa Special Water District (4406)	8,353	1.086	130	124	0.05	0.05	16.300		0.000	12.000		0.000	27.000		0.000
Walden Woods LTD (11839)	1,284	0.243	189	150	0.05	0.05	16.300		0.000	12.000	0.00	0.000	27.000	0.00	0.000
Gulf Highway Land Corporation (6691)	819	0.117	148	141	0.01	0.01	16.300		0.000	12.000	0.00	0.000	27.000	0.00	0.000
DSS	43,171	5.396	125	119	0.27	0.27	16.300	0.00	0.000	12.000	1200.00	0.014	27.000	1200.00	0.032
Small Utility	6,665	1.180	177	150	0.18	0.18	16.300	9.00	0.000	12.000	500.00	0.006	27.000	500.00	0.014
Additional Irrigation from Private Wells	4,496	1.349		0	0.07	0.07									
County Totals	**221,104**	**37.458**			**6.10**	**6.10**		**5265.0**	**0.1**		**17575.0**	**0.2**		**17825.0**	**0.5**

		Clothes Washer	Plumbing Retrofit Kit	ULV Toilet Rebate
PS $/1000	No. of measures	5,265	17,575	17,825
	Cost/measure	$160	$12	$135
	Total Cost for all measures	$842,400	$210,900	$2,406,375
	Cost/Kgal	$2.31	$0.24	$1.18
	Total Saved	**0.09**	**0.21**	**0.48**
DSS	No. of measures	0	1200	1200
	Cost/measure	$160	$12	$135
	Total Cost for all measures	$0	$14,400	$162,000
	Cost/Kgal	$0.00	$0.24	$1.18
	Total Saved	**0.00**	**0.01**	**0.03**

Citrus County

Lndscp & Irr Eval w/ Rebate			Rain Sensors			Water Budget			Pre-Rinse Spray Valves			ICI Facility Assessment			Lg Landscape Survey (ICI, Park, Rec on PS)		
Savings Rate (gpd)	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**
140.000	350.00	0.049	100.000	1200.00	0.120	78.000	0.00	0.000	200.000	150.00	0.030	2308.000	50.00	0.115	428.000	2.00	0.001
140.000	1000.00	0.140	100.000	1110.00	0.111	78.000		0.000	200.000		0.000	2308.000	4.00	0.009	428.000	2.00	0.001
140.000	50.00	0.007	100.000	100.00	0.010	78.000		0.000	200.000	0.00	0.000	2308.000	0.00	0.000	428.000	1.00	0.000
140.000	8500.00	1.190	100.000	12500.00	1.250	78.000	4840.00	0.378	200.000	400.00	0.080	2308.000	400.00	0.923	428.000	7.00	0.003
140.000	250.00	0.035	100.000	1510.00	0.151	78.000		0.000	200.000	100.00	0.020	2308.000	40.00	0.092	428.000	1.00	0.000
140.000	100.00	0.014	100.000	175.00	0.018	78.000		0.000	200.000	50.00	0.010	2308.000	5.00	0.012	428.000	2.00	0.001
140.000	100.00	0.014	100.000	360.00	0.036	78.000		0.000	200.000	0.00	0.000	2308.000	0.00	0.000	428.000	0.00	0.000
140.000		0.000	100.000	60.00	0.006	78.000		0.000	200.000	0.00	0.000	2308.000	0.00	0.000	428.000		0.000
140.000	500.00	0.070	100.000	1530.00	0.153	78.000		0.000	200.000	0.00	0.000	2308.000	0.00	0.000	428.000	0.00	0.000
140.000	250.00	0.035	100.000	1220.00	0.122	78.000		0.000	200.000		0.000	2308.000	0.00	0.000	428.000		0.000
140.00	20.00	0.0028	100.00	640	0.064												
	10600.0	**1.5**		**18235.0**	**1.8**		**4840.0**	**0.4**		**700.0**	**0.1**		**499.0**	**1.2**		**15.0**	**0.0**
	10,600			18,235			4,840			700			499			15	
	$460			$80			$11			$92			$3,450			$875	
	$4,876,000			$1,458,800			$53,240			$64,400			$1,721,550			$13,125	
	$2.09			$0.51			$0.09			$0.11			$0.35			$1.30	
	1.48			**1.82**			**0.38**			**0.14**			**1.15**			**0.01**	
	500			1530			0										
	$460			$80			$11										
	$230,000			$122,400			$0										
	$2.09			$0.51			$0.00										
	0.07			**0.15**			**0.00**										

