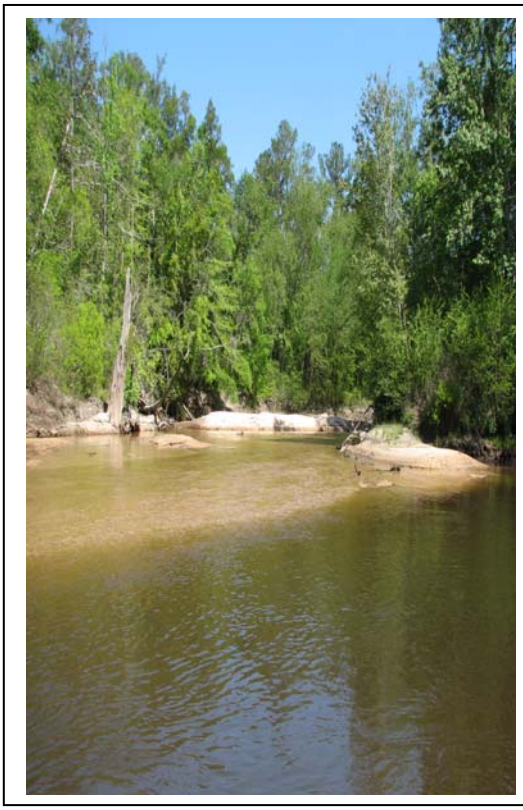
Northwest Florida Water Management District

Regional Water Supply Plan for Santa Rosa, Okaloosa, and Walton Counties Water Supply Planning Region II



Plan Update

September 2006

Approved October 26, 2006

Water Resources Assessment 06-01

NORTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

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Northwest Florida Water Management District
Regional Water Supply Plan Update

Region II: Santa Rosa, Okaloosa, and Walton Counties

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Acronyms and Abbreviations

ADR	AVERAGE DAILY RATE
AFB	AIR FORCE BASE
ASC	**AREAS OF SPECIAL CONCERN**
ASR	**AQUIFER STORAGE AND RECHARGE**
BEBR	BUREAU OF ECONOMIC & BUSINESS RESEARCH (UNIV. OF FLORIDA)
CUP	CONSUMPTIVE USE PERMIT
DWU	DESTIN WATER UTILITIES
ECUA	ESCAMBIA COUNTY UTILITIES AUTHORITY
FS	FLORIDA STATUTES
FCSC	FLORIDA COMMUNITY SERVICE CORPORATION
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FRUS	FAIRPOINT REGIONAL UTILITY SYSTEM
ft.	FEET
ft^2/d	FEET SQUARED PER DAY
ft^3/sec	CUBIC FEET PER SECOND
gal/d	GALLONS PER DAY
gal/min/ft	GALLONS PER MINUTE PER FOOT
in/yr	INCHES PER YEAR
mg/L	MILLIGRAMS PER LITER
Mgal/d	MILLION GALLONS PER DAY
mi^2	SQUARE MILES
MFL	MINIMUM FLOWS AND LEVELS
NWFWMD	NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RO	REVERSE OSMOSIS
RUA	WALTON/OKALOOSA/SANTA ROSA REGIONAL UTILITY AUTHORITY
RWSP	REGIONAL WATER SUPPLY PLAN
SSRUS	SOUTH SANTA ROSA UTILITY SYSTEM
SWUC	SOUTH WALTON UTILITY COMPANY
USACOE	UNITED STATES ARMY CORPS OF ENGINEERS
USGS	UNITED STATES GEOLOGICAL SURVEY
WFRPC	WEST FLORIDA REGIONAL PLANNING COUNCIL
WMD	WATER MANAGEMENT DISTRICT
WMLTF	WATER MANAGEMENT LANDS TRUST FUND
WPSPTF	WATER PROTECTION AND SUSTAINABILITY PROGRAM TRUST FUND
WRCA	WATER RESOURCE CAUTION AREA
WS	WATER SYSTEM
WSA	**WATER SUPPLY ASSESSMENT**
WWTP	WASTEWATER TREATMENT PLANT

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
REGION II WATER SUPPLY PLAN UPDATE

EXECUTIVE SUMMARY

Since the late 1970s the Northwest Florida Water Management District has been involved with Floridan Aquifer water supply issues in Santa Rosa, Okaloosa, and Walton counties, where declining Floridan Aquifer levels prompted concerns about the long-term sustainability of regional water supplies. Significant progress has been made in researching and understanding the region's hydrology and hydrogeology, as well as in developing more sustainable water supplies for the growing region. This plan update presents the District's strategy for continued implementation and progress toward meeting the region's water needs through 2025.

The District developed the 2000 Regional Water Supply Plan (RWSP) pursuant to the requirements of Chapter 373, Florida Statutes (FS), to recommend a strategy to meet the water needs of the region and to protect the region's water resources and related natural systems. The plan must be updated every five years. The initial plan (NWFWMD, 2000) describes in detail how groundwater withdrawal in the coastal area has caused a decline in Floridan Aquifer levels that threatens the potable aquifer with saltwater intrusion. The plan also outlines a strategy of water resource and water supply development projects to better balance needs with sources.

This plan update builds on the approach and accomplishments of the 2000 RWSP by focusing on the following three priorities:

1. Complete implementation of current tasks and ongoing work,
2. Increase the amount of reclaimed water use for beneficial purposes, and
3. Identifying and initiating work on long-range (2020 and beyond) solutions.

The planned work falls into two categories defined by statute: ***water resource development projects*** and ***water supply development projects***. Generally, water resource development is the District's responsibility, and water supply development is the responsibility of local governments, utilities, and individual users. A key function of this plan update is coordinating a balance between these levels of responsibility so that tasks at all levels are aimed at accomplishing the plan's goal and objectives. For the purposes of the Region II plan, Water Resource Development consists of:

- Floridan Aquifer Sustainability Modeling
- Inland Sand-and-Gravel Aquifer Modeling
- Surface Water Source Alternatives and Feasibility Analyses
- Aquifer Storage and Recovery Analysis
- Reuse Coordination and Development
- Conservation Coordination and Development
- Regional Water Supply Planning, including Strategic Planning, Coordination and Funding Mechanisms for Alternative Water Supply Development and Water Resources Protection

- Hydrologic Data Collection, Monitoring, and Analysis
- Abandoned Well Plugging

Water Supply Development consists of implementing preferred alternative water supply options targeted to reduce the demand on coastal groundwater sources as well as those that meet the Region II future demands. Feasible alternatives may include inland groundwater serving coastal users, direct withdrawal from surface water sources, small watershed impoundments augmented by main stem river flows, reclaimed water use (reuse), innovative demand management techniques and practices, alternative storage techniques, and facility interconnections and improvements. Water supply development alternatives that have or are currently being planned which are estimated to meet demands through and beyond 2025 are included in the following categories:

- Inland Sand-and-Gravel Aquifer Wellfields
- Inland Floridan Aquifer Wellfields
- Water Reuse
- Conservation and Demand Management
- Surface Water Direct Withdrawal Supply and Storage Facilities
- Alternative Water Supply Facility Improvements

The District will continue to work cooperatively with local governments, water supply utilities, and major water users within Region II to identify and implement additional alternatives for water supply. Alternatives will be evaluated for consistency with statutory guidelines, environmental and technical feasibility, cost feasibility and funding commitments, and consistency with this plan. As promising alternatives for water supply are identified and proposed on an ongoing basis, the District works cooperatively with water suppliers to obtain necessary commitments and approval for implementation.

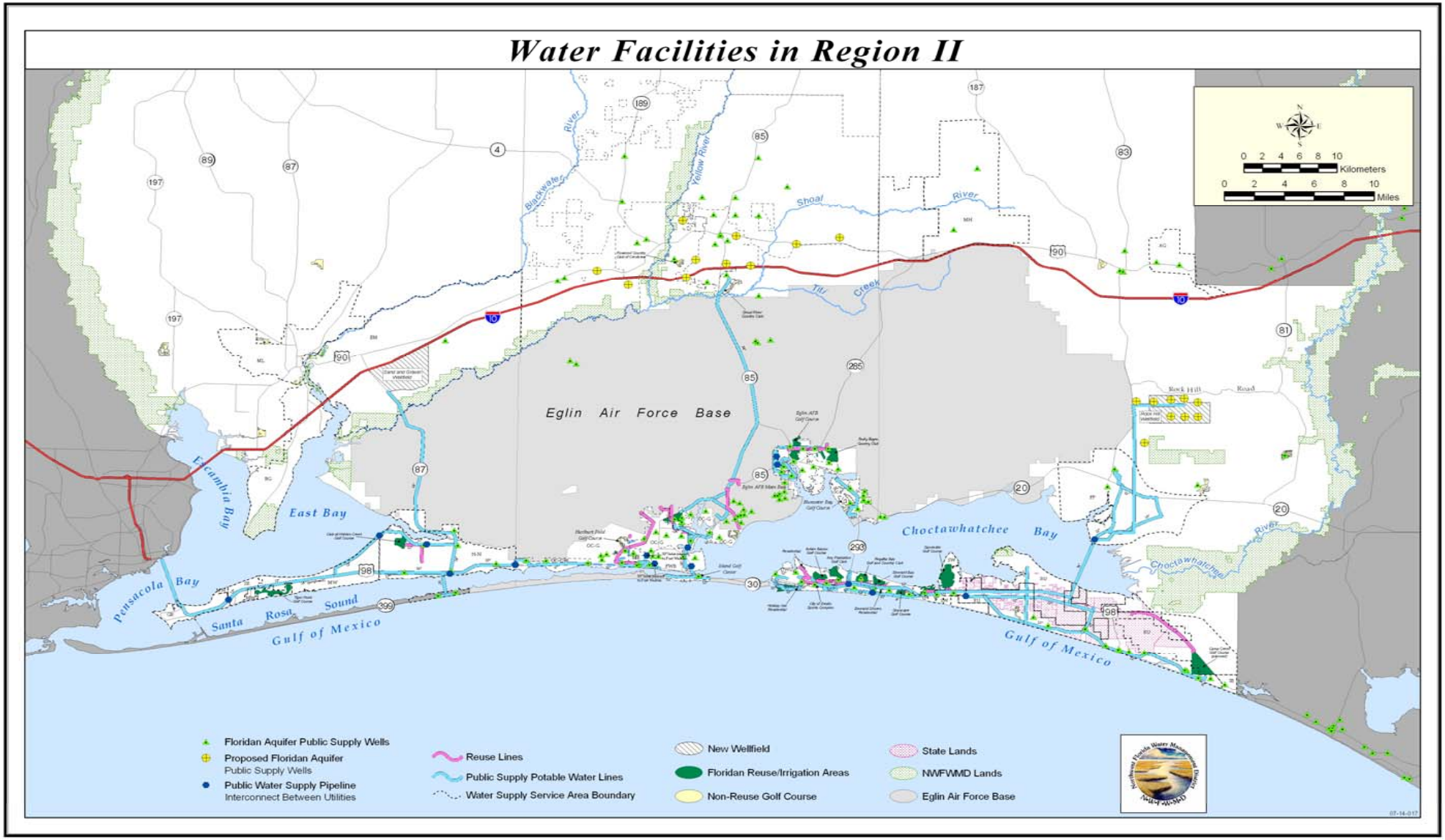
The implementation of water resource and water supply development strategies will be evaluated and reported on annually through the Water Resource Development Work Plan (WRDWP) reporting requirements of section 373.036(7), FS. Funding plans for alternative water supply development activities will also be incorporated in the WRDWP and the Consolidated Annual Report required by section 373.036(7)(b), FS.

Funding sources for plan implementation include the Water Protection and Sustainability Trust Fund, District general revenue funds, Florida Forever capital improvements funding, the Water Management Lands Trust Fund, legislative grants and appropriations, state and federal grant and loan programs, local government and utility revenues, and funding from other water use entities.

Current (2005) public water supply demand in Region II is estimated at 48.87 Mgal/d. Demand for 2025 is projected to increase by 28.83 Mgal/d to 77.7 Mgal/d. The Water Resource Development component of this plan identifies an additional 77 Mgal/d that may become available, and the Water Supply Development component specifically identifies 11.4 Mgal/d currently under development. Since 2000, an additional 16.7 Mgal/d of alternative supply has been developed. Section 373.0361(2)(a)2, FS, requires

that the total capacity of the plan's projects must exceed the projected demands. Thus, it is expected that this plan's implementation will exceed the 2025 demand for Region II.

