

I. Introduction/Purpose

In August 2001 the Governing Board approved the District's first Regional Water Supply Plan (RWSP) prepared pursuant to Section 373.0361, F.S. The RWSP was prepared for a ten-county area of the District, extending from Pasco County south to Charlotte County. The RWSP identified 364 million gallons a day (mgd) growth in water demands within this ten county area between 1995 and the year 2020. This quantity is over and above the 74 mgd of water needed to reduce withdrawals at Tampa Bay Water's major wellfields (68 mgd) and to meet minimum flow requirements for the lower Hillsborough River (6 mgd). To meet these needs, the RWSP identified nearly 680 mgd in alternative supplies and demand management.

Subsequent to approval of the RWSP, the District is required to prepare a Five-Year Water Resource Development Work Program as a part of its annual budget reporting process, pursuant to Subsection 373.536(6), F.S. *"The program must describe the district's implementation strategy for the water resource development component of each approved regional water supply plan developed or revised under s. 373.0361. The work program must address all the elements of the water resource development component in the district's approved regional water supply plans."* (Subsection 373.536(6), F.S.) This report represents the District's third Five-Year Water Resource Development Work Program and covers the period from FY2003 through FY2007.

II. Water Resource Development

Chapter 373, F.S. defines water resource development as *"the formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and ground-water data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation, and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and ground-water recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities."* (. 373.019(19), F.S.). The intent for water resource development projects is to enhance the amount of water available for water supply development. The District is primarily responsible for water resource development projects. The water resource development component of the District's RWSP identifies a series of data collection and analysis activities the District is undertaking which meet this statutory definition. The implementation strategy for this water resource development category of the RWSP is contained in Section II.A of this report.

In addition, for purposes of annual budget reporting, the Executive Office of the Governor has more narrowly defined water resource development “projects” as “regional projects designed to create, from traditional or alternative sources, an identifiable, quantifiable supply of water for existing and/or future reasonable beneficial uses.” Section II.B of this report identifies the implementation strategy for this more narrowly defined category of projects.

Since the draft of this Work Program was released in October of 2003, a significant change has been made to the document. This change is a revision of the Hillsborough River Watershed Reclaimed Water Project. The project has been renamed and is now the Tampa Bay Regional Reclaimed Water and Downstream Augmentation Project. The scope and the cost of the project has increased significantly. Specifically, Tampa Bay Water has been added as a partner to develop the Tampa Bypass Canal downstream augmentation and potable exchange portion of the project. In addition, a wet weather storage and aquifer recharge component has been added by Hillsborough County. The addition of these projects has increased the total cost of the project by \$83 million. Finally, a reevaluation of the benefits of this project has reduced the potable water offset of the project from 31 to 26 mgd.

A. Water Resource Development (Data Collection and Analysis)

The District has budgeted significant funds in FY2004 to implement the water resource development component of the RWSP. The activities summarized in Table 1 are mainly data collection and analysis activities that support water supply development by local governments, utilities, regional water supply authorities and others. The Table indicates that over \$25 million will be allocated each year toward these activities between FY2004 and FY2008 for a total of over \$126 million. Because budgets for the years beyond FY2004 have not yet been developed, funds for fiscal years FY2005 through FY2008 were set equal to FY2004 funding. This is thought to be valid because even though funding for each activity is expected to vary somewhat each year, the total cost of data collection and analysis activities for each fiscal year is expected to remain relatively constant through 2008. Funding for these activities is from the District's Governing Board and Basin Boards, water supply authorities, local governments, and the U.S. Geological Survey (USGS). Following Table 1, each of the projects is further described.

Table 1. Major Water Resource Development Data Collection and Analysis Activities

Project	FY2004 Costs (\$)	FY2005 Costs (\$)	FY2006 Costs (\$)	FY2007 Costs (\$)	FY2008 Costs (\$)	Total Costs (\$)	Funding Source
1) Hydrologic Data Collection	\$3,229,510	\$3,229,510	\$3,229,510	\$3,229,510	\$3,229,510	\$16,147,550	SWFWMD, USGS
2) Regional Observation Monitoring Program	\$2,453,246	\$2,453,246	\$2,453,246	\$2,453,246	\$2,453,246	\$12,266,230	SWFWMD, local partnerships
3) Quality of Water Improvement Program	\$640,630	\$640,630	\$640,630	\$640,630	\$640,630	\$3,203,150	SWFWMD
4) Flood Control Projects							
a) Data Collection	Included in Hydrologic Data Collection	Included in Hydrologic Data Collection	Included in Hydrologic Data Collection	Included in Hydrologic Data Collection	Included in Hydrologic Data Collection		SWFWMD, USGS
b) Remediating Existing Problems	\$11,529,340	\$11,529,340	\$11,529,340	\$11,529,340	\$11,529,340	\$57,646,700	SWFWMD, local govt. cooperators
c) CWM Initiative	\$2,624,868	\$2,624,868	\$2,624,868	\$2,624,868	\$2,624,868	\$13,124,340	SWFWMD
d) Lake Levels/MFLs Program	\$3,172,703	\$3,172,703	\$3,172,703	\$3,172,703	\$3,172,703	\$15,863,515	SWFWMD
5) Hydrologic Investigations							SWFWMD, USGS, local govt. cooperators
a) USGS Hydrologic Studies	\$741,000	\$741,000	\$741,000	\$741,000	\$741,000	\$3,705,000	SWFWMD/USGS
b) Water Resource Assessment Projects	\$851,601	\$851,601	\$851,601	\$851,601	\$851,601	\$4,258,005	SWFWMD/USGS
Total	\$25,242,898	\$25,242,898	\$25,242,898	\$25,242,898	\$25,242,898	\$126,214,490	

Source for FY2004: SWFWMD FY2004 Summarized Programmatic Activities Report

1) Hydrologic Data Collection - (page 232 of the RWSP) The District has a comprehensive hydrologic conditions monitoring program. This program includes data collected by District staff and permittees, as well as data collected as part of the District's cooperative program with the USGS. Data collected from this program allow the District to gauge changes in the health of the water resource, monitor trends in conditions, identify and analyze existing or potential resource problems, and develop programs to correct existing problems and prevent future problems from occurring. The primary hydrologic conditions that are monitored include rainfall, evapotranspiration, lake levels, discharge and stage height of major streams, ground-water levels, various water quality parameters of both surface and ground water (including springs), and water use. In addition, the District monitors ecological conditions as they relate to both potential water use impacts and changes in hydrologic conditions. The District also monitors data submitted by Water Use Permit (WUP) holders to ensure compliance with permit conditions and to assist in monitoring hydrologic conditions.

2) Regional Observation Monitoring Program (ROMP) - (page 233 of the RWSP) This program has increased the density of the District's ground-water monitoring network since the mid-1970s by constructing additional monitor wells. The data from these monitoring sites are used to evaluate seasonal and long-term changes in ground-water levels and quality, and the interaction and connectivity between ground-water and surface-water bodies. The ROMP also performs geophysical logging on existing wells to provide needed data on well construction and water quality, most of which is incorporated into the District's Geographical Information System (GIS) database. Impacts resulting from increased water demand over the past 30 years have been documented and assessed through analysis of ground-water data. These impacts directly affect the District's planning, regulatory policies and programs. For example, ground-water data are used during the permitting process to model potential impacts of new uses. This information is also used to monitor existing permittees to prevent them from significantly impacting natural systems and existing legal users. Construction of new monitor wells also provides the opportunity to collect valuable technical information such as the geologic core that is recovered from various depths and water quality, and potentiometric levels. From these data, aquifers and confining units are delineated, location of the freshwater/ saltwater interface is determined and water quality within aquifers is characterized. The installation of long-term ground-water monitoring sites for the next few years will continue to target the District's Water Use Caution Areas (WUCA). This will provide additional data for the Water Resource Assessment Projects (WRAP), well performance data for wellhead protection projects and the aquifer characteristics inventory.

3) Quality of Water Improvement Program (QWIP) – (page 233 of the RWSP) The QWIP was established in 1974 through Chapter 373, F.S., to restore ground-water conditions altered by well drilling activities. The QWIP's primary goal is to preserve ground- and surface-water resources through proper well abandonment. Plugging abandoned artesian wells eliminates the waste of water at the surface and the degradation of ground water from inter-aquifer contamination. Wells constructed prior to current well construction standards are often deficient in casing and expose several aquifers of varying water quality to one common wellbore. Thousands of these wells are in existence and they allow potable water supplies to be contaminated with mineralized water from deeper aquifers. Contaminated water and potable water can flow to the surface, which wastes water and can contaminate surface water.

Plugging wells involves filling the abandoned well with cement. Confinement is thus reestablished and mixing of varying water qualities and free flow is stopped. Prior to plugging an abandoned well, the well is geophysically logged to determine the proper plugging method and to provide background water quality and geologic data for inclusion in the District's database. These data are used in the WRAP studies discussed later to determine changes in water quality. The emphasis of this program is primarily in the coastal portions of the Southern Water Use Caution Area (SWUCA) where the aquifer is confined and flowing wells can exist. Chapter 373, F.S., requires that artesian systems, those areas where water in a well will rise naturally above the confining unit, be specifically addressed.

Historically, the QWIP has proven to be a cost-effective method to prevent waste and contamination of potable water resources, both ground and surface waters. In January 1994, the District increased QWIP funding as an incentive for property owners to comply with well plugging requirements contained in the Florida Statutes.