COUNTY SAVINGS
5.76 PS

0.02 ICI & REC

0.27 DSS
6.05 TOTALS

Hernando County

HERNANDO COUNTY	2030 Population	2030 Demand (mgd)	Average GPCD (2003-07)	Potential GPCD 2030 from WC	Savings (mgd)	savings check (mgd)	Clothes Washer: Savings Rate (gpd)	Clothes Washer: # Measures	Clothes Washer: Savings per Utility (mgd)	Plumbing Retrofit Kit: Savings Rate (gpd)	Plumbing Retrofit Kit: # Measures	Plumbing Retrofit Kit: Savings per Utility (mgd)	ULV Toilet Rebate: Savings Rate (gpd)	ULV Toilet Rebate: # Measures	ULV Toilet Rebate: Savings per Utility (mgd)
Hernando County Water and Sewer (*)	176,076	30.109	171	150	3.70	3.70	16.30	4000.00	0.065	12.00	24085.00	0.289	27.00	24085.00	0.650
City of Brooksville (7627)	20,528	2.279	111	105	0.12	0.12	16.30		0.000	12.00	1450.00	0.017	27.00	1450.00	0.039
DSS	43,332	5.720	132	130	0.09	0.09	16.30		0.000	12.00	900.00	0.011	27.00	775.00	0.021
Small Utility	5,365	0.874	163	150	0.07	0.07	16.30	250.00	0.004	12.00	200.00	0.002	27.00	200.00	0.005
Additional Irrigation from Private Wells	14,777	4.433			0.11	0.11									
County Totals	**260,078**	**43.415**			**4.088**	**4.088**		**4250.000**	**0.069**		**25735.000**	**0.309**		**25735.000**	**0.695**
				PS $/1000	No. of measures			4,250			25,735			25,735	
					Cost/measure			$160			$12			$135	
					Total Cost for all measures			$680,000			$308,820			$3,474,225	
					Cost/Kgal			$2.31			$0.24			$1.18	
					Total Saved			**0.07**			**0.31**			**0.69**	
				DSS	No. of measures			0			900			775	
					Cost/measure			$160			$12			$135	
					Total Cost for all measures			$0			$10,800			$104,625	
					Cost/Kgal			$0.00			$0.24			$1.18	
					Total Saved			**0.00**			**0.01**			**0.02**	

Hernando County

Lndscp & Irrigation Eval			Rain Sensors			Water Budget			Pre-Rinse Spray Valves			ICI Facility Assessment			Lg Landscape Survey (ICI, Park, Rec on PS)		
Savings Rate (gpd)	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# Measures**	**Savings per Utility (mgd)**
140.00	3000.00	0.420	100.00	18800.00	1.880	78.00		0.000	200.00	1500.00	0.300	2308.00	40.00	0.092	428.00	3.00	0.001
140.00	20.00	0.003	100.00	600.00	0.060	78.00		0.000	200.00	16.00	0.003	2308.00		0.000	428.00		0.000
140.00		0.000	100.00	550.00	0.055	78.00		0.000	200.00		0.000	2308.00		0.000	428.00		0.000
140.00	165.00	0.023	100.00	350.00	0.035	78.00		0.000	200.00		0.000	2308.00		0.000	428.00		0.000
140.00		0.000	100.00	1110.00	0.111			0.000									
	3185.000	**0.446**		**19750.000**	**1.975**		**0.000**	**0.000**		**1516.000**	**0.303**		**40.000**	**0.092**		**3.000**	**0.001**
	3,185			19,750			0			1,516			40			3	
	$460			$80			$11			$92			$3,450			$875	
	$1,465,100			$1,580,000			$0			$139,472			$138,000			$2,625	
	$2.09			$0.51			$0.00			$0.11			$0.35			$1.30	
	0.45			**1.98**			**0.00**			**0.30**			**0.09**			**0.00**	
	0			550			0										
	$460			$80			$11										
	$0			$44,000			$0										
	$0.00			$0.51			$0.00										
	0.00			**0.06**			**0.00**										