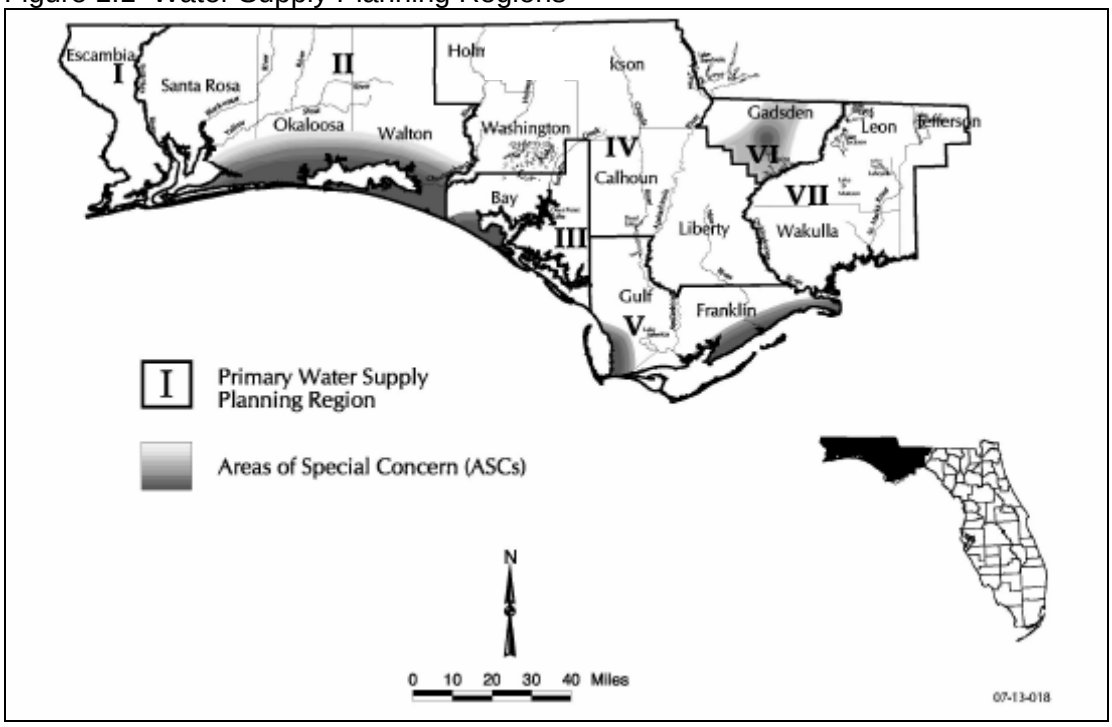
Water Resource Development Component		
Activity	Quantity	Partners/Funding
Floridan Aquifer Sustainability	30 Mgal/d	NWFWMD, RUA
Sand-and-Gravel Aquifer Sustainability	14.4 Mgal/d	NWFWMD, RUA
Surface Water Resources Development	Up to 25 Mgal/d	NWFWMD, Local Gov't
Reuse	~5 Mgal/d	NWFWMD, Local Gov't
Conservation	~2.5 Mgal/d	NWFWMD, Local Gov't
Alternative Water Supply Development Component		
Activity	Quantity	Partners/Funding
Inland Floridan Aquifer	9.0 Mgal/d currently under development (FY2006), future amount TBD	NWFWMD, Utilities, Local Governments
Inland Sand-and-Gravel Aquifer	1.4 Mgal/d currently under development (FY2006), future amount TBD	NWFWMD, Utilities, Local Governments
Reuse	1.0 Mgal/d currently under development (FY2006), future amount TBD (~ 4.0 Mgal/d)	NWFWMD, Utilities, Local Governments
Surface Water Resources Development	Up to 25 Mgal/d	NWFWMD, Utilities, Local Governments


Water Facilities in Region II
Eglin Air Force Base
Blackwater River
Yellow River
Shoal River
Titi Creek
Escambia Bay
East Bay
Pensacola Bay
Santa Rosa Sound
Gulf of Mexico
Choctawhatchee Bay
Choctawhatchee River
Rock Hill Road
0 2 4 6 8 10 Kilometers
0 2 4 6 8 10 Miles
Floridan Aquifer Public Supply Wells
Proposed Floridan Aquifer Public Supply Wells
Public Water Supply Pipeline Interconnect Between Utilities
Reuse Lines
Public Supply Potable Water Lines
Water Supply Service Area Boundary
New Wellfield
Floridan Reuse/Irrigation Areas
Non-Reuse Golf Course
State Lands
NWFWMD Lands
Eglin Air Force Base

1.0 Introduction

The Northwest Florida Water Management District conducted a district-wide water supply assessment in 1998 that identified Region II (Santa Rosa, Okaloosa, and Walton counties, Figure 1.1) as an area needing a Regional Water Supply Plan (RWSP) as directed in section 373.036, Florida Statutes. The plan was approved by the Governing Board in February 2001 (NWFWMD, 2000) and has since been in implementation. The district-wide Water Supply Assessment (WSA) was updated in 2003 (NWFWMD, 2003) to include more recent projections of water demand to the year 2025. This update incorporates and includes the 2000 RWSP and its supporting material, and as such is intended to augment the 2000 RWSP.

Figure 1.1 Water Supply Planning Regions



Since the 1940s groundwater withdrawals from the Floridan Aquifer in the coastal area of Region II have caused a significant decline in the potentiometric surface of the aquifer (Figure 1.2). This decline threatens the aquifer as a source of potable water by inducing saltwater intrusion. As a result, the District declared the coastal area of Region II as a Water Resource Caution Area (Figure 1.3) to help manage the threat to the aquifer. Such designation, adopted in District rules, restricts further withdrawals from the aquifer and requires reuse of treated wastewater for non-potable uses where feasible (Ch. 40A-2, Florida Administrative Code).

Figure 1.2 Potentiometric Surface of the Floridan Aquifer, 1998

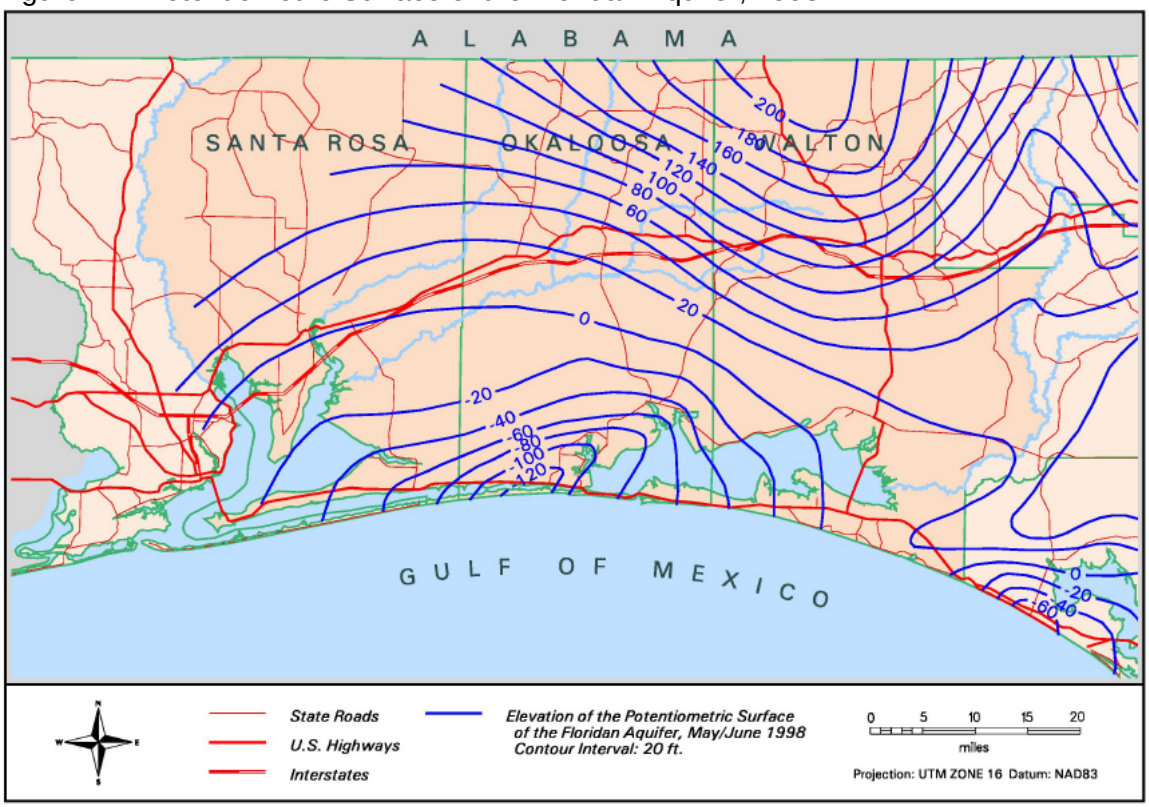
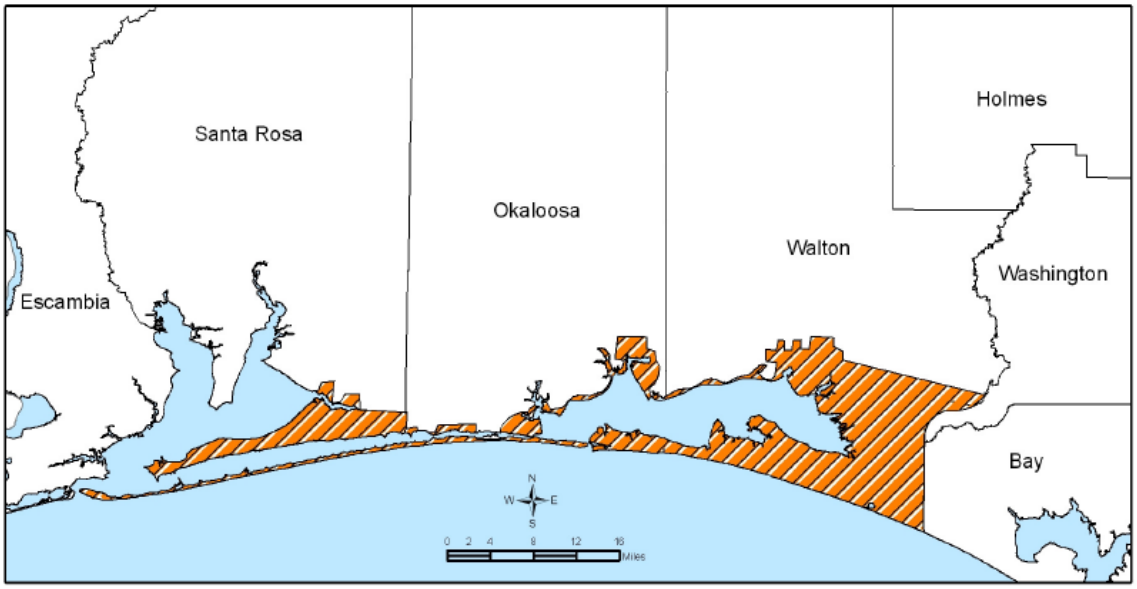


Figure 1.3 Designated Water Resource Caution Areas



The 2000 RWSP identified ten water resource development strategies to address the issue and to identify alternative water sources to meet the region's future water needs. The RWSP is re-evaluated and updated every five years.

Substantial progress has been made in implementing the RWSP and meeting the water needs of the region by the public and private utilities serving the area, local governments, the District, and cooperating agencies. This progress is described in this plan update, as are changes that have occurred since the original RWSP was adopted in 2000—such as the Water Protection and Sustainability Program enacted by the 2005 Florida Legislature. This new program provides funding to assist with the identification, planning, and implementation of water resource and water supply development projects.

1.1 Purpose

The purpose of this plan is to update the 2000 RWSP per the requirements of s. 373.0361, FS, by:

- Summarizing the progress made in implementing the 2000 RWSP for Region II (consisting of Santa Rosa, Okaloosa, and Walton counties),
- Updating the water demand projections used in the 2000 RWSP with figures from the 2003 WSA update,
- Identifying water resource development strategies and tasks, and
- Identifying alternative water supply development implementation activities and needs.

1.1.1 Plan Goal and Objectives

The overall goal of the Region II Water Supply Plan is to maintain groundwater withdrawals in the coastal Water Resource Caution Area at sustainable levels by developing alternative water supplies to meet present and future water demands in an environmentally sound and economically feasible manner.

The objectives of Region II Water Supply Plan are to:

- Define and implement a Water Resource Development Work Program (WRDWP) that will ensure regional water needs are met within the capability of regional resources, and
- Identify Alternatives for Water Supply Development that can be implemented by local governments, utilities, and other entities in Region II to meet future demands while sustaining water resources and related natural systems.

Success Indicators

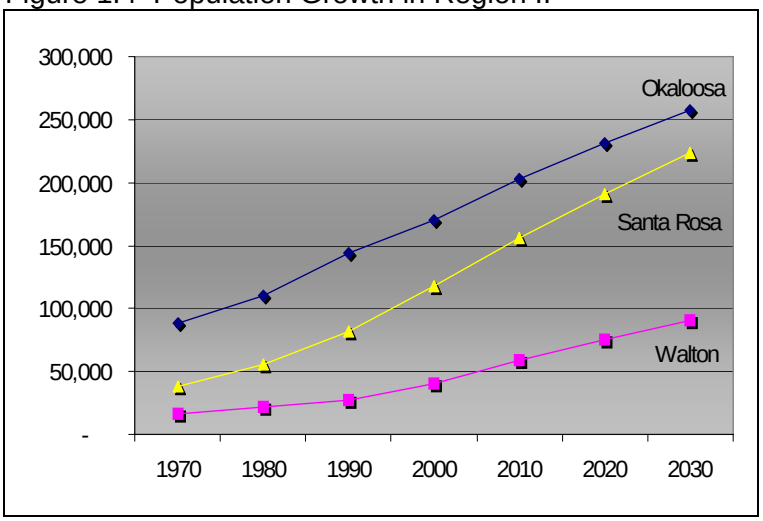
- Stable or increasing groundwater levels of the coastal Floridan Aquifer
- Increased water reuse and water conservation
- Number of recommended feasible water supply alternatives successfully implemented
- Amount of water made available through water supply alternatives
- Positive economic and environmental net benefits identified by Region II plan water supply alternatives.