4) Flood Control Projects – (page 234 of the RWSP) The District undertakes a number of flood protection activities. These activities include data collection, remediation of existing flood protection problems, the Comprehensive Watershed Management (CWM) initiative, and lake levels program. Each of these flood protection efforts is described below:

- a) Data Collection - Data collection related to flood protection includes the regular assembly of information on such key indicators as rainfall, water levels and stream flows. The District's capability to assist in flood control has continued to improve during the past several years with the expansion of the District's Supervisory Control And Data Acquisition (SCADA) system. This computerized data collection system comprises the cornerstone of the District's flood data

collection, through a District-wide network of more than 117 real time and near-real time water level and rainfall data collection stations. The term “real time” means that the data are available within minutes of being measured, whereas near-real time means that the data are reported within four hours of being measured.

The SCADA system provides an early warning mechanism that allows flood problems to be anticipated by observing water level and rainfall trends. This information, which is automatically transmitted to District headquarters by radio, allows the District to operate its structures much more effectively during rainfall events and provides limited capability to remotely operate gates at water control structures. The system was designed with several fail-safe components to keep it operational during major storm events, when traditional communication lines may be inoperable.

The amount and detail of rainfall and stream level data now available for use by modelers has expanded significantly in recent years. In addition to the 53 real time rainfall sites, the District operates 27 near-real time rainfall sites, and 40 other recording rainfall gauges. These instruments record rainfall accumulations at least once per hour, and in many cases even more frequently. More recording rain gauges are being installed to develop a dense, District wide network of precipitation data.

The USGS monitors flow on all major rivers and streams in west-central Florida. During the past two years, mostly through a cooperatively funded program with the District, the USGS has instrumented 60 sites on these rivers and streams with data collection instruments that have the capability to relay data in near-real time by satellite. These data are posted on the USGS' Internet Web site, increasing accessibility for the many entities who use this information.

- b) Remediating Existing Problems - While much of the District's focus is on prevention, existing flood problem areas can be addressed in numerous ways. The District is working with local governments through the Flood Protection Coordination Initiative to set priorities for remedial actions to address existing problems. Such actions may include conveyance improvements, creation of flood storage, relocation of structures out of flood prone areas, or other initiatives. Much of the funding for these projects is provided through the District's Basin Boards. Projects can be funded entirely by the Basin Board or shared equally between the Basin Board and a local cooperator.

- c) CWM Initiative - This program is more fully described in the Watershed Management Chapter of the District Water Management Plan. With regard to flood protection, CWM provides a comprehensive analysis of surface-water hydrology and flooding issues for each of 11 major watersheds in the District. At a broad scale, CWM analyses help to identify existing problems and potential future problem areas through use of GIS technology and local involvement, and develop cross-disciplinary solutions.
- d) Lake Levels Program - The District's Lake Levels Program, established in the 1970s, has provided adopted management levels for over 400 lakes throughout the District. Flood stage information from this program is used by many local governments in regulating development adjacent to lakes, as well as by the District in public flood protection education efforts. Information relative to flood protection from the Lake Levels Program is contained in the District publication, Flood-Stage Frequency Relations for Selected Lakes. This report, a compilation of flood level information for all lakes for which it is available, has been distributed to numerous local governments and is available from the District upon request.

The Lake Levels Program merged with the District's Minimum Flows and Levels (MFLs) program in an effort to expand and enhance the management and protection of surface and ground-water resources.

5) Hydrologic Investigations – (page 240 of the RWSP) Hydrologic investigations include USGS Hydrologic Studies and detailed District studies entitled WRAPs, each of which are described below:

- a) USGS Hydrologic Studies - The District has a long-term cooperative program with the USGS to collect hydrologic data and conduct regional hydrogeologic investigations. The goals of this program are to monitor for changes in the hydrologic system and improve the understanding of cause and effect relationships. Funding for this program is generally on a 50/50 cost share basis with the USGS. However, this varies based on whether other cooperators are involved in the project and if requests for non-routine data collection or special project assignments are implemented.

Hydrologic data collection is a large part of the cooperative program and is closely coordinated with the District's Hydrologic Data Section. The USGS provides ongoing monitoring of ground-water levels at 177 sites, surface-water flows at 82 sites, and water levels at 33 lakes within the entire District.

Regional investigations of the hydrogeology of the District are an important aspect of the cooperative program. These investigations are intended to augment work conducted by District staff and are focused on improving the understanding of cause and effect relationships and developing analytical tools to be used in resource evaluations. In the past these investigations have included: 1) development of computer models of the regional ground-water flow systems for the SWFWMD, Highlands Ridge WUCA, Hardee and DeSoto counties, Cypress Creek, Cross Bar, and Morris Bridge wellfields, and the St. Petersburg aquifer storage and recovery (ASR) site, 2) detailed analysis of the hydrologic budgets for two benchmark lakes (Lucerne and Starr), 3) hydrogeologic characterization of the intermediate aquifer, and 4) hydrologic assessments of the Peace and Alafia Rivers.

In recent years, this program has included projects to determine the effects of using ground water to augment stressed lakes and investigation of factors influencing coastal spring flows. Ongoing projects include: evaluation of the effects of using ground water for supplemental hydration of wetlands; hydrogeologic characterization of the intermediate aquifer system; use of ground-water isotopes to estimate lake seepage; statistical characterization of lake level fluctuations; and investigation of the hydrology of the Upper Hillsborough River Basin.

- b) Water Resource Assessment Projects (WRAPs) - In the late 1980s, the District initiated a program to conduct WRAPs to assess water availability in several regions and to support the development and establishment of MFLs. These projects are detailed assessments of regional water resources and include intensive data collection and monitoring to characterize hydrologic conditions and determine effects of water withdrawals. There are five areas in the District for which WRAPs have been initiated. The first three WRAPs were initiated in the late 1980s and early 1990s for the Northern Tampa Bay (NTB), Eastern Tampa Bay (ETB), and Highlands Ridge (HR) areas. These projects were initiated in response to falling lake levels, drying of wetlands, and the increased landward movement of the freshwater/saltwater interface. In the mid-1990s, a fourth WRAP was initiated that covered the southern portion of the District and encompassed both the ETB and HR WRAPs. A fifth WRAP is being conducted for the northern portion of the District, primarily focusing on areas north of Pasco County. The data collection element for the Northern District WRAP was initiated in 1998 to provide baseline hydrologic conditions. The ETB WRAP was completed in 1993 and the NTB WRAP was completed in 1996. The Southern District WRAP and a ground-water flow model, developed as part of the Northern

District WRAP program are scheduled to be complete by 2005. Completion of these projects provides the foundation for determining water availability and can assist in the establishment of MFLs. Once the studies are completed, water resource management programs established in these areas can be modified as necessary.

In 1999, the District initiated the NTB Phase II investigation as a follow-up to the NTB WRAP. Through a series of projects, this study will continue assessments of the biologic and hydrologic systems in NTB to support the ongoing development of MFLs, water resources recovery, water use permitting, and environmental resource permitting. Projects will include the further development of MFLs methodologies, assessments of various techniques for restoring water levels in surface-water features, and expanded biologic and hydrologic data collection. These studies will continue through 2010.

A key component of the NTB Phase II study is the extensive network of hydrologic and biologic data collection sites. The significant data collection network currently maintained by the District, Tampa Bay Water, and local governments will be reassessed, updated, and expanded as part of the study. Impacts to surface-water features are generally the most limiting factor to water supply development in the NTB area. Because the data from monitoring sites in surface-water features will form the basis of decisions concerning key water management issues, it is critical that data in the NTB area be collected for various types of systems, and spread throughout the study area. Specific target areas for expansion and upgrade include hydrologic and biologic data collection in a wider variety of wetland types, increased spatial coverage of wetland and nested aquifer monitor wells and staff gauges, and data collection in areas of minimal hydrologic impacts for control purposes. Upon completion, the District and Tampa Bay Water's combined network is projected to include over 600 wetland monitoring sites and over 500 aquifer monitoring sites.

B. Water Resource Development "Projects"

The District currently has 17 projects that meet the more narrow definition of water resource development "projects." The total cost of these projects is \$264.4 million and over 41 mgd of additional water supply will be produced. The District has allocated \$16.9 million for these projects in FY2004. Beyond 2004, it becomes difficult to accurately determine the amount of funding that will be allocated to the projects each year. At least one of the projects will not be completed by 2008 and a significant portion of the funding will also not be spent by 2008. District funding for a number of these

projects is matched to varying degrees by local cooperators, including local governments, regional water supply authorities and others. In addition, a number of projects have received state and federal funding. District funds for these projects are being generated through a number of different mechanisms described in Section IV of this report. Following Table 2, each of the projects is described in detail.