COUNTY SAVINGS
3.89 PS

0.02 ICI & REC

0.09 DSS
3.99 TOTALS

Marion County

MARION COUNTY

	2030 Population	2030 Demand (mgd)	Average GPCD (2003-07)	Potential GPCD 2030 from WC	Savings (mgd)	savings check (mgd)	Clothes Washer			Plumbing Retrofit Kit			ULV Toilet Rebate		
							Savings Rate (gpd)	# of Measures	Savings per Utility (mgd)	Savings Rate (gpd)	# of Measures	Savings per Utility (mgd)	Savings Rate (gpd)	# of Measures	Savings per Utility (mgd)
Marion County Utilities / Summerglen (377)	39,787	5.093	128	122	0.255	0.255	16.30		0.000	12.00	1000.00	0.012	27.00	900.00	0.024
On Top of The World Communities Inc (1156)	10,645	2.949	277	194	0.885	0.885	16.30	0.00	0.000	12.00		0.000	27.00		0.000
Marion Utilities Inc. (2999)	681	0.127	187	150	0.025	0.025	16.30	20.00	0.000	12.00	42.00	0.001	27.00	42.00	0.001
Rainbow Springs Utilities LC (4257)	4,424	0.978	221	165	0.248	0.248	16.30	300.00	0.005	12.00	600.00	0.007	27.00	500.00	0.014
Utilities Inc. of Florida / Golden Hills (5643)	2,449	0.238	97	92	0.012	0.012	16.30		0.000	12.00	80.00	0.000	27.00	80.00	0.002
Marion County Utilities (6151)	15,870	2.841	179	150	0.455	0.455	16.30	350.00	0.006	12.00	1500.00	0.018	27.00	1500.00	0.041
Sateke Village Utilities Hoa (6290)	88	0.011	124	118	0.001	0.001	16.30		0.000	12.00	0.00	0.000	27.00	0.00	0.000
Sun Communities Operating LP (6792)	845	0.123	146	139	0.006	0.006	16.30	0.00	0.000	12.00	0.00	0.000	27.00	0.00	0.000
Marion Utilities Inc. (7849)	1,166	0.216	185	150	0.041	0.041	16.30	80.00	0.001	12.00	85.00	0.001	27.00	85.00	0.002
Century Fairfield Village LTD (8005)	513	0.107	208	150	0.030	0.030	16.30	25.00	0.000	12.00	0.00	0.000	27.00	0.00	0.000
Marion Landingd HOA (8020)	1,196	0.188	157	141	0.019	0.019	16.30		0.000	12.00		0.000	27.00		0.000
Marion County Utilities / Quail Meadow (8165)	1,295	0.281	217	160	0.074	0.074	16.30	50.00	0.001	12.00	182.00	0.002	27.00	182.00	0.005
City of Dunnellon (8339)	10,151	1.269	125	106	0.190	0.164	16.30		0.000	12.00	100.00	0.001	27.00	100.00	0.003
Marion Utilities Inc. / Spruce Creek (8481)	7,246	1.746	241	193	0.349	0.349	16.30	25.00	0.000	12.00	550.00	0.007	27.00	550.00	0.015
Windstream Utilities Co (9360)	3,152	1.289	409	342	0.211	0.211	16.30	20.00	0.000	12.00	150.00	0.002	27.00	150.00	0.004
Upchurch Marinas / Sweetwater (9425)	452	0.125	277	208	0.031	0.031	16.30	10.00	0.000	12.00	0.00	0.000	27.00	0.00	0.000
Marion County Utilities (11752)	2,149	1.152	536	454	0.177	0.177	16.30	300.00	0.005	12.00	219.00	0.003	27.00	219.00	0.006
Marion County Utilities / Spruce Creek (12218)	1,914	0.932	487	410	0.148	0.148	16.30	45.00	0.001	12.00	195.00	0.002	27.00	195.00	0.005
DSS	77,352	10.365	134	127	0.518	0.518	16.30		0.000	12.00	2500.00	0.030	27.00	2500.00	0.068
Small Utility	9,973	1.765	177	150	0.265	0.265	16.30	150.00	0.002	12.00	1000.00	0.012	27.00	1000.00	0.027
Additional Irrigation from Private Wells	2,724	0.817			0.016	0.016									
County Totals	**194,072**	**32.611**			**3.95**	**3.93**		**1375**	**0**		**5703**	**0**		**5503**	**0**