1.1.2 Planning Process

Chapter 373.036, FS, requires the District to conduct a district-wide water supply assessment to assess the availability of existing and known water supply sources to meet reasonably projected future needs without harming water or related resources and existing legal water uses. Areas where demand is expected to exceed currently available supplies within the planning horizon are determined by the Governing Board to require a Regional Water Supply Plan.

The Region II planning area includes all of Santa Rosa, Okaloosa, and Walton counties. As seen in Figure 1.4, Region II has experienced an increasing rate of growth since the 1980s, with a majority of the population in the unincorporated areas of the three counties. Region II's population is projected to grow 55% by 2025 over the 2000 population, to over 508,000 residents (NWFWMD, 2003).

Figure 1.4 Population Growth in Region II



Source: Bureau of Economic and Business Research, University of Florida

Table 1.1 Overview of Region II

	Santa Rosa	Okaloosa	Walton
Population (2004)	Milton 7,512 Jay 586 Gulf Breeze 5,790 Uninc. 119,833 Total 133,721	Cinco Bayou 366 Crestview 17,026 Destin 12,015 Fort Walton 20,619 Laurel Hill 569 Mary Esther 4211 Niceville 12,791 Shalimar 723 Valparaiso 6,492 Uninc. 110,966 Total 185,778	DeFuniak Spr. 5,207 Freeport 1,234 Paxton 690 Uninc. 43,412 Total 50,543
Percent of Population in Unincorp. Areas	90%	60%	86%
Population Growth 1990 - 2000 2000 - 2004	 44% 14%	 19% 9%	 46% 24%
Percent of Population Served by Utilities	94%	93%	96%
Land Area	1,064 sq. miles 680,960 acres	936 sq. miles 599,040 acres	1,135 sq. miles 726,400 acres

Source: Bureau of Economic and Business Research, University of Florida

1.1.3 Accomplishments

The 2000 RWSP identified ten water resource development strategies; accomplishments in implementing each are summarized in this section.

Strategy 1. Floridan Aquifer Sustainability Model Analysis

Objective: Develop a solute transport model to analyze groundwater withdrawal scenarios from the Floridan Aquifer in coastal Santa Rosa, Okaloosa, and Walton counties and to serve as a management tool for implementing other water resource management programs and projects.

Accomplishments: The models have been used to simulate conditions under which future water demands are met and evaluate projected impacts (saltwater intrusion, wellfield development, and cumulative impact analysis). The models are used for assessing the cumulative effect of withdrawals from the Floridan Aquifer, the development of aquifer minimum levels, further development of water supply strategies (alternative and traditional), and for consumptive use permitting decision-making. An estimated sustainable amount of water withdrawal from the coastal Floridan Aquifer is 30 Mgal/d. Other model uses may include analyses of aquifer storage recovery, inland wellfield effects, wellfield optimization, and potential impacts on significant natural resources such as springs.

Strategy 2. Inland Sand-and-Gravel Aquifer

Objective: Develop a groundwater flow model for evaluating the Sand-and-Gravel Aquifer between the Blackwater and Yellow Rivers in Santa Rosa and Okaloosa counties as an alternative water source for existing and future coastal uses, thereby allowing the use of this alternative inland supply to reduce demand on the Floridan Aquifer as a source of supply.

Accomplishments: A steady-state groundwater flow model has been completed to evaluate the cumulative effects of withdrawals on aquifer levels. This water resource development activity has included installation of project-specific monitoring wells, data collection to determine aquifer yield potential, aquifer geophysical characterization, and aquifer modeling. Data have also been collected and developed to evaluate groundwater interaction with streams and wetlands. Wellfield development analyses indicate that at least an additional 12 Mgal/d can be made available from this source. The model may continue to be developed in conjunction with other ongoing alternative analyses in Region II involving the development of this water resource. This includes transient analysis of groundwater flow, induced recharge, and surface water/streamflow analysis.

Strategy 3. Coastal Sand-and-Gravel Aquifer Sources

Objective: Evaluate water availability from the Sand-and-Gravel Aquifer in the coastal area as a means to reduce local pumping from the Floridan Aquifer.

Accomplishments: A preliminary analysis of water availability has been completed and a technical report has been prepared. The report details the water bearing capacity of this source and identifies areas that have a high probability of being developed. The report estimates that at least 1.8 to 2.4 Mgal/d of additional production capacity for public supply is available from this source in the vicinity of Fort Walton Beach.

Strategy 4. Development of Regional Water Management Strategies

Objective: Provide administrative and logistic support necessary to implement and update the RWSP, including coordination, technical work, and securing funding.

Accomplishments: This administrative strategy has provided funding and project management; coordination with local governments, utilities, DEP, and other agencies; and preparation of the annual updates to the Five-Year Water Resource Development Work Program.

Strategy 5. Water Reuse

Objective: Promote and facilitate water reuse projects throughout Region II as a means to offset demands on potable-quality water from existing sources (Floridan and Sand-and-Gravel aquifers).

Accomplishments: Most of the utilities in Region II already have water reuse programs in place, including some that offset demand for potable-quality water previously used for irrigation. Estimates of water savings resulting from new quantities of full reuse implementation and the goal of this plan are 5 Mgal/d. Nearly all golf courses in the region use reuse water for irrigation and many landscaped public areas use reuse water for irrigation. The Water Protection and Sustainability Program Trust Fund has made funding available for eligible components of water reuse projects that offset use of Floridan Aquifer potable sources of supply. Continued implementation will target regulatory requirements and incentives, allowable components of eligible capital projects (e.g., reuse water storage facilities), and in the review and comment of local plans, plan amendments, and development reviews.

Strategy 6. Water Conservation Program

Objective: Promote and facilitate water conservation efforts throughout Region II as a means to offset demands on potable-quality water from existing sources (Floridan and Sand-and-Gravel aquifers).

Accomplishments: Past successes in promoting water conservation through regulatory and other District programs are continued through RWSP implementation. Estimates of water savings and the goal of this plan are 2.5 Mgal/d. Activities are primarily education and outreach, but also include review and comment on local land use plan amendments and reviewing developments of regional impact. Over 34,000 water conservation educational brochures and guidance documents on water conservation were provided to utilities in Region II for public distribution. In 2005 the District's Water Conservation Hotel and Motel Program (CHAMP) was initiated. This program seeks to reduce water demands of Region II's significant tourism-related businesses by increasing visitor awareness of water conservation opportunities.

Strategy 7. Development of Feasible Surface Water Sources

Objective: Collect adequate water quality and quantity data to support assessments and analyses of potential surface water supply sources from the Choctawhatchee and Yellow River basins.

Accomplishments: This strategy is targeted toward longer-range water supply planning, pending the results of viable groundwater strategies that are being implemented and scheduled near-term. The most recent accomplishment is the completion of a surface water feasibility analysis that indicates 25 Mgal/d may be feasibly obtained from surface

water supply sources. District staff have also completed considerable work to survey tributary basins, collect hydrologic and water quality data, and better define the overall potential of surface water source alternatives in the region, including sources beyond the year 2025. Surface water source alternatives being further considered are those that are anticipated to have minimal negative environmental impacts and possibly positive impacts. The overall flow reduction, up to 40 cubic feet per second (or cfs, approximately 25 Mgal/d), in the surface water systems being evaluated are relatively small.

Strategy 8. Hydrologic Data Collection and Analysis

Objective: Enhance the District's surface- and groundwater long-term monitoring capabilities in Region II to include an expanded network for the Floridan and Sand-and-Gravel aquifers where new sources are identified, providing adequate data and analyses to support water management strategies.

Accomplishments: Eight specific tasks are identified in the 2000 RWSP to augment the limited long-term hydrologic data collection network of stream gages and monitoring wells in Region II. All eight tasks are in various stages of completion. These monitoring efforts also provided essential data for model calibration, refinement, and validation as well as for continued characterization of surface and groundwater sources.

Strategy 9. Abandoned Well Plugging

Objective: This strategy is an ongoing regulatory activity of the District to protect available groundwater resources from aging, uncontrolled, or improperly constructed or abandoned wells that are no longer in use.

Accomplishments: From 1976 through 2004, the District recorded the plugging of nearly 2,350 abandoned wells within Region II. Plugging abandoned wells is a regulatory requirement but also may be contingent upon agreements with well-owners, local governments, and utilities.

Strategy 10. Aquifer Storage and Recovery Viability

Objective: Provide technical, financial, and educational assistance to Region II utilities, local governments, and interested parties regarding the evaluation and assessment of aquifer storage and recovery.

Accomplishments: The 2000 RWSP states that ASR should be evaluated further as other related projects (e.g., Floridan Aquifer sustainability modeling, surface water investigations, and Sand-and-Gravel Aquifer analyses) are completed. Coupled with action taken by the region's utilities, individually or in combination, ASR may be viable as a means for storing treated surface water and reclaimed water and possibly to reduce saltwater intrusion. This alternative will require the assistance and cooperation of a utility for further testing, including aquifer modeling, before it may be considered safe and cost effective. The District may begin to pursue this alternative now that aquifer modeling and surface water feasibility analyses have been completed. Economic and conjunctive use analyses as well as coordination with existing suppliers are needed in addition to technical analyses.

Table 1.2 Summary of Accomplishments

WRD Strategy	Status	Estimated Public Water Supply Identified or Made Available
Floridan Aquifer Sustainability Model	Completed 2006	30 Mgal/d
Inland Sand-and-Gravel Project	Completed 2005	18 Mgal/d total, 6 Mgal/d permitted, 12 Mgal/d avail.
Coastal Sand-and-Gravel Project	Completed 2004	2.4 Mgal/d
Strategy Development, RWSP and Plan Updates	Ongoing	n/a
Water Reuse Coordination Program	Ongoing	5 Mgal/d
Water Conservation Program	Ongoing	Demand offset estimated at 2.5 Mgal/d
Surface Water Monitoring for Surface Water Feasibility	Ongoing	25 Mgal/d
Hydrologic Data Collection and Analysis	Ongoing	n/a
Abandoned Well Plugging	Ongoing	n/a
Aquifer Storage and Recovery Viability	Pending further study, long-range alternative	n/a

2.0 Demand Estimates and Projections

Table 2.1 shows water use by category for the three counties in Region II, as reported by the U. S. Geological Survey (USGS) and depicted in Figure 2.1 and Table 2.2. The 2003 update to the District Water Supply Assessment extended water demand projections to 2025 and updated the five-year incremental projections (Appendix C). The results increase total projected demand by 50% to 107.3 Mgal/d in 2025. The previous RWSP identified a projected demand of 92.9 Mgal/d in 2020. The current assessment (NWFWMD, 2003) update contains additional detail regarding county-level and utility-level estimates and projections and the methodologies employed.