Table 2. Total Project Cost and FY2004 - FY2008 District Funding for Water Resource Development Projects

Project	Total Prior District Funding (\$)	FY2004 District Cost (\$)	FY2005 District Cost (\$)	FY2006 District Cost (\$)	FY2007 District Cost (\$)	FY2008 District Cost (\$)	Total Cost District + Cooperator	Funding Source	Water Quantity to be Developed (mgd)
1) Alternative Water Supply Research and/or Pilot Projects									
a) Fate of Microorganisms in Fld. Aq.	180,282	5,766					361,048	SFWMD SWFWMD	N/A
b) Evaluation of ASR Systems	125,976	46,740					172,716	SWFWMD	N/A
c) Hines Energy Complex Recharge-Recovery	265,568	5,455					533,523	FL Power SWFWMD	1.0
d) Natural Treatment of Wastewater/Stormwater	335,742	5,455					669,697	FIPR SWFWMD	
e) Section 21 Wellfield Rehydration Pilot Project	427,992	3,397					1,695,889	TBW SWFWMD	TBD
f) Starkey Wellfield Rehydration Pilot Project	251,228	4,074					502,026	TBW SWFWMD	TBD
g) Starkey Ecosystem Enhancement Project	433,722	354,835	1,650,000	1,650,000			8,163,557	TBW SWFWMD	TBD
2) Agricultural Water Supply/Environmental Restoration Projects									
a) Shell/Joshua/Prairie Creeks Well Rehabilitation	749,849	288,171					1,038,020	SWFWMD	TBD
b) Shell/Joshua/Prairie (FARMS Program)	1,250,000	1,917,271					3,267,271	FDACS SWFWMD	0.85
3) Restoration of Minimum Flows to the Upper Peace River									
a) Up. Peace River Min Flow Enhancement Feas. Study	374,366	7,162	4,000,000				4,381,528	SWFWMD	3.0
b) Lake Hancock Lake Level Modification	223,624	742,518					966,142	SWFWMD	4.0
c) Lake Hancock Outfall Structure P-11 Modification	2,500,000		2,500,000				5,000,000	SWFWMD	N/A
d) Lake Hancock Outfall Wetland Treatment System	6,717,723	6,769,128					13,486,851	SWFWMD	N/A

Project	Total Prior District Funding (\$)	FY2004 District Cost (\$)	FY2005 District Cost (\$)	FY2006 District Cost (\$)	FY2007 District Cost (\$)	FY2008 District Cost (\$)	Total Cost District + Cooperator	Funding Source	Water Quantity to be Developed (mgd)
e) Hydraulic Reconnect of Non-mand. Phos. Lands	43,742	47,489					91,231	SWFWMD	5.0
f) Effect of Karst Devel. on Peace River Flow	195,000	139,671	50,000				759,671	USGS SWFWMD	N/A
g) Eval. of WRD Proj. in Upper Peace Basin		188,419					188,419	SWFWMD	TBD
4) Tampa Bay Regional Reclaimed Water Project									
a) Tampa Bay Regional Reclaimed Water and Downstream Augmentation Project	5,717,274	5,214,623	TBD	TBD	TBD	TBD	213,000,000	City of Tampa, Pasco Co., Hills. Co., Tampa Bay Water, SWFWMD, and Fed. Govt.	26.0 (offset for res. Irrig., natural systems hydrat., and augment. of Hills. River for MFLs and Tampa Bypass Cnl. for potable exchange.
Pasco Co. Land O' Lakes Reg. Pumping & Storage	Now part of the Tampa Bay Regional Reclaimed Water and Downstream Augmentation Project								
Pasco Co. New River Reg. Trans. Main Interconnect.									
City of Tampa No. Tampa Pipeline Design & Constr.									
b) Largo/Clearwater/Pasco ASR Interconnect	1,328,059	1,179,093	1,426,683	1,176,709			10,067,144	Largo, Clearwater, SWFWMD	1.8 (potable water offset)
Total	21,120,147	16,913,035	9,626,683	2,826,709	TBD	TBD	264,374,733		41.65

Source: SWFWMD FY2004 Summarized Programmatic Activities Report

Note: The Upper Myakka-Flatford Swamp Alternative Supply Development Project and the Falkner Flatford Swamp Surface Water Withdrawal Project, included in Table 2 in the 2002 Work Program, have been completed and are, therefore, not included in the Table above.

1) Alternative Water Supply Research/Pilot Projects

The following projects are research and/or pilot projects designed to further the development of the innovative alternative water sources described in the RWSP. These projects include: 1) studies to determine the safety of partially treated ASR, 2) research to develop methods to improve the water quality of ASR systems, 3) a pilot-scale investigation of a wetland treatment system to treat storm water and reclaimed water for an ASR system, 4) two pilot-scale projects to determine the feasibility of rehydrating wetlands on wellfields with reclaimed water, and 5) a project to rehydrate wellfield wetlands with excess flows from nearby rivers. Although these projects are, for the most part, relatively small scale, their successful completion may lead to their development as major sources of water supply for the future.

a) Fate of Microorganisms in the Floridan Aquifer

Background

This study is documenting the fate of microorganisms during the storage phase of ASR, and identifying the factors affecting the fate of these microorganisms. This information will be useful in establishing a "zone of discharge" in the aquifer for injected water containing low levels of microorganisms. The project is being performed by the University of South Florida (USF) and a consultant under separate agreements. USF is performing bench scale laboratory analysis that will determine the mortality of microorganisms in a variety of water quality conditions. The consultant is performing field investigations at one, possibly two, sites where microorganisms are entering the aquifer through natural features such as sinkholes or wells.

Linkage to the Regional Water Supply Plan

A major alternative source identified in the District's RWSP is the harvesting of a portion of the tremendous volume of water flowing in the District's major rivers during the wet-season. The RWSP identifies a number of ways to utilize this water including aquifer storage and recovery and aquifer recharge. Because the volume of water that could be captured is so large and the window for capturing it is relatively short (June through September), storing or recharging the water in the Floridan aquifer would be greatly facilitated and much more cost effective if treatment could be limited to mechanical filtration. The aquifer could be relied on to treat the microorganism content through dilution, dispersion, or simple die off of the organisms due to the harsh conditions in the subsurface environment. The District realizes the controversial nature of the proposal and is committed to developing the sound scientific data to prove the safety of such systems. This project is an integral part of the effort to generate the necessary data. The concept for this project is referenced in the RWSP on page 124, last paragraph.

Status

The Florida Department of Environmental Protection (FDEP) has recognized the project as being one of the initial studies needed for understanding the issue. The Technical Advisory Committee (TAC) for this project met in May 2001 and in August 2002 to discuss results and the procedures for the remaining bench scale study. USF is running test beaker studies to fine-tune their methodology prior to running tests with *Cryptosporidium* and *Giardia lamblia*. Dr. Rose and her staff presented updated preliminary results from USF's early beaker studies at the ASR Conference in Orlando on January 7, 2002. The second TAC meeting was held in August 2002 and USF and CH2MHill discussed the current progress and options for additional studies. A second

round of ground-water samples was collected by USF in October and November 2002. The final runs for Cryptosporidium and Giardia will be started in March 2003. The Phase One Laboratory study was completed in October of 2003. A significant setback in support for a field demonstration project has put this part of the project on indefinite hold. If the field portion of the project moves forward, it will most likely be after the lab results and other studies such as the drainage well evaluation that St. Johns River Water Management District is performing in Orlando. A contract amendment to extend the completion date by one year and to address the issue of Dr. Rose moving to the University of Michigan has been executed. USF will retain the project management responsibilities but will subcontract to the University of Michigan so that Dr. Rose can remain the lead investigator.

Future Actions

Research being performed in Australia will be followed closely and information will be exchanged to further everyone's understanding of this issue.

b) Evaluation of Aquifer Storage and Recovery Systems

Background

This project involves the evaluation of the interactions between water that is injected into the Floridan aquifer and the rocks that make up the Floridan aquifer during the storage phase of ASR operations. Differences in water quality between source waters and aquifer water have resulted in difficulties in the operation of ASR systems. These difficulties range from poor recovery to mobilization of constituents in the aquifer that could contribute to the recovery of a lower quality of water. This effort is evaluating and identifying potential effects of storing treated water in the Floridan aquifer. Water quality data is being collected from source waters and aquifer storage zones to characterize differences that exist. In addition, core samples of aquifer storage zones are being analyzed to determine aquifer matrix composition. Geochemical modeling will then be conducted to determine what happens when these waters are mixed and come in contact with the aquifer matrix. Results of this effort will be used in the siting, design, operation, and maintenance of future ASR systems.

Linkage to the Regional Water Supply Plan

One of the principal components of the surface-water and reclaimed water alternative source projects discussed in the RWSP is storage because the availability of these sources is seasonally dependent. The success of ASR will be critical to the future development of surface-water and reclaimed water sources and will affect the District's ability to meet future demands. This project will further the development of ASR systems by addressing the problem of mobilization of constituents in the aquifer that contribute to the recovery of a lower quality of water. Although not specifically referred to in the RWSP, these types of projects are critical components of the District's strategy to develop ASR on a large scale.

Status

A monitor well network consisting of 20 wells with discrete intervals open to the Suwannee Limestone was established in January of 2002 in the District's SWUCA. The first round of water samples from the network was collected in May of 2002. Analysis of water samples by the USF and District labs was completed by late June 2002. The second sampling of the monitor well network was completed in late October 2002. Analysis of these samples and arsenic speciation and total arsenic analysis was completed in February 2003. The analysis shows that the arsenic concentration in water samples obtained from the Floridan aquifer monitor wells is extremely minute (less than 100 parts per trillion). Trips were made to the Florida Geological Survey core

lab in Tallahassee to collect several dozen feet of core obtained during construction of the wells that were included in the monitoring network. A representative number of core samples were analyzed using an electron microscope and a microprobe at Florida International University in Miami. Over 300 samples taken from the cores were analyzed for arsenic concentrations. The various methods used to analyze the samples appear to indicate that the source of arsenic in the core samples is minute pyrite crystals in the limestone. Water quality samples collected during the third sampling of the monitor well network were analyzed for arsenic in August. Analysis for all other parameters was completed by the District's in-house and overflow labs in August. Water quality data from cycle testing of the City of Tampa's ASR wells was collected in August. These data will be used for the geochemical modeling that will be occurring over the next year.