	PS $/1000	No. of measures	1,375	5,703	5,503
		Cost/measure	$160	$12	$135
Accounts		Total Cost for all measures	$220,000	$68,436	$742,905
		Cost/Kgal	$2.31	$0.24	$1.18
		Total Saved	**0.02**	**0.07**	**0.15**
Permit	DSS	No. of measures	0	2500	2500
377		Cost/measure	$160	$12	$135
2999		Total Cost for all measures	$0	$30,000	$337,500
6151		Cost/Kgal	$0.00	$0.24	$1.18
7849		**Total Saved**	**0.00**	**0.03**	**0.07**
8165					
8481					
11752					
12218					

# of res accounts	**Pre-95**
7802	4057
134	69
3112	1618
229	119
254	132
1421	739
421	219
375	195

Marion County

Lndscp & Irr Eval w/ Rebate			Rain Sensors			Water Budget			Pre-Rinse Spray Valves			ICI Facility Assessment			Lg Landscape Survey (ICI, Park, Rec on PS)		
Savings Rate (gpd)	**# of Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# of Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# of Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# of Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# of Measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**# of Measures**	**Savings per Utility (mgd)**
140.00	250.00	0.035	100.00	1500.00	0.150	78.00		0.000	200.00	50.00	0.010	2308.00	10.00	0.023	428.00	2.00	0.001
140.00	300.00	0.042	1000.00	828.00	0.828	78.00		0.000	200.00	15.00	0.003	2308.00	5.00	0.012	428.00	1.00	0.000
140.00	80.00	0.011	100.00	120.00	0.012	78.00		0.000	200.00		0.000	2308.00		0.000	428.00		0.000
140.00	645.00	0.090	100.00	1275.00	0.128	78.00		0.000	200.00		0.000	2308.00	2.00	0.005	428.00		0.000
140.00		0.000	100.00	100.00	0.010	78.00		0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00		0.000
140.00	850.00	0.119	100.00	1650.00	0.165	78.00	800.00	0.062	200.00	45.00	0.009	2308.00	15.00	0.035	428.00	2.00	0.001
140.00		0.000	100.00	10.00	0.001	78.00	0.00	0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00	0.00	0.000
140.00		0.000	100.00	60.00	0.006	78.00	0.00	0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00	0.00	0.000
140.00	90.00	0.013	100.00	190.00	0.019	78.00		0.000	200.00		0.000	2308.00	2.00	0.005	428.00		0.000
140.00	110.00	0.015	100.00	140.00	0.014	78.00	0.00	0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00	0.00	0.000
140.00	0.00	0.000	100.00	190.00	0.019	78.00	0.00	0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00	0.00	0.000
140.00	180.00	0.025	100.00	220.00	0.022	78.00	180.00	0.014	200.00		0.000	2308.00	2.00	0.005	428.00		0.000
140.00	100.00	0.014	100.00	500.00	0.050	78.00		0.000	200.00	75.00	0.015	2308.00	35.00	0.081	428.00	1.00	0.000
140.00	1000.00	0.140	100.00	1200.00	0.120	78.00	2.00	0.000	200.00	40.00	0.008	2308.00	25.00	0.058	428.00	3.00	0.001
140.00	636.00	0.089	100.00	636.00	0.064	78.00	636.00	0.050	200.00		0.000	2308.00	1.00	0.002	428.00		0.000
140.00	65.00	0.009	110.00	100.00	0.011	78.00	110.00	0.009	200.00		0.000	2308.00	1.00	0.002	428.00		0.000
140.00	435.00	0.061	100.00	435.00	0.044	78.00	435.00	0.034	200.00	5.00	0.001	2308.00	10.00	0.023	428.00	2.00	0.001
140.00	386.00	0.054	100.00	386.00	0.039	78.00	386.00	0.030	200.00		0.000	2308.00	7.00	0.016	428.00	1.00	0.000
140.00	100.00	0.014	100.00	4060.00	0.406	78.00	0.00	0.000	200.00	0.00	0.000	2308.00	0.00	0.000	428.00	0.00	0.000
140.00	250.00	0.035	100.00	1720.00	0.172	78.00		0.000	200.00		0.000	2308.00	7.00	0.016	428.00	1.00	0.000
140.00	60.00	0.008	100.00	80.00	0.008	78.00		0.000									
	5377	**1**		**11260**	**2**		**2549**	**0**		**230**	**0**		**122**	**0**		**13**	**0**