Table 2.1 2000 Water Use in Region II by County (Mgal/d)

	Santa Rosa	*Okaloosa*	*Walton*	**Total**
Public Supply	14.62	23.05	7.30	44.97
Domestic SS/Small Public SS	0.81	1.27	0.17	2.25
Commercial-Industrial SS	5.58	4.15	0.92	10.65
Recreational Irrigation	1.45	3.89	0.45	5.79
Agricultural Irrigation	0.34	0.20	0.05	0.59
Power Generation	0.00	0.00	0.00	0.00
Total	**22.80**	**32.56**	**8.89**	**64.25**

Figure 2.1 Projected Water Demand for Region II, 1995 - 2025

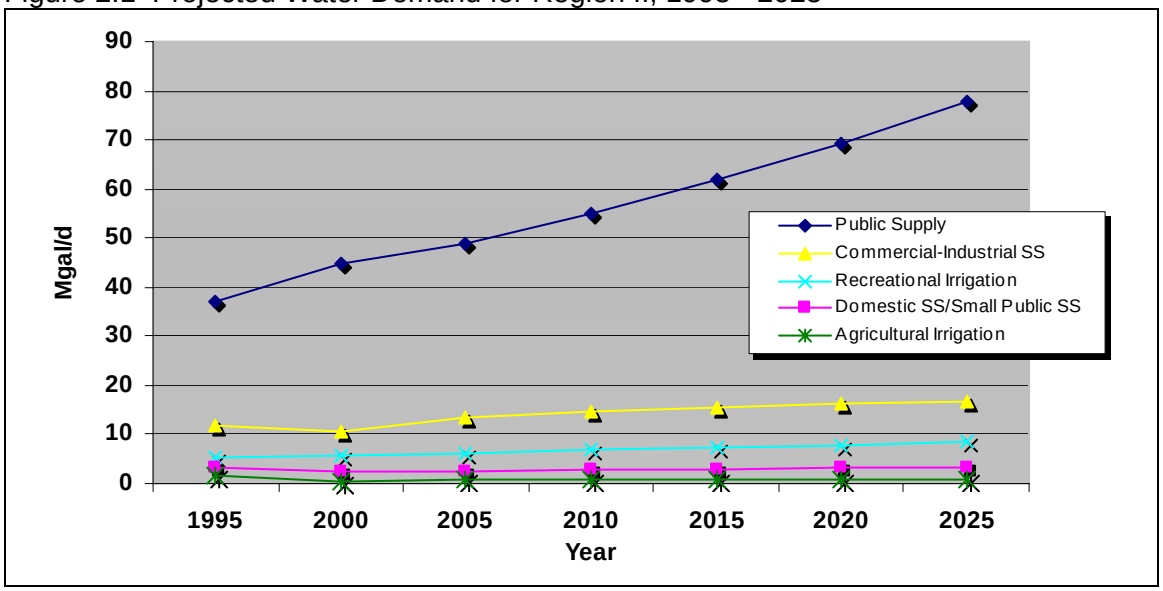


Table 2.2 Region II Water Demand Projections 2000 - 2025

Average Daily Flow (Mgal/d)						
	2000	*2005*	*2010*	*2015*	*2020*	*2025*
Water Use Category						
Public Supply	44.97	48.87	55.09	61.84	69.38	77.70
Dom. SS/Small Public SS	2.25	2.48	2.72	2.95	3.19	3.43
Commercial-Industrial SS	10.65	13.48	14.79	15.46	16.14	16.82
Recreational Irrigation	5.79	6.24	6.78	7.32	7.86	8.49
Agricultural Irrigation	0.59	0.62	0.69	0.73	0.81	0.86
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00
Total	**64.25**	**71.69**	**80.07**	**88.30**	**97.38**	**107.30**

Source: 2003 District-wide Water Supply Assessment, NWFWMD

2.1 Demand Methodology

Water demand projections were prepared using a number of data sources including the USGS, the University of Florida Institute of Food and Agricultural Sciences (IFAS) and the Bureau of Economic and Business Research (BEBR). For Public Supply, Commercial-Industrial Self-Supply, Recreational Irrigation, Agricultural Irrigation and Power Generation water use categories, the methodologies employed in Water Use Trends and Demand Projections in the Northwest Florida Water Management District (US Geological Survey, Open-File Report 98-269) were used in this update. Projections are based on extrapolation of observed trends in water use as reported by utilities, individual users, and other permittees. Published population projections (e.g., from BEBR) are used to gauge the likely applicability of the trend extrapolation and to select which demand model results are most likely to reflect future demand.

Table 2.3 Public Water Supply Demand Projections (Mgal/d)

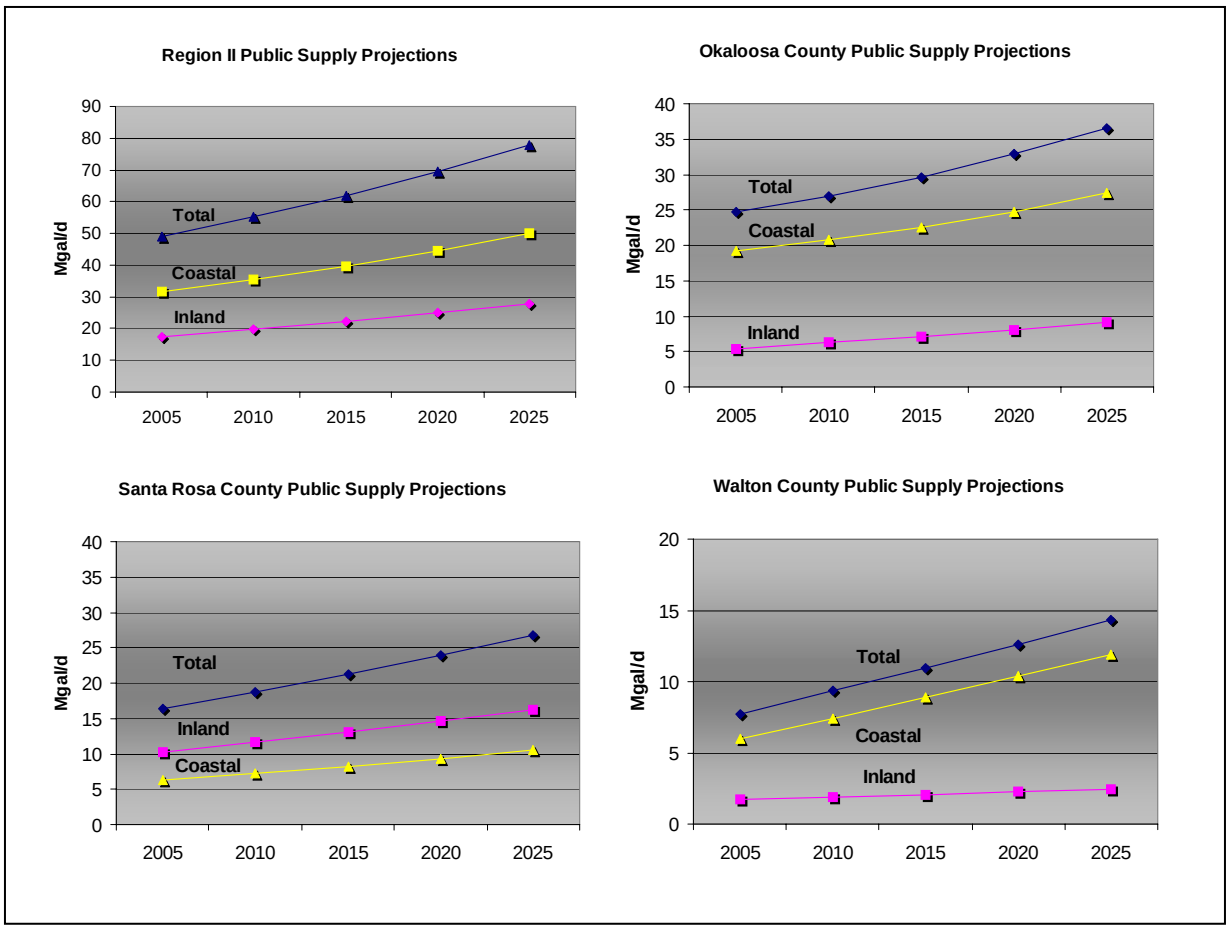
Okaloosa County	2005	2010	2015	2020	2025	2005 - 2025 Increase
Crestview	2.65	2.98	3.32	3.66	3.99	1.34
Auburn	1.43	1.67	1.95	2.27	2.66	1.23
OCWS - Mid-County	0.63	0.74	0.84	0.95	1.05	0.42
Baker	0.25	0.31	0.37	0.45	0.54	0.29
Holt	0.14	0.18	0.24	0.31	0.40	0.26
Milligan	0.17	0.19	0.20	0.22	0.23	0.06
Laurel Hill	0.15	0.16	0.17	0.18	0.19	0.04
Inland Subtotal	***5.42***	***6.23***	***7.09***	***8.04***	***9.06***	***3.64***
Destin Water Users	3.75	4.29	4.90	5.61	6.41	2.66
OCWS - Garniers	5.31	5.38	5.53	5.82	6.39	1.08
Niceville	3.38	3.73	4.08	4.43	4.78	1.40
Ft. Walton Beach	3.13	3.21	3.42	3.76	4.22	1.09
OCWS - Bluewater	1.27	1.47	1.72	2.02	2.16	0.89
OCWS - West	0.87	1.03	1.23	1.45	1.72	0.85
Valparaiso	0.76	0.82	0.89	0.95	1.02	0.26
Mary Esther	0.69	0.68	0.67	0.66	0.65	-0.04
Seminole Community	0.10	0.10	0.10	0.10	0.10	0.00
Coastal Subtotal	***19.26***	***20.71***	***22.54***	***24.80***	***27.45***	***8.19***
County Total	**24.68**	**26.94**	**29.63**	**32.84**	**36.51**	**11.83**

Santa Rosa County	2005	2010	2015	2020	2025	2005 - 2025 Increase
Pace	3.65	4.17	4.69	5.20	5.72	2.07
Milton	2.34	2.56	2.78	3.02	3.27	0.93
East Milton	1.42	1.73	2.04	2.35	2.63	1.21
Point Baker	0.96	1.09	1.22	1.35	1.48	0.52
Bagdad/Garcon	0.60	0.74	0.90	1.08	1.29	0.69
Chumuckla	0.34	0.41	0.49	0.58	0.69	0.35
Moore Creek/Mt. Carmel	0.35	0.39	0.42	0.46	0.50	0.15
Berrydale	0.23	0.26	0.29	0.33	0.37	0.14
Jay	0.27	0.27	0.28	0.29	0.29	0.02
Inland Subtotal	***10.16***	***11.62***	***13.11***	***14.66***	***16.24***	***6.08***
Midway	1.40	1.86	2.46	3.27	4.33	2.93
Holly Navarre	2.33	2.50	2.58	2.62	2.64	0.31
Gulf Breeze	1.36	1.59	1.81	2.04	2.27	0.91
South Santa Rosa	0.90	0.94	0.98	1.02	1.07	0.17
Navarre Beach*	0.30	0.30	0.30	0.30	0.30	0.00
Coastal Subtotal	***6.29***	***7.19***	***8.13***	***9.25***	***10.61***	***4.32***
County Total	**16.45**	**18.81**	**21.24**	**23.91**	**26.85**	**10.40**

Table 2.3 Water Demand Projections (Mgal/d, continued)

Walton County	2005	2010	2015	2020	2025	2005 - 2025 Increase
DeFuniak Springs	1.19	1.28	1.38	1.47	1.56	0.37
Mossy Head	0.16	0.21	0.26	0.34	0.43	0.27
North Bay Water Co.**	0.15	0.16	0.17	0.18	0.19	0.04
Paxton	0.18	0.18	0.18	0.18	0.18	0.00
Argyle	0.08	0.08	0.08	0.08	0.09	0.01
Inland Subtotal	***1.76***	***1.91***	***2.07***	***2.25***	***2.45***	***0.69***
Fla. Comm. Service Corp.	2.82	3.76	4.70	5.64	6.58	3.76
South Walton	2.55	2.92	3.28	3.64	4.01	1.46
Freeport	0.48	0.58	0.68	0.78	0.89	0.41
Inlet Beach	0.13	0.17	0.24	0.32	0.41	0.28
Coastal Subtotal	***5.98***	***7.43***	***8.90***	***10.38***	***11.89***	***5.91***
County Total	**7.74**	**9.34**	**10.97**	**12.63**	**14.34**	**6.60**

Figure 2.2 Public Water Supply Demand Projections 2005 - 2025



2.2 Results

The revised water demand projections result in a demand increase of 14.4 Mgal/d from the previous 2020 projections to the 2025 projections. As before, public supply is the largest category with a projected total demand of 77.7 Mgal/d, or 72% of the total projected 2025 water demand of 107.3 Mgal/d.

2.3 Uncertainties Associated with Demand Projections

As with any long-range projections, a degree of uncertainty exists that should be considered in the application of projected values. Water demand in Region II is overwhelmingly driven by population, land use and land availability, seasonality, and the future distribution of these factors. Thus, the long-range projections used in this document must be taken in the proper context.

The five-year plan update schedule, coupled with an annual review process, can help ameliorate uncertainties by providing opportunities for updating and modifying demand projections. The District-wide water supply assessment and the methodology used will be evaluated and updated in 2008, and the RWSP is scheduled to be updated again in 2010.

3.0 Resource Analyses

Ground water, surface water, and related resources are described in detail in the 2000 RWSP. The results of the Floridan Aquifer solute transport model provide a better understanding of flow rates and fresh and saltwater interaction in the aquifer (see *Saltwater Intrusion in the Floridan Aquifer in Walton, Okaloosa, and Santa Rosa Counties, Florida*, HydroGeologic, Inc., 2005). The recently completed surface water feasibility analysis describes feasible alternatives for surface water supply sources in Okaloosa County.

Historic and existing groundwater withdrawals from the Floridan Aquifer have caused a significant depression in the potentiometric surface of the aquifer, inducing saltwater intrusion within the aquifer's potable zone. Prior to 2000 RWSP implementation and the results of the solute transport model, there were gaps in the knowledge base regarding the likely location and movement of saltwater in the subsurface. These gaps limited the understanding of the risk that current and projected pumpage pose to the viability of the aquifer as a continued water supply.

Based on the sustainability model results, it appears that a moderate but reduced degree of groundwater pumpage can be sustained in the coastal area. However, additional future water supplies must be obtained from alternative inland groundwater and surface water sources. The extent to which current water demands are met from alternative sources (i.e., relocated from coastal to inland) will determine how well aquifer levels in the coastal area recover or remain stable.