Future Actions

Once the analysis of additional water samples is completed in October 2003, the water quality data and core data will be modeled to determine under what geochemical conditions the arsenic is released from the rock of the Floridan aquifer and what can be done in terms of pretreatment to prevent the release of arsenic. In 2004, the same type of study will be initiated to investigate the contribution of arsenic from the Hawthorn Group.

c) Hines Energy Complex Recharge/Recovery Project
d) Natural Treatment of Wastewater/Stormwater project

Background

The objective of the Hines Energy Complex Recharge/Recovery Project is to design, construct and test a recharge/recovery well system. The project is being conducted at Florida Power Corporation's (FPC) Hines Energy Complex on previously mined phosphate land situated southwest of the city of Bartow in Polk County. An on-site cooling pond will be used as the source of injection water. Water in the cooling pond is derived from the on-site capture of storm water and reclaimed water from the city of Bartow. Prior to injection, the water will be treated to potable standards using wetlands treatment and sand filtration systems that have been constructed as part of the Natural Treatment of Wastewater/Stormwater project. This project, conducted in cooperation with the Florida Institute of Phosphate Research (FIPR), began in 1999 and is intended to enhance the water treatment aspects of the Hines Energy Complex Recharge/Recovery Project. The project is investigating the feasibility of using wetlands on waste clay settling areas to treat secondary treated wastewater and storm water to drinking water standards. Further water treatment will be achieved by use of sand tailing basins to provide filtration. Following treatment to drinking water standards, the water will be injected into the Upper Floridan aquifer and withdrawn to supplement the cooling pond when there is insufficient water in the pond for power generation. If these projects are successful, FPC will expand the water quality treatment and recharge well systems to offset the effects of up to 12.5 mgd of future ground-water withdrawals.

Linkage to the Regional Water Supply Plan

The treatment of wastewater and storm water to drinking water standards using wetlands treatment systems has tremendous potential to cost-effectively treat large volumes of water for storage in ASR systems or for aquifer recharge. This project is specifically referred to in the RWSP on page 130, second row from the bottom in Table IVC-6.

Status

The first year work effort included field investigations and design of the sand filtration system. Construction of the treatment system was completed in February 2001 and operational testing of the entire system was conducted during March 2001. Modifications to the Plant Island stormwater ditch, the third source of water (rainfall capture and reclaimed water are the other two sources), were necessary due to poor water conveyance. Three pump motors (effluent, wetland and filter basin pumps)

burned out during spring 2001 as a result of faulty wiring and power outages. The problem was corrected. Water from the on-site cooling pond has been delivered to the treatment wetlands at a rate of about 165 gpm (238,000 gpd), pumped to the sand filtration basin, and then pumped back into the cooling pond. An ongoing, weekly schedule of monitoring and water quality sampling was initiated on May 3, 2001. Cleansing of the drainage system was initiated in March and completed June 3, 2002. Rewiring of electrical systems and pump repairs also occurred during June 2002. Water level controllers were installed during July and full scale operation of the treatment system began on July 24, 2002. The water quality sampling program was re-initiated on August 7, 2002. Initiation of construction of the recharge well was delayed because of the need to test the treatment system and because FPC was required to modify their site certification in order for them to use the recharge/recovery well to satisfy their water needs. In February 2002, FPC obtained a "Draft" permit from the FDEP to construct one class V, group 8, exploratory well to obtain information to determine the feasibility of artificial recharge to the Upper Floridan aquifer at the site. Following the public hearing process, FDEP issued a permit for construction exploration of a test well at the site on July 29, 2002. Florida Power Corporation has contracted with a drilling firm and construction of the ASR well will begin in September 2003.

Future Actions

Two full years of water quality data indicating that the wetland treatment system is capable of producing water that meets drinking water standards must be generated before the project can move forward. This is projected to be completed in the latter part of 2003.

e) Section 21 Wellfield Rehydration Pilot Project

Background

The objective of this project is to investigate the feasibility of using storm water and reclaimed water to rehydrate stressed and impacted wetlands on the Section 21 wellfield in Hillsborough County, and to determine the effects of this type of rehydration on water levels, water quality and wetland health. A key component of the pilot project is the risk assessment (RA). The purpose of the RA is to measure the probability and level of possible public health consequences associated with rehydrating surface features on the wellfield with surface water and/or reclaimed water. The RA is focusing mainly on the potential risks associated with chemical and microbiological contaminants found in the source waters through the wellfield's surface and ground-water systems. Depending on the results of the RA and the determination of the risks involved, Tampa Bay Water, regulatory agencies, and other stakeholders will decide whether to go forward with the rehydration project. If the project proves to be feasible, the same approach can be taken at other wellfields to rehydrate wetlands that have been impacted by ground-water withdrawals.

Linkage to the Regional Water Supply Plan

One of the goals for the development of reclaimed water as an alternative water source, as stated in the District's RWSP, is to maximize the utilization of reclaimed water by making full use of excess wet-weather flows. The District is working to achieve this goal by storing the excess reclaimed water in ASR systems for recovery and use in the dry season. Additional wet-weather flows will be used for the recovery of natural systems and recharge of the aquifer. This project involves the use of reclaimed water to rehydrate natural systems that have been stressed through excessive ground-water withdrawals. This project concept is referred to in the RWSP on page 164, bullet #5.

Status

A fourth amendment to the contract between the District and Tampa Bay Water to modify the project scope of work and budget was approved by the NW Hillsborough and Pinellas-Anclote River Basin Boards in February 2003. The amendment was approved by the Tampa Bay Water Board in March. Tampa Bay Water continues to perform rehabilitation work on the production wells at the Section 21 wellfield. This project has been essentially stalled until this rehabilitation work is completed. It is expected to take a year to complete. The consultant is continuing work on the development a risk assessment/water quality decision process that will help to streamline future projects

that may require similar treatment. The consultant submitted a draft document in late March. District staff provided comments on the document.

Future Actions

The risk assessment should be completed in 2005. Once completed, the District and Tampa Bay Water will use the results of the risk assessment to decide whether to proceed with design and construction of the project.

f) Starkey Wellfield Rehydration Pilot Project

Background

The purpose of this project is to investigate the use of reclaimed water on the Starkey Wellfield in Pasco County to recharge the surficial aquifer which in turn will provide recharge to the underlying Floridan Aquifer. The water will be applied with an above-ground sprinkler system. A corollary benefit of recharging the surficial aquifer is that water may be available to rehydrate nearby wetlands. A portion of the sprinkler system has been installed and connected to Pasco County's reclaimed water transmission line and five surficial aquifer and three Upper Floridan aquifer monitor wells have been installed. Data collection has begun on background hydrologic, chemical, and biologic conditions.

Linkage to the Regional Water Supply Plan

One of the goals for the development of reclaimed water as an alternative water source, as stated in the District's RWSP, is to maximize the utilization of reclaimed water by making full use of excess wet-weather flows. The District is working to achieve this goal by storing the excess reclaimed water in ASR systems for recovery and use in the dry season. Additional wet-weather flows will be used for the recovery of natural systems and recharge of the aquifer. This project involves the use of reclaimed water to rehydrate natural systems that have been stressed through excessive ground-water withdrawals. This project concept is referred to in the RWSP on page 164, bullet #5.

Status

The existing project agreement expired December 31, 2002. A second amendment requesting a no-cost time extension has been approved by the appropriate Basin Boards. The amendment will extend the contract until September 30, 2007. This provides time for additional sampling and analyses prior to the application of reclaimed water to the wellfield. Once the final decision has been made to proceed, the actual study will take approximately three more years. It is anticipated that the decision whether or not to proceed will take place in 2003.

Future Actions

If the decision is made to proceed with the project, final construction of the system will probably be completed during 2005.

g) Starkey Ecosystem Enhancement Project

Background

This is a pilot project that will examine the feasibility of diverting excess flows of the Anclote and Pithlachascotee Rivers to rehydrate wetlands on the Starkey Wellfield in Pasco County. The project has the potential to directly rehydrate up to 400 acres of cypress, marsh, and cypress marsh wetlands and will improve natural systems and wildlife habitat on the Starkey property. This is a three-year project that will be implemented during FY2002 through FY2004.

Linkage to the Regional Water Supply Plan

This project is another in a series of projects designed to harvest a portion of the wet-season flow of a river. In this case, the harvested water will be used to rehydrate wetlands that have been stressed by ground-water withdrawals. This project is specifically referred to in the RWSP on page 138, Table IVD-1, row 1. A full-page description of the project is on page 148.

Status

The project consultant is revising the final feasibility report per District and Tampa Bay Water (TBW) staff comments. The final report is expected in late October of 2003. A workshop to discuss the results of the phase 1 feasibility study for TBW member governments and District staff was held in late September of 2003.

Future Actions

The TBW Board will be holding workshops from October through December 2003 to decide on their priority water supply development projects to supply needs from 2008-2015. This project has received a priority ranking by TBW staff. In December 2003, the TBW Board will decide whether to proceed with phase 2 and final construction of the project.