5,377	11,260	2,549	230	122	13
$460	$80	$11	$92	$3,450	$875
$2,473,420	$900,800	$28,039	$21,160	$420,900	$11,375
$2.09	$0.31	$0.09	$0.11	$0.35	$0.48
0.75	**1.87**	**0.20**	**0.05**	**0.28**	**0.01**
100	4060	0			
$460	$80	$11			
$46,000	$324,800	$0			
$2.09	$0.51	$0.00			
0.01	**0.41**	**0.00**			

COUNTY SAVINGS
3.40 PS
0.01 ICI & REC
0.52 DSS
3.92 TOTALS

Sumter County

SUMTER COUNTY

	2030 Population	2030 Demand (mgd)	Average GPCD (2003-07)	Potential GPCD 2030 from WC	Savings (mgd)	savings check (mgd)	Clothes Washer Savings Rate (gpd)	Clothes Washer #measures	Clothes Washer Savings per Utility (mgd)	Plumbing Retrofit Kit Savings Rate (gpd)	Plumbing Retrofit Kit #measures	Plumbing Retrofit Kit Savings per Utility (mgd)	ULV Toilet Rebate Savings Rate (gpd)	ULV Toilet Rebate #measures	ULV Toilet Rebate Savings per Utility (mgd)
Lake Panasoffkee Water Assoc. Inc. (1368)	6,816	0.525	77	73	0.03	0.03	16.30	0	0.000	12.00	500	0.006	27.00	100	0.003
Continental Country Club RO Inc. (2622)	3,204	0.471	147	140	0.02	0.02	16.30	0	0.000	12.00	300	0.004	27.00	100	0.003
City of Bushnell (6519)	6,828	1.270	186	150	0.25	0.25	16.30	100	0.002	12.00	600	0.007	27.00	300	0.008
City of Webster (7185)	1,800	0.205	114	108	0.01	0.01	16.30	0	0.000	12.00	350	0.004	27.00	0	0.000
Cedar Acres, Inc. (7799)	1,293	0.091	70	67	0.00	0.00	16.30	0	0.000	12.00	150	0.002	27.00	0	0.000
City of Wildwood (8135)	33,274	5.557	167	150	0.57	0.55	16.30	500	0.008	12.00	4000	0.048	27.00	3000	0.081
City of Center Hill (8193)	2,526	0.177	70	67	0.01	0.01	16.30	0	0.000	12.00	300	0.004	27.00	0	0.000
Sumter WCA / Villages WCA / N Sumter (13005)	88,069	19.111	217	150	5.90	5.63	16.30	1000	0.016	12.00	3000	0.036	27.00	3000	0.081
DSS	57,729	8.371	145	138	0.40	0.40	16.30	0	0.000	12.00	2000	0.024	27.00	500	0.014
Small Utility	1,997	0.367	184	150	0.07	0.07	16.30	0	0.000	12.00	500	0.006	27.00	250	0.007
Additional Irrigation from Private Wells	1,747	0.524			0.03	0.03									
Sumter County Totals	**205,283**	**36.668**			**7.28**	**6.99**		**1600**	**0**		**9700**	**0**		**6750**	**0**