3.1 Resource Protection Criteria

At this point there are no changes in resource protection criteria from those employed in the previous plan. Limiting further saltwater intrusion within the Floridan Aquifer is the primary criterion, as this directly affects the viability of the aquifer as a water supply. Potential impacts to existing legal uses, surface-groundwater interaction, and public health and safety are also being considered.

As surface water is further evaluated as a feasible alternative source of supply to meet future demands, required resource protection criteria will also continue to be closely studied. Such criteria have included: upstream watershed protection; instream and downstream impacts on streamflow; yield dependability; wetlands impacts, fish and wildlife, recreation and navigation, and existing legal uses consideration.

3.2 Tools for Resource Protection

Florida law provides that it is the policy of the state to promote the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems. In Florida this is accomplished primarily through the consumptive use permitting process, but may also include two related statutory programs: minimum flows and levels (MFLs) and/or water reservations. These requirements establish District-derived standards for the use and management of surface and ground water, and are implemented through the District's consumptive use permitting process and water resource projects.

These two tools represent options available to the District to meet its obligations to ensure the water needs of natural systems, but each includes issues that have to be considered as part of an overall water resource management strategy. For example, establishing MFLs could be seen as setting a low-range target by, in essence, declaring all flows and levels above the minimum "fair game" for competing human uses. Although modeling of cumulative impacts on a minimum flow and the District's consumptive use permitting program can be controlling factors to limit this "fair game" concept, the legal ramifications are untested in the case of waters controlled by upstream states. For this reason public water supply sources that are largely derived from within the State of Florida may be more easily protected and considered a preferred alternative. Reservations may preclude the use of some water sources leaving a full range of flows to meet future water needs of natural systems). Careful consideration is merited in the application of either or both sets of tools.

3.2.1 Minimum Flows and Levels

As defined by statute, the minimum flow for a given watercourse is the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area, and the minimum water level shall be the level of groundwater in an aquifer and the level of surface water at which further withdrawals would be significantly harmful to the water resources of the area. Currently there is no known quantity of withdrawal as considered or proposed for water supply in this plan that is considered significantly harmful or harmful. Resource monitoring and analysis is a continuing effort as established and recommended in this plan to address this concern.

Minimum flows and levels have not been set in Region II. The District's 2005 MFL Priority List includes the coastal Floridan Aquifer in Santa Rosa, Okaloosa, and Walton counties, the Sand-and-Gravel aquifer in Santa Rosa and Okaloosa counties (between the Blackwater and Yellow rivers), and the Yellow River. The Priority List is updated annually and submitted to FDEP for review and approval (the list is published on the District's website at http://www.nwfwmd.state.fl.us).

3.2.2 Reservations

No water reservations have been established in Region II. Reservations are a means by which the District's Governing Board can reserve waters for nonconsumptive use per section 373.223(4), FS, which states:

> (4) The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be subject to periodic review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest.

This approach may be employed as a somewhat more conservative measure than MFLs when it is desired to protect the full range of flows above a minimum amount of flow reflected by the amount of flow reduction due to withdrawals.

4.0 Issue Identification

Much has been accomplished in Region II related to water supply since the District's initial water supply planning efforts in the early 1980s (NWFWMD, 2000). The accomplishments of the 2000 RWSP are summarized earlier. The key issue for Region II is the decline in the potentiometric surface of the Floridan Aquifer and the resulting threat of saltwater intrusion into the potable zone of the aquifer. Regional water supply needs associated with this management issue include:

- Application of groundwater and surface water models
- Resource monitoring
- Environmental and economic feasibility analyses of alternatives
- Completion of current and ongoing tasks, including capacity determination of new inland groundwater sources and facility siting commensurate with increasing demands and existing groundwater resource availability and identification of feasible surface water supply alternatives
- Growth trends and the distribution of growth reflecting current and future demand centers
- Identification of specific alternative supply projects in cooperation with local governments and utilities where appropriate
- Reuse and conservation projects
- Other regional-scale alternative sources evaluations (e.g., riverbank filtration, ASR)
- Regional coordination and assistance, and ongoing water resources planning

5.0 Evaluation of Water Source Options

Water supply source options generally fall into two categories--naturally occurring sources and techniques for water supply management. Naturally occurring sources in Region II include:

- Fresh Groundwater
    - Floridan Aquifer System (Okaloosa and Walton counties)
    - Sand-and-Gravel Aquifer (Santa Rosa and Okaloosa counties)
- Fresh surface water
- Brackish Groundwater
- Seawater

Management techniques are used to optimize natural sources and offset demand, reduce waste or losses, and otherwise enhance the yield of water supplies from natural sources. Although not considered to be new *sources* of water, these practices can be very effective in extending the use of existing sources. When appropriately applied, they ensure the maximum beneficial use of water resources while minimizing adverse impacts to water supplies and related natural systems.

Management techniques include:

- Use of Reclaimed Water (Reuse)
- Demand Management
    - Mandatory Conservation Practices
    - Water Shortage Declarations and Water Shortage Plan Implementation
- Aquifer Storage and Recovery
- Water Supply System Interconnections

For the purposes of plan implementation, source options are further defined as traditional and alternative (or nontraditional).

5.1 Traditional Sources

The traditional source for Region II is local groundwater withdrawal from the Floridan and/or Sand-and-Gravel aquifers. For the coastal areas, these traditional sources are insufficient to meet future needs. For inland areas, traditional sources are considered to be conditionally sufficient to meet future needs (conditions are typically determined on a case-by-case basis and specified on each consumptive use permit). Inland groundwater sources serving coastal users are considered nontraditional or alternative sources.

Traditional sources in the coastal area of Region II have been determined insufficient to meet projected future needs without causing adverse impacts due to saltwater intrusion of the Floridan Aquifer.

5.2 Alternative Sources

Alternative water supplies are defined in Chapter 373.019(1) as follows:
"Alternative water supplies" means

- saltwater;
- brackish surface and groundwater;
- surface water captured predominately during wet-weather flows;
- sources made available through the addition of new storage capacity for surface or groundwater,
- water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses;
- the downstream augmentation of waterbodies with reclaimed water;
- stormwater; and
- any other water supply source that is designated as nontraditional for a water supply planning region in the applicable regional water supply plan.

Inland groundwater sources serving coastal areas and direct withdrawal of surface water and similar fresh surface water supply options as determined to be feasible are also considered an alternative source of supply and designated a nontraditional source of supply in the region.

Although salt- and brackish water are identified as alternative sources in the statutes, the 2000 RWSP found that demineralization was not a feasible option in Region II due to high development, energy, and treatment costs and adverse environmental and water quality impacts from brine effluent disposal.

Alternative Water Supply Sources for Region II

- **Inland groundwater sources serving coastal areas, alleviating pumpage from coastal wells**

Traditional water supplies have been developed locally, using the Floridan Aquifer or the Sand-and-Gravel Aquifer in Region II. The 2000 RWSP designates inland groundwater sources (from the Floridan Aquifer and the Sand-and-Gravel Aquifer) for coastal supplies as nontraditional for the purposes of s. 373.0361, FS.

- **Reclaimed water**

Although considered to be demand management tools that extend the use of traditional sources, the various practices that use treated wastewater or stormwater are important components of the overall water supply strategy for Region II. They are considered to be preferred alternative sources where they offset the use of potable-quality water sources and are not part of a regulatory requirement that otherwise would have to be met (e.g., to resolve a wastewater disposal issue).

- **Surface water**

Surface water is considered an alternative source where withdrawals can be sustained without causing adverse and unacceptable environmental impacts. Direct surface water

withdrawals with or without offline storage are generally a preferable alternative to instream or main stem reservoir development due largely to the ability to manage ecological impacts more effectively. Wet-weather withdrawal is preferred because it typically causes less environmental stress on the source waters, but requires large storage areas or facilities.

Development of reservoirs on tributaries of the Yellow and Shoal Rivers and possibly elsewhere will be evaluated as part of a Water Resource Development strategy prior to becoming an approved Water Supply Development project. The District's study will provide a basis of comparison for surface water alternatives with minimized environmental impact and a positive cost-benefit ratio.

- **Riverbank filtration**

Riverbank filtration or in-bank filtration is another alternative water source that is being evaluated by the District for use in Region II. The approach uses collector wells near a river or stream that draw water through the riverbank, providing a level of pre-treatment by filtration and reducing associated costs and environmental impacts from direct instream withdrawal. This alternative source is classified as groundwater under the influence of surface water, since the technology draws from both ground and surface water.

- **Utility interconnections and related infrastructure improvements**

Projects that seek to provide multijurisdictional connectivity can be considered an alternative or nontraditional water supply source where such connections are in the public interest and serve to address regional water supply needs (temporary, emergency, disaster recovery/preparedness, or the subject of an interlocal or inter-utility agreement). Traditionally, each individual utility has provided delivery infrastructure within its service and/or franchise area using proprietary wells.

Disaster recovery following Hurricanes Opal, Ivan, Dennis, and Katrina has highlighted the need and benefits that can be gained by inter-utility connectivity. Based on preliminary discussion and comments from local utility directors, making interconnections work on a regional scale will require close coordination, equipment upgrades and replacements, addressing water chemistry concerns, and other related technical issues. Strategic location of duplicate and inland supply lines as well as inland alternative sources of supply is also an important consideration in alternative analysis.

5.3 Conservation

The coastal area of Region II is designated as a Water Resource Caution Area (WRCA) in the DWMP and in District rules (Ch. 40A-2, Florida Administrative Code). All public water supply utilities in the WRCA are required to implement conservation measures as a condition of permit issuance. These conditions may include any or all of the following:

- Full use of available reuse supplies
- A conservation rate structure (to discourage excess consumption)
- Drought-tolerant landscaping and high-efficiency plumbing fixture ordinances
- Elimination of yard meters, or measures discouraging and/or phasing out their use
- Eliminating aesthetic/augmentation non-potable uses (except swimming pools)

- Implementation of a meter testing and replacement program
- Reduction of losses to no more than 10 percent of withdrawn amounts
- Implement a plumbing retrofit program
- Implement a comprehensive public education and information campaign.

Permittees are required to prepare an annual report documenting progress and status of each of the conservation conditions imposed.

A study contracted by the District in 2000 for the RWSP evaluated conservation practices and opportunities of ten representative utilities in Region II. Conservation practices are implemented at three levels: operational (utility), consumer, and ordinances/building codes (local government). Examples of conservation practices in each of the three major categories include:

Operational	**Consumer**	**Ordinances/Bldg. Codes**
Leak detection surveys and water audits	Plumbing and irrigation system retrofits	Low-volume fixture requirements
Meter testing and replacement	Education and awareness	Xeriscape/landscaping and irrigation schedules
Conservation rate structures	Leak detection and repair	Dual-piping for reuse

Findings of note in the study include:

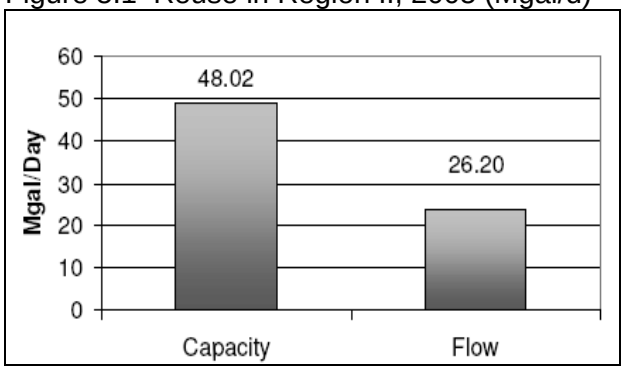
- Leak detection surveys are one of the more cost-effective practices for utilities.
- 90% of discovered leaks in public supply systems were with fire hydrants and valve packing.
- Conservation ordinances are more cost-effective for larger utilities than smaller.
- Meter testing is an essential component of system surveys because it can enhance revenues, account for “lost” water, and encourage consumer-level conservation.
- Residential irrigation is the largest use component for public supply systems.
- There can be an inverse relationship between conservation and a utility’s revenue stream. This must be factored with savings realized through system-wide loss recaptures.

The ten utilities included in the survey for the 2000 RWSP all had some degree of conservation measures implemented or planned, as well as additional measures that could be enacted. As part of further implementing the RWSP, these additional conservation education and outreach opportunities will be targeted. District conservation activities, beyond regulatory criteria, are in public education and outreach assistance (e.g., see the earlier discussion of the District’s Water Conservation Hotel and Motel Program (CHAMP).

5.4 Water Reuse

In Region II reuse water can be used to offset demand for potable quality water where the quality of the water is acceptable, such as for landscape and other forms of irrigation and similar uses. For the purposes of this plan reuse is considered beneficial by the District only when it offsets the withdrawal and use of potable-quality supplies.

Figure 5.1 Reuse in Region II, 2005 (Mgal/d)



Reuse data provided by FDEP's annual Reuse Report indicate that about half the region's reuse capacity is used to some degree. Reuse is a permitting requirement of FDEP for wastewater treatment facilities in areas designated by a water management district as a Water Resource Caution Area. District and FDEP regulatory staff routinely coordinate the implementation of reuse requirements. Effluent is treated to post-secondary level standards to ensure public safety and environmental integrity, and according to the level of public contact to reclaimed water. For example, reuse water that is used to irrigate golf courses or other publicly-accessible areas is treated to higher standards than reuse water used in non-public areas.