2) Agricultural Water Supply/Environmental Restoration Projects

These projects employ many of the agricultural water conservation strategies described in the RWSP to reduce ground-water withdrawals by increasing the water use efficiency of agricultural operations. The projects have the added benefit of reducing agricultural impacts to surface-water features. The projects are public/private partnerships in that the District provides financial incentives to farmers to increase the water use efficiency of their operations. While these projects are not specifically described in the RWSP, they make use of the agricultural conservation strategies described in the RWSP on pages 95-100 and 207-220.

a) Shell/Joshua/Prairie Creeks Well Rehabilitation

Background

The objective of this project is to rehabilitate agricultural wells that are producing highly mineralized water that is reducing the quality of water in the Shell Creek Reservoir in Charlotte County. Back-plugging the wells to a recommended well depth helps sustain surface-water resources for public supplies and assists in maintaining ground-water resources for the agricultural community. Back-plugging activities to improve water quality have been extremely successful to date. Initial results have shown an average of 68 percent improvement in water quality in the wells that have been back plugged.

Linkage to the Regional Water Supply Plan

This project is related to the District's QWIP which is described in the RWSP on page 223. Although the project is related to QWIP, it has a separate budget which is listed in Table 2. In addition, this project will help the District reach the agricultural water conservation goal for the SWUCA (stated in the RWSP on page 75) of 36.8 mgd by the year 2020.

Status

The total number of back-plugged wells remains at 29. This equates to two wells in the Shell Creek Watershed, 10 wells in the Prairie Creek Watershed, and 17 wells in the Joshua Creek Watershed. A notable improvement in water quality has been achieved in the back-plugged wells with an approximate 53 percent improvement in total dissolved solids (TDS) and an approximate 72 percent improvement in chloride concentration. Well yields have been reduced in the back-plugged wells by an average of approximately 30 percent. Activities have recently picked up and staff expect to back-plug four wells prior to the end of November 2003. Three of the wells are in the Prairie Creek watershed, the other is in the Joshua Creek watershed.

Future Actions

It is anticipated that four additional wells in the Joshua Creek watershed will be back-plugged during the spring of 2004. Back-plugging efforts are expected to increase as more sampling is performed and growers are able to pull pumps during the 2004 rainy season. Water quality sampling to identify problem wells will continue through 2004.

b) Shell/Joshua/Prairie Creeks Water Conservation (FARMS Program)

Background

The Facilitating Agricultural Resource Management Systems Initiative (FARMS), has been developed in cooperation with the Florida Department of Agriculture and Consumer Services (FDACS) to achieve water quality improvements and reduce water use in the region. The purpose of the FARMS Initiative is to implement agricultural best management practices within Water Use Caution Areas (WUCAs) that will provide resource benefits that include water quality improvement; reduced Upper Floridian aquifer withdrawals; and/or conserve, restore, or augment the area's water resources and ecology. The District has obtained a \$1,250,000 state grant that will aid in improving the water use efficiency of irrigation systems in these watersheds.

Linkage to the Regional Water Supply Plan

FARMS is intended to assist with the implementation of the RWSP in that it is a public/private partnership that will help farmers improve the efficiency of their irrigation systems which will reduce the use of ground water in the District's SWUCA. In addition, this project will help the District reach the agricultural water conservation goal for the SWUCA (stated in the RWSP on page 75) of 36.8 mgd by the year 2020.

Status

To date, the Peace River Basin Board and the District's Governing Board have approved three FARMS projects in SPJC. Contracts for two projects, Blue Heron Groves and TRB Groves, have been approved and signed by all parties. On June 17, 2003, the Blue Heron Groves project was deemed complete and operational. Funding for this project came entirely from FDACS as agreed to by the District. The TRB project is ongoing and is expected to be completed this fall. The final approved project is with American Citrus Products, which is still in final contractual negotiations. All three projects are in the Shell Creek watershed. Many more applicants are interested and staff is reviewing a project in the Joshua Creek watershed and the Prairie Creek watershed.

Future Actions

Additional projects are currently being formulated and are expected to be presented at future Board meetings. The FARMS program is expected to be made available throughout the SWUCA and if approved, the program will have a substantial increase in budgeted dollars.

3) Restoration of Minimum Flows to the Upper Peace River

An important chapter of the RWSP outlines the District's strategy for establishing minimum flows and levels for major water resources. The District is currently setting minimum flows for the Upper Peace River. Surface-water drainage alterations, reduction in surface storage, long-term rainfall patterns and induced recharge due to ground-water withdrawals have all contributed to a reduction in low flows in the upper river. A requirement of minimum flow establishment is the development of a recovery strategy when actual levels are below or are anticipated to fall below established minimums. It is anticipated that actual flows will be below the minimum flows being proposed for the Upper Peace River. These projects are key portions of the recovery strategy to restore minimum flows to the Upper Peace River.

a) Upper Peace River Minimum Flow Enhancement Feasibility Study

Background

This project involves a feasibility study to evaluate the potential of utilizing an abandoned phosphate clay settling area for storage and ultimate release back to the river. The site chosen for the study is a 430-acre parcel located just east of the Peace River and immediately south of County Road 640 in Polk County. It is within the Upper Peace River watershed, adjacent to state-owned lands, and is a reclaimed waste clay pond area with a consolidated clay bottom. The study will include a water budget for the proposed reservoir to determine the amount of water that can be captured and retained from the reservoir's contributing area, and/or diverted from the Peace River during periods of high flows. Rate and duration of flows to be discharged from the reservoir into the Peace River during low flows will also be determined. Based on the water budget, a reservoir design will be completed that will include height recommendations for embankments.

Linkage to the Regional Water Supply Plan

This project is not specifically listed in the RWSP because the plan was completed in 2001 and the District has not yet completed the process of establishing a minimum flow for the upper Peace River and adopting a recovery strategy. However, the actual flow of the upper Peace River is below the District's proposed minimum flow and therefore, in anticipation of the adoption of the proposed minimum flow, the District has proposed a recovery strategy and is implementing projects in support of the proposed recovery strategy. This type of recovery project is referred to in a general sense in the RWSP on page 32, Section 4, subheading 1.0, Strategy/Goals. The last sentence of the first paragraph states in part "... a number of management tools are available to restore the water body/system to meet MFLs, including implementing structural controls and/or augmentation systems to raise levels or flows in water bodies ... "

Status

The appraisal of the value of the reservoir site has been completed. Staff would like to make the land purchase contingent upon obtaining a water use permit (WUP) for withdrawing water from the Peace River. In August 2003, staff presented a proposed purchase agreement to the owner that included the WUP contingency. A representative for the property owner notified staff on August 28, 2003, that the owner was rejecting the offer due to the proposed purchase amount. At their August 2003 meetings, the Manasota, Alafia, and Peace River Basin Boards and Governing Board approved the encumbrance of the FY2003 funds (\$360,000) without a contract.

Future Actions

Once the purchase of the land is successfully concluded, the design and permitting phase of the project will commence.

b) Lake Hancock Lake Level Modification

Background

Part of the proposed recovery strategy for the Upper Peace River is to restore storage in Lake Hancock and release some of the water during the dry season to help meet the flow requirements. Historically, Lake Hancock fluctuated more than a foot higher than it has during the past several decades. This lowering was due to the dredging of the outfall canal in the early part of the last century. This project proposes to evaluate the impact of modifying or replacing the District's outfall structure so that water levels can be maintained at historical levels. The evaluation will utilize the regional flood study model recently developed in cooperation with Polk County for the Saddle Creek watershed

Linkage to the Regional Water Supply Plan

This project is not specifically listed in the RWSP because the plan was completed in 2001 and the District has not yet completed the process of establishing a minimum flow for the upper Peace River and adopting a recovery strategy. However, the actual flow of the upper Peace River is below the District's proposed minimum flow and therefore, in anticipation of the adoption of the proposed minimum flow, the District has proposed a recovery strategy and is implementing projects in support of the proposed recovery strategy. This type of recovery project is referred to in a general sense in the RWSP on page 32, Section 4, subheading 1.0, Strategy/Goals. The last sentence of the first paragraph states in part "... a number of management tools are available to restore the system/system to meet MFLs, including implementing structural controls and/or augmentation systems to raise levels or flows in water bodies ... "

Status

A Request For Proposals (RFP) was developed to select a consultant to perform a Watershed Management Program for the Lake Hancock Lake Level Modification project. The consulting firm assigned to perform Step (1) of the Project, has begun watershed information compilation to evaluate the impacts associated with raising the Hancock levels. District staff will continue to meet with Polk County and other agencies to discuss inter-agency coordination for implementing the Lake Hancock Lake Level Modification. The consultant has completed the update of the Digital Terrain Model for the area adjacent to Lake Hancock and has completed the impact analysis of raising lake levels on the Old Florida Plantation (OFP) Property. The District has purchased the 3,536 acres of the OFP property as part of the mitigation for projected impacts. The consultant is currently developing a watershed model to project floodplain impacts

resulting from raising the lake.

Future Actions

Once the impacts of raising the structure are determined, a plan of implementation will be developed which could include the purchase of any additional lands affected by any alteration. The project is expected to be completed in early 2004.

c) Lake Hancock Outfall Structure P-11 Modification

Background

This project proposes to restore storage in Lake Hancock by modifying or replacing the District's outfall structure so that water levels can be maintained at historic levels. This project will be coordinated with other Lake Hancock restoration efforts. In particular, there will be a supporting hydrologic analysis to determine which properties may need to be acquired due to risk of flood.