		Clothes Washer	Plumbing Retrofit Kit	ULV Toilet Rebate
PS $/1000	No. of measures	0	500	250
	Cost/measure	$160	$12	$135
	Total Cost for all measures	$0	$6,000	$33,750
	Cost/Kgal	$0.00	$0.01	$0.04
	Total Saved	**0.03**	**0.12**	**0.18**
DSS	No. of measures	0	2000	500
	Cost/measure	$160	$12	$135
	Total Cost for all measures	$0	$24,000	$67,500
	Cost/Kgal	$0.00	$0.24	$1.18
	Total Saved	**0.00**	**0.02**	**0.01**

Sumter County

Lndscp & Irr Eval			Rain Sensors			Water Budget			Pre-Rinse Spray Valves			ICI Facility Assessment			Lg Landscape Survey (ICI, Park, Rec on PS)		
Savings Rate (gpd)	**#measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**#measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**#measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**#measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**#measures**	**Savings per Utility (mgd)**	**Savings Rate (gpd)**	**#measures**	**Savings per Utility (mgd)**
140.00	50	0.007	100.00	100	0.010	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	50	0.007	100.00	50	0.005	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	500	0.070	100.00	500	0.050	78.00	100	0.008	200.00	35	0.007	2308.00	40	0.092	428.00	10	0.004
140.00	10	0.001	100.00	10	0.001	78.00	0	0.000	200.00	5	0.001	2308.00	0	0.000	428.00	0	0.000
140.00	10	0.001	100.00	10	0.001	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	1200	0.168	100.00	1000	0.100	78.00	250	0.020	200.00	100	0.020	2308.00	45	0.104	428.00	15	0.006
140.00	10	0.001	100.00	25	0.003	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	15000	2.100	100.00	30000	3.000	78.00	2500	0.195	200.00	100	0.020	2308.00	75	0.173	428.00	20	0.009
140.00	1500	0.210	100.00	1500	0.150	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	200	0.028	100.00	250	0.025	78.00	0	0.000	200.00	0	0.000	2308.00	0	0.000	428.00	0	0.000
140.00	100	0.014	100.00	120	0.012	78.00	0	0.000									
	17030	**2**		**31945**	**3**		**2850**	**0**		**240**	**0**		**160**	**0**		**45**	**0**
	200			250			0			0			0			0	
	$460			$80			$11			$92			$3,450			$875	
	$92,000			$20,000			$0			$0			$0			$0	
	$0.02			$0.00			$0.00			$0.00			$0.00			$0.00	
	2.38			**3.19**			**0.22**			**0.05**			**0.37**			**0.02**	
	1500			1500			0										
	$460			$80			$11										
	$690,000			$120,000			$0										
	$2.09			$0.51			$0.00										
	0.21			**0.15**			**0.00**										

COUNTY SVAINGS
6.56 PS

0.03 ICI & REC

0.40 DSS
6.99 TOTALS