Further implementation of reuse for beneficial purposes in Region II will be actively supported by the District where it directly offsets demand for potable-quality water.

5.5 Cost Savings and Public Interest

Section 373.0361(2)(e), F.S. requires that the RWSP consider how options under the water supply and water resource development components serve the public interest or lessen overall costs by preventing the loss of natural resources or avoiding greater future expenditures.

The 2000 RWSP provides an analysis of how the public interest is served by the cost savings associated with maintaining the sustainability of the current rate or slightly lowered rate of use of the coastal Floridan Aquifer. This discussion is still relevant, especially since due to inflation and cost increases, the net value and cost savings of adequate, secure water supplies are higher in 2006 than in 2000. Subsequent sustainability model analyses conducted under the 2000 RWSP also show that complete replacement of the coastal wells using the Floridan Aquifer is not needed, Public interest is served by realizing there are also financially feasible water supply alternatives resulting from implementation of this plan.

The Water Protection and Sustainability Program is predicated on the Legislature's findings that action now to prevent future, more costly expenditures for water supply development is in the public interest.

6.0 Water Resource Development Component

The District's water resource development component for Region II is based on section 373.0361(2)(b), FS. This requirement stipulates that the plan contain a water resources development component that includes:

1. A listing of those water resource development projects that support water supply development.

2. For each water resource development project listed:

    a. An estimate of the amount of water to become available through the project.

    b. The timeframe in which the project option should be implemented and the estimated planning-level costs for capital investment and for operating and maintaining the project.

    c. An analysis of funding needs and sources of possible funding options.

    d. Identification of the entity that should implement each project option and the current status of project implementation.

Based on the definition of water resource development provided in section 373.019(22), FS, "water resource development" means the formulation and implementation of regional water resource management strategies, including:

- the collection and evaluation of surface water and groundwater 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 groundwater recharge augmentation; and
- related technical assistance to local governments and to government-owned and privately-owned water utilities.

6.1 Roles and Responsibilities for Water Resource Development

Chapter 373.196(3), FS, prescribes the role of the District in water resource development as it relates to alternative water supplies as follows:

(3) The primary roles of the water management districts in water resource development as it relates to supporting alternative water supply development are:

(a) The formulation and implementation of regional water resource management strategies that support alternative water supply development;

(b) The collection and evaluation of surface water and groundwater data to be used for a planning level assessment of the feasibility of alternative water supply development projects;

(c) The construction, operation, and maintenance of major public works facilities for flood control, surface and underground water storage, and groundwater recharge augmentation to support alternative water supply development;

(d) Planning for alternative water supply development as provided in regional water supply plans in coordination with local governments, regional water supply authorities, multijurisdictional water supply entities, special districts, and publicly owned and privately owned water utilities and self-suppliers;

(e) The formulation and implementation of structural and nonstructural programs to protect and manage water resources in support of alternative water supply projects; and

(f) The provision of technical and financial assistance to local governments and publicly owned and privately owned water utilities for alternative water supply projects.

6.2 Water Resource Development Projects

6.2.1 Floridan Aquifer Sustainability

The Floridan Aquifer sustainability model for the coastal area of Region II has been completed and is being utilized for application. Two domains have been established in Region II, a western domain that covers Santa Rosa and western Okaloosa counties, and an eastern domain that covers eastern Okaloosa and Walton counties. The model will be used as an evaluation tool for determining long-term yield from the Floridan Aquifer, consumptive use permit evaluation, withdrawal scenarios development to evaluate cumulative impacts, MFL development or reservations and the development of water management strategies.

Continued application of the model will determine the needs and opportunities to refine the model and improve its ability to effectively evaluate regional water management strategies. Components of this water resource development project include its application to inland/northern areas of Region II, particularly Walton County, and the need to continue to maintain and/or update the model as new data are acquired through the District's programs to evaluate saline intrusion and groundwater flow conditions in Region II. Analysis of drawdown effects of increased pumping on the inland Floridan Aquifer will be conducted using the sustainability model.

6.2.2 Inland Sand and Gravel Aquifer

The Sand-and-Gravel Aquifer provides most of the potable water used in Santa Rosa County. The aquifer is highly productive due to its high recharge rate from rainfall, which for water supply development purposes has been estimated by USGS studies in 1990 and 1995 at up to 18 inches per year. The aquifer is believed to be capable of providing regionally significant volumes of water; Sand-and-Gravel Aquifer wells yield as much as 1,440 gallons per minute.

However, the varying degree of hydraulic communication between the Sand-and-Gravel Aquifer and local streams and wetlands is a consideration in the analysis of potential withdrawals in order to avoid impact to these features. Since the inception of the RWSP for Region II, wellfield development of the Sand-and-Gravel Aquifer between the Blackwater and Yellow rivers has resulted in a permitted capacity of approximately 6.5

Mgal/d of alternative supplies for coastal Santa Rosa and western Okaloosa counties. Additional production capacity is needed to accommodate projected demands through and beyond the planning period. This additional capacity is addressed in the Water Supply Development Component of this plan in the following section.

Activities conducted under this water resource development project will center on wellfield siting and aquifer model application with the objective to optimize aquifer yields with little or no impact to water resources.

6.2.3 Development of Feasible Surface Water Sources

Surface water withdrawn from rivers and streams is a potential long-term (beyond 2020) alternative source of water supply for Region II. This includes taking advantage of wet-weather flow conditions which are less affected by withdrawals. Treatment and transmission costs and environmental impacts are the primary considerations for feasibility of surface water sources, as are public and utility acceptance.

As described in the surface water supply facilities planning and feasibility analyses report prepared by the District's water supply consultant in September 2006 (PBS&J, 2006), direct surface water withdrawal from the Shoal, Yellow, and other rivers, streams, and tributaries are feasible alternative water supply sources in Region II. Hydrologic analyses have been used to estimate a reliable amount of water that would be available and also maintain instream flow needs that limit the availability of surface water sources during periods of low flow. Low flow statistical analysis indicates near historical and seasonal minimum flows would still be reasonably maintained that protect the current flow regime of natural systems based on expected climatic variability. Currently, the amount of water needed to meet future water demands is a relatively small quantity of water and statistically within error and measurement limits that do not warrant MFL determination. Further feasibility analyses will consider the storage requirements of surface water supply systems to supply water during the low flow periods and maintain minimum flows. Storage requirements are those that will only require small reservoir systems, which can be designed to minimize environmental impacts, or in some cases result in net positive environmental benefits. Land acquisition and watershed protection are important components of this strategy.

As recommended by the report, the following course of action is planned:

- In coordination with Okaloosa County and through the Region II RWSP, meet and coordinate with local utilities and regional water suppliers to refine assumptions used in evaluation of alternative supply options.

- Evaluate conjunctive use management opportunities to facilitate coordinated management of surface and groundwater resources.

- Conduct detailed field investigations for environmental, cultural, land use, and technical constraints for the most favorable alternatives.

- Evaluate the riverbank filtration alternative further with a near-capacity sampling/monitoring well operating under high-flow and low-flow conditions, to ensure that all constituents of the water will be obtained and analyzed. This would be important for more accurate analysis of likely operation and maintenance and treatment costs.

- Collect samples of stream flow at likely withdrawal sites under a full regime of stream conditions, as above, to more particularly evaluate sludge management requirements related to potential constituents of concern, facility needs and operation and maintenance costs, and other treatment requirements.
- Conduct geotechnical investigations consisting of field and laboratory tests for borings and piezometers along the proposed dam alignments, embankments, and anticipated borrow areas, as well as potential sites for riverbank filtration facilities.
- Collect and analyze hydrogeologic data to define lithology and physical aquifer characteristics for the Sand-and-Gravel Aquifer within the riverbank filtration study area.
- Continue implementation of the Water Resource Development Work Program to further develop the surface water component of the RWSP.

6.2.4 Aquifer Storage and Recovery Feasibility

Storage is a critical component of a regional water supply management strategy for Region II due, at least in part, to the variability of alternative water supplies. Aquifer storage and recovery (ASR) is a possible means to balance high-demand, low-flow periods with low-demand, high-flow periods. Considerations that have to be evaluated include cost-benefit analyses, technical feasibility related to water quality, geochemistry, hydrogeologic parameters, and inter-utility logistics, treatment requirements, and regulatory aspects. Other considerations involve the user community, including the perception and acceptance of water supplies derived from ASR projects. The primary advantage of ASR is large, relatively protected storage capacity requiring no significant additional land area.

Aquifer storage and recovery demands a regional approach to determine its feasibility, as well as its management, since water introduced into a geologic formation might not remain within (or under) a single utility's jurisdiction or service area. A cooperative approach is essential to both a successful assessment and evaluation and to successful implementation. In the case of using ASR as a strategy to store and retrieve reclaimed water, the cooperation of both wastewater and water supply utilities may be needed. As described in the 2000 RWSP accomplishments, ASR is not considered to be a viable stand-alone water supply source, but in combination with other strategies might be viable as a storage and/or aquifer recovery component of a longer-term water supply strategy.

While large-scale ASR operations by the District may not be economically feasible at the present time, some larger individual utilities or collectives of utilities may find ASR to be useful and wish to explore this technology further. The District will work cooperatively with interested utilities to explore this technology further. These efforts would include technical, financial and research assistance to any utility or groups of utilities interested in pursuing ASR as an option for their water supply systems. The District will also explore in more detail the use of ASR as a salinity barrier to protect existing potable water supplies. This project would need to be coordinated closely with ongoing aquifer sustainability efforts, surface water monitoring and supply feasibility analyses and ongoing Floridan Aquifer Sustainability Model analyses. Possible funding sources for future ASR testing and development include WPSPTF, WMLTF, federal funds and public utilities.

6.2.5 Water Reuse

Reuse is required in designated Water Resource Caution Areas and strongly encouraged in other areas as a way to offset demand for potable-quality water supplies. The District will prioritize assistance with reuse projects that reduce overall demand for potable supplies from all sources in Region II.

Wastewater treatment and disposal and reuse activities are regulated by FDEP and coordinated with the District's consumptive use permitting program. Activities under the water resource development component of this plan are to provide funding and assistance to encourage water reuse as water supply development projects. Activities that can facilitate further reuse implementation in Region II include:

- Coordination with DEP, the District, local governments, and utilities, especially where conservation opportunities may exist;
- Investigating reuse efficient application rates for landscape irrigation in northwest Florida;
- Research on reuse reliability and the potential for augmenting or mixing reuse with ground water and stormwater sources;
- The need to improve reuse quality so it may be used in public access areas and more directly reduce demand on potable supplies;
- Research on storage and retrieval of reuse water to improve reuse availability and efficiency;
- Economic and environmental feasibility; and
- Cooperative funding for the development and continued operation of reuse facilities.

A study conducted as part of the 2000 RWSP development concluded that, even though irrigation demand for reuse water more than doubled for many utilities (due to lower costs, or no charge at all), about half the (reuse) irrigation demand in an urban public access reuse system results in potable water savings (PBS&J 2000). The study also found that peak reuse demand considerations need to be taken into account when estimating reuse water availability in the future in Region II. In other studies, a factor of 50 percent excess capacity has been used for planning purposes--for example, to serve a 1 Mgal/d annual average reuse demand, 1.5 Mgal/d of reclaimed water must be available.

6.2.6 Water Conservation

The District has actively pursued water conservation opportunities through its consumptive use permitting, public education and outreach, and local plan and project review programs. This water resource development project helps ensure that successful conservation practices will continue in the future through both regulatory and non-regulatory activities.

Current regulatory activities involve implementation of criteria stipulated in the District's Consumptive Uses of Water permitting rule, Chapter 40A-2, F.A.C. The rule requires utilities within the WRCA to submit water conservation plans, programs, and measures that are evaluated on their effectiveness to reduce water use demand and promote the efficient use of the area's water supplies. The utility conservation measures are

reviewed specifically for standards and implementation schedules with the goal to reduce annual average per capita water consumption to 110 gallons per day, or lower, through such actions as adopting water conservation-based rate structures, reducing leaks to 10 percent or less of the water withdrawn, and implementing water conservation public education programs.

Non-regulatory activities include assisting in the review of local plans, developments of regional impact, and by providing information and assistance to utilities and local governments as they implement their conservation programs and plans. Research activities may be considered as well, for example empirical studies to determine the water savings that may be realized through additional conservation efforts such as plumbing fixture and appliance rebate and retrofit programs, water use audits, lawn irrigation timers and sensors, and alternative metering strategies. An underlying objective for this water resource development project may be to accurately quantify the water savings resulting from all conservation efforts, in order to better identify and evaluate the most efficient and cost-effective conservation methods.