Linkage to the Regional Water Supply Plan

This project is not specifically listed in the RWSP because the plan was completed in 2001 and the District has not yet completed the process of establishing a minimum flow for the upper Peace River and adopting a recovery strategy. However, the actual flow of the upper Peace River is below the District's proposed minimum flow and therefore, in anticipation of the adoption of the proposed minimum flow, the District has proposed a recovery strategy and is implementing projects in support of the proposed recovery strategy. This type of recovery project is referred to in a general sense in the RWSP on page 32, Section 4, subheading 1.0, Strategy/Goals. The last sentence of the first paragraph states in part "... a number of management tools are available to restore the system/system to meet MFLs, including implementing structural controls and/or augmentation systems to raise levels or flows in water bodies ... "

Status

This project cannot go forward until the previous project, the Lake Hancock Lake Level Modification Project, is completed.

Future Actions

None at this time.

d) Lake Hancock Outfall Wetland Treatment System

Background

This project will investigate the development of a wetland treatment system to improve water quality leaving the lake. The location has yet to be determined, but it may be at the southern end of the lake, immediately above the outfall structure, or downstream of the structure, or a combination of both. A plan utilizing a treatment system below the structure (which is highly probable) will necessitate the purchase of lands for construction of the treatment wetland, which may be several hundred acres in size. Water quality leaving Lake Hancock has been documented as a major source of poor water quality in the Upper Peace River. There is evidence that this poor water quality affects the River all the way down to Charlotte Harbor and is a concern of public water supplies from the river. Funding for this project is to be from Florida Forever Trust funds set aside for water resource development projects such as this.

Linkage to the Regional Water Supply Plan

This project is not specifically listed in the RWSP because the plan was completed in 2001 and the District has not yet completed the process of establishing a minimum flow for the upper Peace River and adopting a recovery strategy. However, the actual flow of the upper Peace River is below the District's proposed minimum flow and therefore, in anticipation of the adoption of the proposed minimum flow, the District has proposed a recovery strategy and is implementing projects in support of the proposed recovery strategy. This type of recovery project is referred to in a general sense in the RWSP on page 32, Section 4, subheading 1.0, Strategy/Goals. The last sentence of the first paragraph states in part "... a number of management tools are available to restore the system/system to meet MFLs, including implementing structural controls and/or augmentation systems to raise levels or flows in water bodies ... "

Status

The process to secure an engineering consultant for the feasibility study, design and permitting of the outfall treatment project was completed July 22, 2003. Staff is negotiating the consultant agreement. The Old Florida Plantation property, approximately 3,536 acres located along the eastern and southern shoreline of Lake Hancock, has been acquired. Portions of the land will be utilized for the outfall treatment project. A meeting was held on June 26, 2003, between Bartow Regulatory staff and Resource Management staff for the Lake Hancock projects to provide an overview of the projects and to gain insight into permitting issues that may be associated with the projects. Such coordination will be conducted periodically during

design. The schedule for completing this project will be updated once the consultant agreement is finalized.

Future Action

District land acquisition staff continue to negotiate with several property owners to obtain the lands necessary for the project.

e) Hydraulic Reconnection of Non-Mandatory Phosphate Lands

Background

This project will investigate the restoration of non-mandatory phosphate lands, which are lands mined prior to the mandatory reclamation rules (pre-1975). It is estimated that there are over 30 thousand acres of these lands, which are comprised of sand tailing areas, clay tailings, waste clay settling areas and open mine cuts. The concept is to explore whether these areas can be reclaimed in such a manner as to hold and then release stored water during periods of low flows. The District will work with the Bureau of Mine Reclamation and will seek to utilize non-mandatory lands restoration funds.

Linkage to the Regional Water Supply Plan

This project is not specifically listed in the RWSP because the plan was completed in 2001 and the District has not yet completed the process of establishing a minimum flow for the upper Peace River and adopting a recovery strategy. However, the actual flow of the upper Peace River is below the District's proposed minimum flow and therefore, in anticipation of the adoption of the proposed minimum flow, the District has proposed a recovery strategy and is implementing projects in support of the proposed recovery strategy. This type of recovery project is referred to in a general sense in the RWSP on page 32, Section 4, subheading 1.0, Strategy/Goals. The last sentence of the first paragraph states in part "... a number of management tools are available to restore the system/system to meet MFLs, including implementing structural controls and/or augmentation systems to raise levels or flows in water bodies ... "

Status

Staff issued a purchase order to a consultant on June 17, 2003, to assemble GIS coverages for the initial base mapping. The work to identify parcels meeting the defined selection criteria can now begin. This work will be completed by the summer of 2004.

Future Actions

Once the non-mandatory mined lands available for restoration have been identified, the next step in the process will be to acquire them for eventual restoration.

f) Effect of Karst Development on Peace River Flow

Background

This project is part of the Recovery Strategy for the Upper Peace River. It is a cooperative effort between the USGS and the District to assess the hydraulic connection between the river and underlying aquifers, characterize and map karst features within or adjacent to the river bed, and determine the amount of flow loss to the karst openings along the upper part of the Peace River from Bartow to Ft. Meade. Long-term decline in Upper Floridan aquifer water levels has reversed the hydraulic gradient between the river and the underlying aquifers which has occasionally resulted in loss of perennial flow along the river between Bartow and Homeland. Understanding the extent, timing, and magnitude of flow loss to the underlying aquifers is the first step in the process of developing water resource development projects that could eventually augment low flow conditions along the upper reach of the river. Major elements of the study include: 1) conducting an analysis of historical hydrogeologic and land-use information in the basin, 2) identifying, locating, and characterizing karst features in the river bed and flood plain, 3) quantifying the flow losses to the karst openings and gains from mining outfalls, and 4) assessing the hydraulic connection of the river to the underlying aquifers. Two new stream gaging stations will be installed on the river by the USGS between Bartow and Ft. Meade. The District will provide and supervise drilling operations at four sites near the upper part of the Peace River. Drilling operations will involve collection of data on geology, hydraulic characteristics, and degree of connection between the riverbed and underlying aquifers. Monitor wells will also be installed in the surficial aquifer, intermediate aquifer system, and the Upper Floridan aquifer at each site. The project is four years in duration and will be completed by October 2005. An interim project report will be provided by the USGS that includes the location of karst features and preliminary estimates of flow loss to the underlying aquifers at the end of FY2003. A final report will present the findings of the study at the end of FY2005.

Linkage to the Regional Water Supply Plan

This project is not specifically referenced in the Regional Water Supply Plan. However, it is an integral component of the recovery strategy for the Upper Peace River.

Status

District staff met with a representative for the Clear Springs Mine property on August 7, 2003, to discuss the project and to obtain access rights to three drilling sites. During the meeting, the representative verbally agreed to grant access to the sites. Staff received

a draft copy of the interim report from the USGS in July 2003 and provided comments to the USGS project manager. The final interim report is due on September 30, 2003. The Bartow Wastewater Treatment Plant drilling site has been surveyed and is awaiting site preparation.

Future Actions

Once the easements are officially obtained, monitor well construction will commence. It is hoped that drilling can be completed by mid 2004.

g) Evaluation of Water Resource Development Projects in the Upper Peace River Basin

Background

The purpose of this project is to identify and evaluate potential water resource development projects in the upper Peace Basin that would help restore low flows to the upper Peace River. In 2002, the District completed the technical work necessary for establishing minimum flows for the upper Peace River and the first draft of the Peace River Cumulative Impacts Analysis Report. The upper Peace River watershed has been heavily impacted by mining, development activities, and withdrawals. Currently, the proposed minimum "low" flows are not being met at the Bartow and Ft. Meade gauging sites. A major concept included in the Southern Water Use Caution Area (SWUCA) Recovery Strategy is to develop projects that could store wet season rainfall and reconnect mined areas of the watershed to the main stem of the river. It is anticipated that these projects can be used to help restore low flows in the river while creating opportunities for water supply development. The consultant contracted for this effort will work with District staff and other interested parties to identify potential options for water resource development and conduct feasibility analyses to determine the potential for building the projects. Examples of projects that could be evaluated include the use of mined areas to store wet season flows.

Linkage to the Regional Water Supply Plan

This project is not specifically referenced in the Regional Water Supply Plan. However, it is an integral component of the recovery strategy for the Upper Peace River.

Status

A request for proposals is being developed as part of the process to select a consultant to manage the project.

Future Actions

Once a consultant is selected, actual work on the project will begin.

4) Tampa Bay Regional Reclaimed Water Project

The District's RWSP provides a detailed discussion of the role of reclaimed water in meeting 2020 water demand. In keeping with the RWSP, the District has developed a strategy to optimize the use of reclaimed water in the Tampa Bay area by creating a regional reclaimed water system. The water offset from the transmission, distribution, and storage systems supported by the following projects will result in a significant ground-water demand reduction from local irrigation wells and potable water supplied by local municipalities and Tampa Bay Water. The projects will also allow treated wastewater utilized in the highly urbanized coastal areas to be returned inland to the area of origin, allowing for artificial recharging of the aquifer, and hydration of water dependent natural systems. Finally, reclaimed water will be used to meet the minimum flow requirements for the downstream portion of the bypass canal, which will allow Tampa Bay Water to exchange reclaimed water gallon for gallon for potable water.