6.2.7 Regional Water Supply Planning

Water resource development recognizes that planning and plan implementation is an essential activity. It encompasses administration of the plan maintenance, monitoring and reporting activities necessary for successful plan implementation. These activities include:

- alternative water supply project planning and administration of RWSP implementation budgets and funding;
- administration of grant funds and contractual agreements with local governments, utilities, and other agencies;
- program monitoring and reporting responsibilities;
- providing assistance to the Regional Utility Authority, local governments, utilities, and multijurisdictional entities in Region II;
- updating demand projections and the District-wide water supply assessment update;
- coordination with DEP and the other water management districts;
- database development, improvements, and enhancements; and
- updating the RWSP every five years or more often as needed.

Two main components define this water resource development project. The primary component involves working with local governments, utilities, and other water suppliers to identify, plan, implement, and track water supply development projects (both traditional and alternative supplies), regional water supply planning, and demand forecasting. The secondary component involves administering, monitoring, and tracking plan implementation responsibilities and activities. Although staffing is limited, the District may also provide review of developments of regional impact, and technical planning assistance for local governments and other agencies when necessary.

6.2.8 Hydrologic Data Collection and Analysis

The District has developed short-term and long-term hydrologic data collection networks of stream gages and groundwater monitoring sites in Region II. Additional monitoring is also recommended or required as part of the consumptive use permitting process. As part of the regional water supply planning process and implementation of the RWSP, the District has enhanced its ground- and surface water monitoring capabilities, including an expanded network for the Sand-and-Gravel Aquifer and the Floridan Aquifer where new water sources have been developed. The expanded network is important for water supply planning and refining ground water models used for making management decisions and developing water management strategies.

The findings of the Floridan Aquifer sustainability model project specifically identified the need for additional groundwater monitoring in the coastal area of Region II. Existing and new production wells cannot effectively monitor for saltwater intrusion because they are too far inland and were developed to avoid saltwater wherever possible.

Activities and tasks identified for the implementation process include:

- Development of an enhanced hydrologic database;
- Development and implementation of plans for enhanced monitoring of long-term ground water and surface water sites, including both quantity and quality considerations as related to new areas of water withdrawal;
- Documenting the outcome of recently completed Region II Floridan Aquifer and Sand-and-Gravel Aquifer tests;
- Conducting ongoing monitoring of selected surface water and ground water sites for basic water quality parameters, water levels, and flow in the vicinity of sites that may be or are being given consideration as future water supply withdrawal points;
- Continuing the modernization of water use data management programs, including the development of water use data collection programs, which automate the data collection and mapping processes for the purpose of projecting and reporting water use; and
- Continued support of the development, enhancement and maintenance of hydrologic models and water resources data. The models will continue to be applied to assist with water management decisions that involve the cumulative impacts of water withdrawals and regional water management strategies.

This will be an ongoing project that supports all the water resource and water supply development projects and water supply planning efforts in Region II. All of the new and existing sources for water supply discussed in this plan are provided a significant level of protection through its implementation. Data reporting can be facilitated through the use of the District's website where the public, local officials, utilities, and interested parties can obtain recent updates, historical data, and links to related information.

6.2.9 Abandoned Well Plugging

The NWFWMD resource regulatory program has an active program to plug abandoned artesian wells. The overall goal of this program is to protect available ground water resources from old, uncontrolled or improperly constructed abandoned wells. The District's regulatory division achieves the proper abandonment of such wells through the use of two methods. The first approach is to require water well contractors to plug abandoned wells as they occur during construction or are found on site. These wells are normally of small diameter. Within Region II, from 1976 through mid-2000, the District has required the plugging of approximately 1,500 abandoned wells. The second approach has been to initiate a well abandonment contract with a well-owner or local government to provide financial assistance in those cases where plugging the abandoned well is considered critical to protecting the water resource or the public health. Within Region II, the District has entered into 10 well plugging contracts, resulting in the proper plugging of 139 abandoned wells that met this criterion.

Remaining within Region II are an estimated 40 known major wells to be plugged. This project would support District efforts to sustain coastal water supply sources, which currently are withdrawn at more than 25 Mgal/d.

Table 6.1 Water Resource Development Projects

Project	Responsible Entities	Purpose / Objective	Estimated Quantity	Time-frame	Funding
					NWFWMD
1. Floridan Aquifer Sustainability Model	NWFWMD	Refine, implement, and apply model for all of Region II	30 Mgal/d	2006 - 2011	$260,000
2. Sand-and-Gravel Aquifer Sustainability Model	NWFWMD	Refine, implement, and apply model	14.4 Mgal/d	2006 - 2011	$50,000
3. Development of Feasible Surface Water Sources	NWFWMD	Select feasible surface water alternative supplies; conduct detailed engineering and environmental analyses of selected sites, and assist with land acquisition	Up to 25 Mgal/d	2006 - 2011	$500,000
4. Aquifer Storage and Recovery Feasibility	NWFWMD	Assess feasibility of ASR technology in Region II, provide assistance and coordination oversight	TBD	2006 - 2011	$30,000
5. Reuse Coordination	NWFWMD, DEP, local	Assist and facilitate water reuse projects	5 Mgal/d	2006 - 2011	$75,000
6. Conservation Coordination	NWFWMD, DEP, local	Promote conservation projects and activities	2.5 Mgal/d	2006 - 2011	$75,000
7. Regional Water Supply Planning Strategies	NWFWMD	Administer planning program, maintain/update plan and reporting, database mgmt., update Water Supply Assessment, local government and utilities coordination	n/a	2006 - 2011	$300,000
8. Hydrologic Data Collection and Analysis	NWFWMD, Utilities	Monitor surface water flows and levels, ground water levels, water use, and water quality	n/a	2006 - 2011	$478,000
9. Abandoned Well Plugging	NWFWMD	Oversee, regulate, and facilitate abandoned well plugging (accomplished through Districts Resource Regulation Division)	TBD	2006 - 2011	$150,000

Note: Actual funding determined within the Water Resource Development Work Program on an annual basis.

7.0 Water Supply Development Component

This section of the plan identifies five categories of alternative water supply development projects:

- Inland Sand-and-Gravel Aquifer projects serving coastal areas,
- Inland Floridan Aquifer projects serving coastal areas,
- Feasible surface water projects,
- Reuse projects that offset demands from potable sources, and
- Water supply management projects.

Within each category, specific projects are identified for implementation by local governments, the District, utilities, and other entities responsible for providing public (or other) water supplies within Region II.

7.1 Water Supply Development Roles and Responsibilities

Water supply development projects are primarily in the purview of local governments, water supply utilities, and individual water users to implement. The District provides guidelines for identifying the types of projects and providing appropriate technical and financial assistance, in addition to its regulatory responsibilities for consumptive use permitting.

Water supply development is defined by section 373.019(24), FS as the planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use.

The role of local governments, water supply authorities, utilities, and other local entities in water supply development is defined as:

"The primary roles of local government, regional water supply authorities, multijurisdictional water supply entities, special districts, and publicly owned and privately owned water utilities in alternative water supply development shall be:

(a) The planning, design, construction, operation, and maintenance of alternative water supply development projects;

(b) The formulation and implementation of alternative water supply development strategies and programs;

(c) The planning, design, construction, operation, and maintenance of facilities to collect, divert, produce, treat, transmit, and distribute water for sale, resale, or end use; and

(d) The coordination of alternative water supply development activities with the appropriate water management district having jurisdiction over the activity."

Guidance criteria for water supply development projects are:

(a) Water supply development projects which are consistent with the relevant regional water supply plans and which meet one or more of the following criteria shall receive priority consideration for state or water management district funding assistance:

1. The project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible;

2. The project provides substantial environmental benefits by preventing or limiting adverse water resource impacts, but requires funding assistance to be economically competitive with other options; or

3. The project significantly implements reuse, storage, recharge, or conservation of water in a manner that contributes to the sustainability of regional water sources.

(b) Water supply development projects which meet the criteria in paragraph (a) and also bring about replacement of existing sources in order to help implement a minimum flow or level shall be given first consideration for state or water management district funding assistance.

7.2 Alternative Water Supply Development Process

Water supply options and alternatives are described in Section 5 and include surface water, groundwater, reclaimed water, and conservation and utility interconnections. Traditional water supply sources for Region II are locally withdrawn groundwater supplies from the Sand-and-Gravel and/or Floridan aquifers.

Water Supply Development project alternatives preferred by the District, as described in Section 5, include:

- Inland groundwater sources serving coastal areas,
- Reclaimed water and beneficial stormwater management,
- Surface water development,
- Associated utility interconnections and infrastructure improvements (e.g., storage), and
- Alternative/new storage techniques.

Additionally, the District is supportive of and encourages water conservation as a means of limiting future water demand and increasing efficiency.

Section 7.3 describes these alternative water supplies in more detail as they relate to current and potential water supply development projects. The list and summary Table 7.1 will be updated on an annual basis through the annual report as projects are proposed by local utilities and governments and determined eligible in accordance with this plan. The surface water feasibility assessment incorporated by reference (PBS&J, 2006) in the appendix and described in the Water Resource Development component is an example of the process.

The District's process for considering alternative water supply projects eligible for funding under the Water Protection and Sustainability Program is contingent on annual legislative appropriations to fund the program. Project proposals are considered as part of the District's annual budget development cycle and described, tracked, and reported on in the annual Five-Year Water Resource Development Work Program and subsequent Consolidated Annual Report.

Factors that the Governing Board shall give significant weight to in considering proposals for funding under the Water Protection and Sustainability Program include:

1. Whether the project provides substantial environmental benefits by preventing or limiting adverse water resource impacts.

2. Whether the project reduces competition for water supplies.

3. Whether the project brings about replacement of traditional sources in order to help implement a minimum flow or level or a reservation.

4. Whether the project will be implemented by a consumptive use permittee that has achieved the targets contained in a goal-based water conservation program approved pursuant to s. 373.227.

5. The quantity of water supplied by the project as compared to its cost.

6. Projects in which the construction and delivery to end users of reuse water is a major component.

7. Whether the project will be implemented by a multijurisdictional water supply entity or regional water supply authority.

Additionally, the Governing Board shall consider the following:

1. Whether the project is part of a plan to implement two or more alternative water supply projects, all of which will be operated to produce water at a uniform rate for the participants in a multijurisdictional water supply entity or regional water supply authority.

2. The percentage of project costs to be funded by the water supplier or water user.

3. Whether the project proposal includes sufficient preliminary planning and engineering to demonstrate that the project can reasonably be implemented within the timeframes provided in the regional water supply plan.

4. Whether the project is a subsequent phase of an alternative water supply project that is underway.

5. Whether and in what percentage a local government or local government utility is transferring water supply system revenues to the local government general fund in excess of reimbursements for services received from the general fund, including direct and indirect costs and legitimate payments in lieu of taxes.

Public input will be considered as provided through public regular Board meetings, as well as meetings accomplished through the regional water supply plan update process. Projects for which funding assistance is provided through the Water Protection and Sustainability Program must normally be specified within this chapter. The Board has the discretion, however, to allocate up to 20 percent of program funding toward other proposed projects so long as they are consistent with the goal of the plan.

7.3 Alternative Water Supply Development Projects for Region II

7.3.1. Inland Sand-and-Gravel Aquifer Alternative Water Supply

The (inland) Sand-and-Gravel Aquifer is designated as an alternative water supply source for coastal Santa Rosa and Okaloosa counties. The 2000 RWSP targeted the area between the Blackwater and Yellow rivers for detailed study for water production. The aquifer is considered to be productive in this area due to its high rate of recharge, estimated by the U.S. Geological Survey at up to 18 inches per year (USGS, 1995). A detailed numerical model of the aquifer between the two rivers was developed and tested using surface water protection and wetlands impacts as resource protection criteria. Production wells have been developed and are currently capable of producing about 6.5 Mgal/d to offset pumping from wells in the coastal area. Total production capability of the inland Sand-and-Gravel Aquifer wellfield is estimated at about 18 Mgal/d. Groundwater modeling and analysis and monitoring by the cooperating utility and the District is ongoing. Other opportunities to utilize the Sand and Gravel Aquifer in place of the Floridan Aquifer will continue to be explored.

Fairpoint Regional Utility System currently operates a series of wells in the inland Sand-and-Gravel Aquifer wellfield supplying water to south Santa Rosa County, including Gulf Breeze, Midway, Holley-Navarre, and Santa Rosa County. The inland wells are replacing wells in the southern coastal area of Santa Rosa County, alleviating pumping pressures in the Water Resource Caution Area. Currently an additional pumping well that can produce up to 1.4 Mgal/d is planned to replace a coastal well of equal volume. Additional expansion of the wellfield is expected in the future as additional demands are identified, revenue sources are identified and secured, and permit conditions are met.

7.3.2. Inland Floridan Aquifer Alternative Water Supply

Significant progress has been made in replacing coastal withdrawals from the Floridan Aquifer in south Walton County with alternative inland supply wells. The Rock Hill wellfield was developed as part of the 2000 RWSP implementation and is currently producing over 6.5 Mgal/d for coastal Walton County. Additional capacity, within the limits of this supply source, are planned to accommodate increased demand related to growth that is based on a build-out condition in the area.