This project is not discussed in the RWSP because the concept was not proposed until approximately six months after the plan was adopted by the District's Governing Board and the concept has continued to evolve through the present. However, the goal of the project, which is to maximize utilization and offset of the reclaimed water available in the Tampa Bay area, is discussed at length in the RWSP. Furthermore, a number of the major components of the regional system are specifically identified in the RWSP.

a) Tampa Bay Regional Reclaimed Water and Downstream Augmentation Project

Background

This project represents the collaboration of the District, four water suppliers, and potentially the federal government to maximize the use of reclaimed water resources within the Tampa Bay area. The project will help the partners reach mutual goals of (1) reducing the use of traditional water supplies for irrigation and other purposes, (2) increasing the beneficial use of wet-weather reclaimed water flows, rather than continue the practice of discharging them to tide or deep wells, (3) helping to restore the natural systems in the Hillsborough River Watershed, and providing potable water through the use of reclaimed water for downstream augmentation. The District's partnership with the City of Tampa, Hillsborough County, Pasco County, and Tampa Bay Water will ultimately offset the use of potable water, provide for natural system restoration, and provide reclaimed water below the dam on the lower Hillsborough River to meet minimum flows. This will allow the City of Tampa to maximize their water withdrawals from the upper River for potable purposes. In addition, the project will provide for additional potable water development from the Tampa Bypass Canal through the augmentation of the lower reaches of the canal with reclaimed water.

In its entirety, the project will consist of the design, permitting and construction of a regional reclaimed water system expected by 2010 to supply nearly 30,000 residential, 10 industrial, more than 250 commercial and 10 golf course customers. A major emphasis of this regional project is to deliver reclaimed water to the area of its origin as part of a comprehensive watershed management approach. Therefore, a significant amount of reclaimed water will be delivered to the wetland and/or upland systems of Pasco County during wet weather to restore natural systems previously damaged from the cumulative effects of over pumping of ground water and drought. Wet weather flows may also be delivered to Hillsborough County for storage and/or aquifer recharge. Additional offsets and restoration benefits are anticipated beyond 2010.

The primary source of reclaimed water for these projects is the City of Tampa's Howard F. Curren Advanced Wastewater Treatment Plant (WWTP), which has an annual average reclaimed water flow of approximately 60 mgd. The Tampa Bay Estuary Program estimates that removing the reclaimed water discharge to Tampa Bay from Tampa's WWTP could reduce nitrogen loading by 175 tons annually, or 3.5 percent. The overall project includes a number of sub-projects that will be designed, permitted and constructed through 2012.

The overall project is expected to delay the need for additional water supply infrastructure for Tampa Bay Water. The planning level cost for the entire regional project is \$213 million.

Linkage to the Regional Water Supply Plan

As a major component of the Tampa Bay Regional Reclaimed Water Project, this project has a number of elements that are generally discussed in the RWSP on page 164 (bullet #10 - transmission, bullet # 8 - streamflow augmentation, bullet #9 – system expansion) and specifically referenced on page 167, Table IVD-4, project #2, and #11.

Status

The agreement between the District and City of Tampa for the design of the entire North Tampa Pipeline and construction of Phase I of the pipeline has been executed, and the Pasco County/New River Reclaimed Water Interconnect is on schedule. The Pasco County Regional Reclaimed Water Interconnect Transmission project was approved by the Basin Boards for FY2004 funding. Since the draft of this Work Program was released in October, Tampa Bay Water has been added as a partner for the downstream augmentation of the Tampa Bypass Canal. This additional component is primarily responsible for the increase in cost over what was presented in the October draft.

Future Actions

Ongoing coordination with utility representatives continues as cost and scheduling issues are defined and resolved. There has been uniform support for the project from local community decision makers, and additional funding support continues to be sought at the federal level.

b) Largo/Clearwater/Pasco-ASR/Interconnect

Background

This feasibility, design and construction project is being undertaken to interconnect the Largo, Clearwater and Pasco County reclaimed water systems. The project is expected to provide an additional 3 mgd of reclaimed water annually, offsetting an estimated 1.8 mgd of potable water from Tampa Bay Water. The project involves systems in Pasco and Pinellas counties, and future opportunities may exist to include Hillsborough County. By interconnecting, the excess reclaimed water during wet weather and supply deficits during dry weather periods could be better managed. The result is reduced wet weather discharges to tide, more effective reclaimed water utilization, and potential natural systems enhancement in Pasco County. Since the interconnect(s) would be more effectively utilized if seasonal storage were available, two separate reclaimed water ASR systems are expected to be part of the project. These separate projects will include determining the feasibility for a 4.5 mgd dry season capability at the Clearwater East WWTP and another 4.5 mgd dry season capability at the Largo WWTP. One test well and three production wells are anticipated at each site. Pending results of the feasibility study, the ASR wells may be designed and constructed as separate projects. This project is a key element of the District's recent efforts to encourage maximum beneficial use of reclaimed water in the Tampa Bay area, and will allow for treated wastewater flows in the highly urbanized coastal areas to be returned inland to the area of its origin. This will allow for enhanced recharging of the aquifer, and restoration of water dependent natural systems. Currently, much of this water is sent to tide during wet weather.

Linkage to the Regional Water Supply Plan

As stated in the RWSP (page 89, paragraph 3, page 164, bullet #7), an important goal in the development of reclaimed water as an alternative water source is to increase utilization by maximizing storage. This project involves the development of two ASR systems that will provide a significant amount of storage for excess wet weather flows. This project is specifically referenced in the RWSP on page 165, Table IVD-3, project #1. There is a detailed description of this project on page 172.

Status

The first phase of the Project (ASR feasibility & permitting) is proceeding according to schedule. The data from the feasibility study is encouraging and both Largo and Clearwater have applied for a combined total of \$850,000 in FY2004 District funding for the construction of one 1.5 mgd ASR test well within each of their systems. The City of

Clearwater will also request an additional \$250,000 in District funding for FY2005 related to increased cost estimates for their initial ASR test well. The \$50,000 total District contribution approved for the feasibility and permitting phase of the project was encumbered in FY2002.

Future Actions

Following the completion of the feasibility phase, the project will proceed into the design and permitting phase.

III. Water Supply Development Assistance

Although not a required element of this report, the District's water supply development assistance efforts have been included because of the significant magnitude of annual funding provided by the District, and the District's ongoing commitment to continue this funding in an effort to ensure there are adequate water resources to meet existing and future reasonable and beneficial uses. The District has budgeted for 109 water supply development projects in FY2004. As shown in Table 3, the total amount of District funding for these projects is nearly \$55 million. Most of these projects are matched on a 50-50 cost share basis with local cooperators, including local governments, regional water supply authorities and others. In addition, a number of projects have received state and federal funding.

Table 3. FY2004 Reclaimed Water Projects

Project	FY2004 Funding
Manatee County Agriculture Reuse Supply	\$4,210
So. Sarasota County Reuse	\$4,035
N Pinellas Reuse Interconnections	\$545
N.E. Polk County Regional Reuse	\$1,498
Hillsborough County South/Central ASR Test Well	\$2,346
Lowry Park Zoo Groundwater Reuse	\$469
Falkenburg Reclaimed Water Storage Tank	\$235,783
South Tampa Area Reclaimed Project (STAR)	\$2,450,496
NW Hillsborough Reuse System, Phase 2A	\$939
NW Hillsborough Reclaimed Water ASR Phase 2	\$1,408
Homosassa Regional Wastewater & Reuse	\$1,133
Pasco County Starkey Blvd. Reclaimed Transmission	\$1,133
Citrus County Reclaimed Water Transmission System	\$1,133
Pinellas County N Reclaimed Water System Storage	\$1,090
Lake Tarpon ASR Testing	\$3,397
South/Central Reclaimed Water ASR	\$1,408
Largo Reclaimed Water Distribution Part X	\$251,090

Project	FY2004 Funding
Clearwater Drew & Union Street Reuse	\$1,090
Oldsmar Forest Lakes Loop Reuse	\$1,991
Oldsmar Curlew Road Reuse Extension	\$1,991
Pinellas Park Reuse Phase V Transmission	\$1,329
City of Dunedin Reclaimed Water Transmission & Distribution	\$3,320
Largo Reclaimed Transmission Part XI	\$545
S Pinellas Reclaimed Water ASR Feasibility Study	\$398,397
Clearwater HRB Oaks Reuse Transmission/Distribution	\$1,090
St Pete Mangrove Bay Golf Reuse Storage Pond	\$1,090
St Pete NE Reuse Storage Tank	\$1,090
Tarpon Springs SE Reuse Transmission	\$1,090
Pinellas Park Reuse Phase IV Distribution	\$3,320
Venice Reuse Construction	\$1,729
Pinellas County North/South Beach Reuse Construct	\$2,183
St Petersburg ASR	\$4,807
Oldsmar Reuse Distribution	\$1,329
Dade City Reclaimed Water Transmission Phase 2	\$1,133
Wauchula Mine Reuse	\$998
Largo Reclaimed Distribution XII	\$251,090
Tarpon Springs Reclaimed Storage	\$1,090
Tarpon Springs Golf Reclaimed Telemetry	\$1,637
St Petersburg NW/SW Reclaimed Storage	\$1,090
Charlotte County Victoria Estates Reuse	\$1,498
Manatee Agricultural Reuse	\$1,729
Englewood Reclaimed Water Transmission	\$2,881
Wildwood Reclaimed Water	\$1,133

Project	FY2004 Funding
City of Sarasota Reclaimed	\$552,646
Hillsborough County Northlakes Reclaimed Water	\$200,939
North Sarasota County Reclaimed	\$2,881
Oldsmar Forest Lakes Blvd Reclaimed Water	\$3,320
Pinellas County Reclaimed Water Storage	\$444,340
Clearwater Seville/Sunset Reclaimed Transmission	\$1,090
Dunedin Solon Ave Reclaimed Water	\$3,320
City of Sarasota Payne Park Reuse	\$1,729
Braden River Utilities Ph 2,3,5,9 Expansion	\$1,729
Pinellas Co Pilot ICI Conservation Project	\$2,142
Soil Moisture Sensor Project	\$302,142
Bradenton Reuse System Extension	\$1,152
Tampa Efficient Irrigation Rebate Program	\$469
Tampa Bay Fisheries Wastewater Reuse Project	\$939
Manatee County MARS Storage Enhancement Studies	\$200,000
Englewood Lemon Bay High School Reuse Extension	\$151,763
Tarpon Springs Reclaimed Water Storage Facility	\$676,090
Clearwater Del Oro Groves Reclaimed Wtr Pump/Trans/Distribution	\$2,066,090
Oldsmar Reclaimed ASR Feasibility and Permitting	\$76,827
Largo Reclaimed Water Distribution Part XIII	\$951,090
Largo Reclaimed Water Residential Customer Metering	\$301,090
Dunedin Reclaimed Water Distribution Telemetry Systems Controls	\$235,320
Temple Terrace Reclaimed Water System Project	\$508,993
VanDyke Reclaimed Water Storage Tank & Pump Station Expansion	\$301,408
Pasco County Wesley Center Reuse Storage Piping Improvements	\$77,266
Odessa WWTF Reclaimed Water Pump Station	\$41,133

Project	FY2004 Funding
Pasco County Residential Reuse Metering Retrofit Program	\$180,133
Pasco County Grand Hampton/Live Oaks Reuse Transmission Main	\$143,633
Lake Placid Reuse	\$101,498
New Port Richey Design/Construction Jasmine Hills/Woodridge Reuse	\$360,833
Hernando County Silverthorn Golf Course Reuse	\$386,408
Brooksville Construction of US-41 South Service Area Reuse	\$444,420
Dade City Reuse System Downtown Extension	\$208,500
Reuse and Alternative Supplies	\$26,966
Water Planning Alliance Regional System Plan and Engineering	\$2,499
Heartland Alliance Water Supply Plan	\$2,499
Charlotte County Regional Reclaimed Water Expansion	\$444,748
Polk County Utilities Southwest Regional WWTF Phase 2	\$543,375
Polk County Utilities Northwest Regional WWTF Phase 1	\$701,624
Tampa Plumbing Retrofit and Education	\$101,408
Total Reclaimed Water Projects	\$14,407,235

Table 4. FY2004 Conservation Projects

Project	FY2004 Funding
Urban Mobile Lab Program	\$17,042
Indoor/Outdoor Water Conservation Program	\$55,175
Water Conservation Initiative	\$28,482
Tampa Residential/Com Toilet Rebate Project	\$939
Sensible Sprinkling St. Petersburg	\$429
Pinellas ULF Toilet Rebate Program	\$1,311,213
St Petersburg Private Shallow Well Feasibility	\$2,760
St Petersburg Toilet Replacement	\$1,713

Project	FY2004 Funding
Pasco County Rain Sensor/Soil Moisture Irrigation	\$5,000
St Petersburg Private Shallow Well	\$1,090
Manatee County Water Conservation Landscape	\$2,881
Hernando County Low-Flow Toilet Replacement	\$1,286
Hernando County Rain Sensor Installation	\$1,286
USF Xeriscape Demo Garden	\$500
St Pete I-275 Xeriscape	\$500
Tampa Housing Authority Water Fixture Retrofit	\$1,286
Sarasota County Toilet Rebate	\$577
Polk County Utilities Toilet Rebate Program	\$51,843
Total Conservation Projects	\$1,484,002

Table 5. FY2004 Potable Water Projects

Project	FY2004 Funding
Peace River Regional Reservoir Expansion	\$1,693,956
Peace River Facility Expansion	\$6,529,912
Water Supply & Resource Development Reserves	\$15,205,094
Punta Gorda Potable ASR	\$3,397
S Pasco Wellfield Berm Modification	\$2,760
Manatee County ASR	\$4,807
Bradenton ASR	\$4,988
North Port ASR Feasibility	\$64,102
Partnership Projects Expenditures	\$15,173,839
Desoto County Potable Water Transmission	\$250,000
Total Potable Water Projects	\$38,932,855

Source: SWFWMD FY2004 Summarized Programmatic Activities Report

Table 6. FY2004 Total Funding for Major Water Supply Development Projects

Project Totals	FY2004 Funding
Reclaimed Water Projects	\$14,407,235
Conservation Projects	1,484,002
Potable Water Projects	38,932,855
Total FY2004 Funding	\$54,824,092

IV. Funding Sources

The source of District funding for the water resource and water supply development projects listed in this report includes the Cooperative Funding Program of the Basin Boards, the New Water Sources Initiative and Water Supply and Resource Development Fund funded by the Governing and Basin Boards, portions of the District's State allocated Florida Forever funds, and Federal sources. Each of these funding sources is described below.

A) New Water Sources Initiative (NWSI) - The NWSI was established by the Governing Board as a part of its FY1994 budget. FY2004 represents the eleventh year of NWSI funding. The purpose of this fund is to enhance financial assistance opportunities for alternative water supply projects. The Governing Board has allocated \$10 million per year for eligible NWSI projects. Beginning in FY1995, Basin Boards receiving benefits from the selected projects have matched the Governing Board's \$10 million per year, for a current total of \$20 million per year in District funding. Currently, 14 NWSI projects ranging from ASR, to regional reclaimed water systems, to seawater desalination, are in various stages of development. NWSI projects generally receive 25 percent of their funding from the Governing Board, 25 percent from the appropriate Basin Board(s) and the remaining 50 percent from the cooperator. In addition, a number of NWSI projects have received federal funding assistance. Matches from local cooperators may be less than the current 50 percent in the future as the District focuses on the water supply needs of non-public supply users.

B) Cooperative Funding Program - The District is unique among the five water management districts in the State with its composition of eight Basin Boards. The Boards share the ad valorem millage capacity of the organization with the Governing Board and fund water resource management projects specific to each Basin. The Basin Board Cooperative Funding Program funds projects on a cost share basis primarily with local governments (although other entities, including private entities, are included). Projects include reuse, conservation, storm water management, hydrologic

investigations, and education, among others. The Cooperative Funding Program provides approximately \$20 million per year for water supply development projects, which is typically matched by local cooperators. Local matches may diminish in the future as the composition of local cooperators changes.

C) Water Supply and Resource Development Fund – The FY2004 General Fund budget includes WSRD projects of \$10.4 million, including salary costs. The General Fund has \$19.2 million available in WSRD reserves. The FY2004 budget includes an additional \$11.8 million, for total of \$31.0 million in General Fund WSRD reserves for allocation to future projects. Collectively, the Basins FY2004 budgets include WSRD projects of \$14.7 million, including salary costs. The combined Basins have \$10.5 million available in reserves. The combined Basins have budgeted an additional \$3.4 million in FY2004 for WSRD reserves, for a total of \$13.9 million available for allocation by the Basins to future projects. The combined FY2004 budget includes \$25.1 million for WSRD projects and \$15.2 million for WSRD reserves, for a total of \$40.3 million for WSRD. For planning purposes, projections are that the General Fund and Basins will collectively contribute as least \$6 million to this program annually from FY2004 through FY2007 (General Fund \$3 million and Basins \$3 million). One hundred twenty two million is planned to be allocated to WSRD projects over the period of FY2000 through FY2007. This is comprised of \$82.6 million that is dedicated to specific projects and \$39.1 in WSRD reserves to be allocated to future WSRD projects. The WSRD project funding includes leveraged funding of \$13.4 million from the Florida Forever Trust Fund for the Lake Hancock Outfall Wetland Treatment System, and \$2.1 million in state grants for SWUCA agriculture conservation projects.

D) The Florida Forever Act - The Florida Forever Act (FFA) is a \$10 billion, 10-year, statewide program that will provide the District approximately \$23.6 million per year for land acquisition, environmental restoration, and water resource development. At least 50 percent of these funds must be spent on land acquisition over the life of the program leaving an average of approximately \$13 million annually potentially available for environmental restoration and water resource development. A “water resource development project” is defined as a project eligible for funding pursuant to Section 259.105, F.S., that increases the amount of water available to meet the needs of natural systems and the citizens of the State by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, or promoting reuse. Implementation of eligible projects under Florida Forever includes land acquisition, land and water body restoration, ASR facilities, surface-water reservoirs and other capital improvements. It does not include construction of treatment, transmission, or distribution facilities.

E) Federal Revenues - In 1994, the District began investigating the feasibility of obtaining federal matching funds for water projects funded under the District's NWSI program. The District, in cooperation with members of Florida's congressional delegation, local government and regional water supply authority sponsors, was successful in obtaining funding for five NWSI projects. Local governments and regional water supply authorities within the District have received approximately \$60 million through 2001. Additional Federal funds will be sought for appropriate projects in the future.

V. Summary/Conclusions

The water resource and water supply development projects and funds identified above reflect the District's continuing commitment to ensure that adequate water resources are available to meet both existing and future reasonable and beneficial needs. In addition to those projects and funds identified above, the District has used and anticipates continuing to use portions of its Florida Forever funds for water resource development. Challenges which lie ahead in implementing the RWSP include the establishment of minimum flows and levels, particularly in the SWUCA and the anticipated need for a recovery and prevention strategy. Once these levels and flows have been established, the total water resource and supply development needs within the region will be better known.