This project will include installation of additional wells, chlorination facilities, ground storage, land acquisition, and transmission lines. Because the next series of wells may be located further to the east, the District and utilities are evaluating options for expanding the wellfield and facilities. This will serve to accommodate additional demands, reduce pumping and reliance on water supplies in the coastal area, and provide a measure of redundancy in the regional water supply and distribution system that will ensure the availability of potable water and enhance emergency response and preparedness into the future.

7.3.3. Water Reuse

Water reuse is a legislative priority of the Water Protection and Sustainability Program and Florida's overall water resources policy. Reuse has been an important component of the FDEP and the District's water management strategy since the 1980s and has resulted in offsetting demand for potable-quality water as well as better disposal of treated wastewater (i.e., eliminating surface water discharges of treated effluent).

Golf course and landscape irrigation is the predominant use of reclaimed water treated to public-access standards; nearly all golf courses in Region II use reclaimed water. Retrofitting existing residential areas for additional reuse for landscape and yard irrigation tends to be cost-prohibitive, but as new developments are planned and as redevelopment activities occur, increased use of reclaimed water will be pursued.

7.3.4. Surface Water Development

Surface water sources have not been developed in Region II to date due to the high quality and low costs of developing and distributing traditional ground water supplies. However, in the interest of securing long-term, viable sources of water supply, the feasibility of surface water sources for public water supply is currently being evaluated as a water resource development project (section 6.2.3).

Okaloosa County has requested the District's assistance in identifying a feasible, viable surface water supply alternative(s) for the county. This request included evaluation of the development of a large reservoir on the Yellow River previously studied by the USACOE. In order to not duplicate this effort the Yellow River reservoir study by the USACOE has been included as a component of the District's surface water feasibility analysis. Although considered physically feasible the USACOE study data indicates the project is not an environmentally acceptable alternative and given these and other significant constraints is also not economically feasible as an alternative for water supply. However, the preliminary engineering and feasibility analysis conducted by the District indicates that other environmentally and economically feasible alternative surface water supply sources are available that would meet projected long-term water demand. These alternatives may also be of considerable benefit to supplement existing demand. The Yellow/Shoal River basin has previously been identified in the 2000 RWSP as a more than adequate and abundant supply of water. Preliminary engineering analyses and planning are currently underway to identify specific alternatives that Okaloosa County may pursue to meet its long term needs. This includes engineering feasibility analysis for:

- Direct surface withdrawals
- Development of small impoundment within smaller tributary basins
- River Bank Filtration
- Conjunctive use and augmentation of existing groundwater pumping demand.

The initial feasibility and conceptual engineering work for these types of sources as an alternative water supply development project has been completed (PBS&J 2006). Following the preliminary feasibility analysis, more specific cost evaluations, design and engineering tasks, and resource development components of the surface water strategy are recommended for further development. Land acquisition for watershed protection

and restoration, facility development, and small tributary or offline reservoir development are anticipated additional components that the District may cooperatively engage with Okaloosa County and other utilities to further develop the preferred or selected alternative for surface water supply.

7.3.5. Alternative Water Supply Facilities

This project category accommodates nontraditional and other projects which enhance, augment, or facilitate meeting current and future water demands. Guidance is provided in section 373.019, FS, for defining alternative water supplies to include such management measures as storage and reuse. The District follows this statutory guidance and defines such management strategies as being part of an overall alternative or nontraditional water supply strategy. General activities and criteria include:

- Storage projects that ensure water supply availability consistent with permit conditions, emergency management, response, and disaster recovery; and

- Utility interconnections that provide for multijurisdictional, interlocal, and regional water provision and delivery systems serving the public interest (including emergency management, response, and disaster recovery).

The following list is updated annually as projects are identified by the District and eligible entities, and approved by the Governing Board. This project listing is contained in the annual update to the Five-Year Water Resources Development Work Program and Consolidated Annual Report.

Table 7.1 Alternative Water Supply Development Project Summary List

Project/Activities	Responsible Entities*	Purpose / Objective	Estimated Quantity (Mgal/d)	Time-frame**	Funding Amounts & Sources***		
					WPSPTF	NWFWMD	Local
7.3.1 Inland Sand-and-Gravel Aquifer Alternative Water Supply							
Sand-and-Gravel Wellfield Expansion	Local Govt. or utilities in App. A, as appropriate	Replaces coastal production well; additional replacement wells TBD as expansion needs of the existing new wellfield are identified and planned	1.4 Mgal/d	2007	$500,000	$500,000	$1,000,000
Additional Sand-and-Gravel Aquifer development	Local Govt. or utilities in App. A, as appropriate	Replaces coastal production wells; additional wells TBD	Up to 10.6 Mgal/d	2007 - 2011	TBD	TBD	TBD
7.3.2 Inland Floridan Aquifer Alternative Water Supply							
Rock Hill Wellfield Expansion	South Walton Utility Co., Regional Utilities	This project will include the installation of additional wells, chlorination facilities and ground storage transmission lines.	9.0 Mgal/d	2006 - 2008	$6,000,000	$1,000,000	$11,042,750
Additional inland Floridan Aquifer Development	Local Govt. and utilities in App. A, as appropriate	Replaces coastal production wells; additional replacement wells TBD	Up to 23 Mgal/d	2007 - 2011	TBD	TBD	TBD
7.3.3 Water Reuse							
Bob Sikes Water Reclamation Facility	Okaloosa County	This project will develop reuse capability for landscape irrigation	1.0 Mgal/d	2006	$2,000,000	$0	$4,000,000

Table 7.1 Alternative Water Supply Development Project Summary List (continued)

Project/Activities	Responsible Entities*	Purpose / Objective	Estimated Quantity (Mgal/d)	Time-frame**	Funding Amounts & Sources***		
					WPSPTF	` NWFWMD	Local
Water Reuse Facilities	Local Govt. and utilities in App. A	Construction of reuse facilities to replace potable water for landscape irrigation	+/- 4.0 Mgal/d	2007 - 2011	$4,000,000 ($1M/yr.)	TBD	$6,000,000
7.3.4 Alternative Surface Water Development							
Surface water direct withdrawal options: o Direct Withdrawal o Tributary Reservoir Development, Protec-tion, Restoration o Riverbank Filtration	Local Govt. and utilities in App. A	Development of alternative surface water supply source and conjunctive use	Up to 25 Mgal/d	2007-2011	~$8,000,000		$26,000,00 - $45,000,000
7.3.5 Alternative Water Supply Facilities (e.g., Storage, Interconnects)							
Above-Ground Storage Facility Construction and Improvement	Local Govt. and utilities in App. A	Capital improvements to increase and/or secure storage facility capacity	TBD	2007 - 2011	TBD	TBD	TBD
Water Supply System Facility Interconnects, Enhancements, and Improvements	Local Govt. and utilities in App. A	Assist with delivery system interconnects, facility improvements	TBD	2007 - 2011	TBD	TBD	TBD
Aquifer Storage and Recovery	Local Govt. and utilities in App. A	Capital improvements to increase storage capacity of alternative water supplies	TBD	2007 - 2011	TBD	TBD	TBD

*Utilities and local governments with water supply responsibilities within the designated WRCA (s. 40A-2.802(1), F.A.C.) are responsible for implementing alternative water supply development projects per s. 373.0361(7)(b), F.S., in consultation with the District. All other local governments and utilities within the region are encouraged to implement alternative water supply development projects as indicated and as defined in s. 373.019(1), F.S. in consultation with the District.
**The project timeframe is focused on the five-year update cycle of the Region II RWSP (2007 - 2011) unless otherwise specified.
***All dollar figures are in 2006 dollars.
Specific implementation activities will be identified annually by the District in cooperation with Region II local governments and utilities. They will be reported in the annual Water Resource Development Work Program and Consolidated Annual Report.

Appendices

Appendix A. Region II Local Governments and Utilities

Santa Rosa County

Local Governments

- Santa Rosa County
- Gulf Breeze
- Jay
- Milton

Utilities

- Bagdad/Garcon
- Berrydale
- Chumuckla
- East Milton
- Holly Navarre
- Midway
- Moore Creek/Mt. Carmel
- Navarre Beach
- Pace
- Point Baker
- South Santa Rosa

Okaloosa County

Local Governments

- Okaloosa County
- Cinco Bayou
- Crestview
- Destin
- Fort Walton Beach
- Laurel Hill
- Mary Esther
- Niceville
- Shalimar
- Valparaiso

Utilities

- Auburn
- Baker
- Destin Water Users
- Holt
- Milligan
- Seminole Community

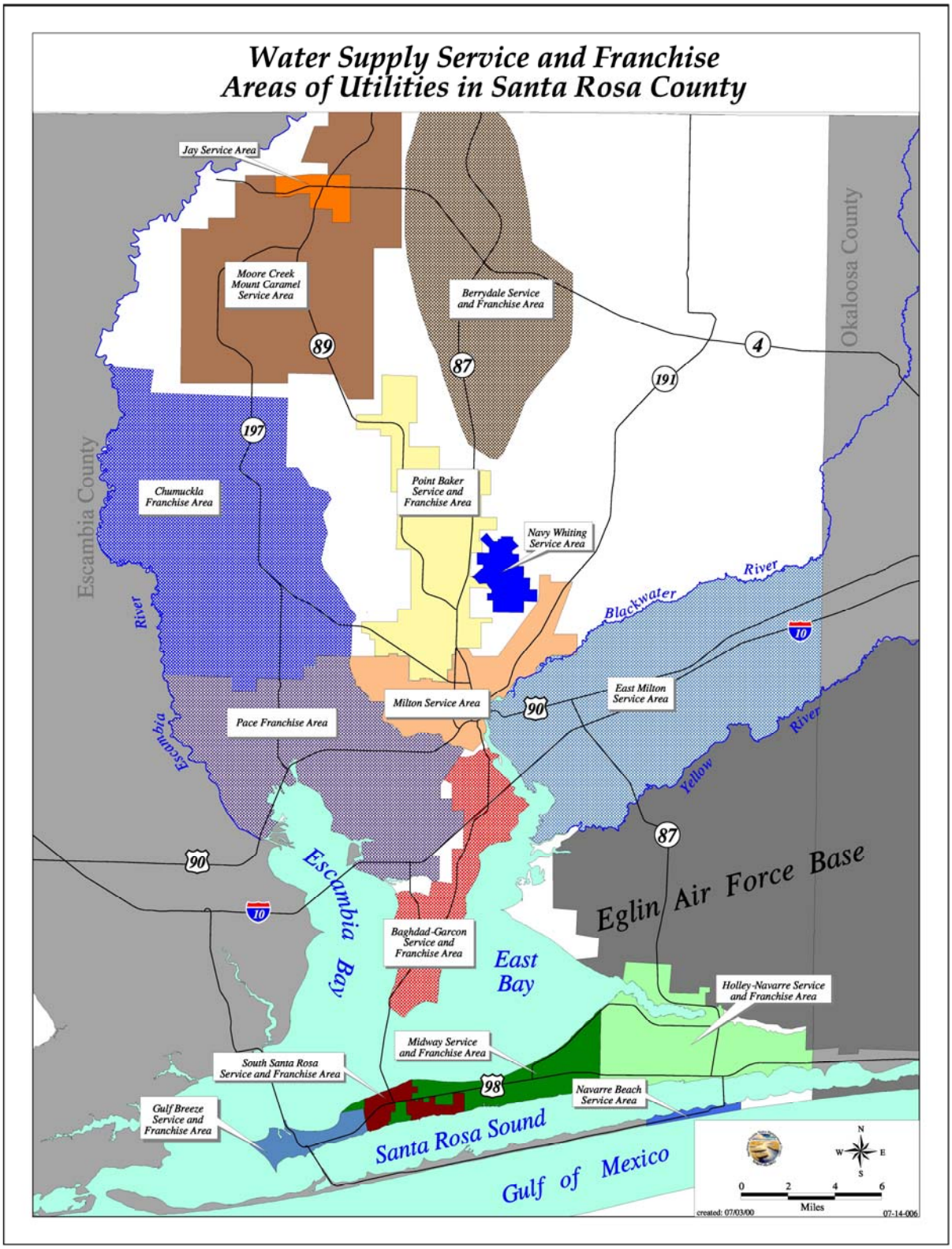
Walton County

Local Governments

Walton County
DeFuniak Springs
Freeport
Paxton

Utilities

Argyle
Inlet Beach
Mossy Head
North Bay Water
Regional Utilities
South Walton


Water Supply Service and Franchise
Areas of Utilities in Santa Rosa County
Jay Service Area
Moore Creek
Mount Caramel
Service Area
Berrydale Service
and Franchise Area
Okaloosa County
Escambia County
Chumuckla
Franchise Area
Point Baker
Service and
Franchise Area
Navy Whiting
Service Area
Blackwater River
East Milton
Service Area
Milton Service Area
Pace Franchise Area
Escambia River
Yellow River
Eglin Air Force Base
Escambia Bay
East
Bay
Baghdad-Garcon
Service and
Franchise Area
Holley-Navarre Service
and Franchise Area
Midway Service
and Franchise Area
South Santa Rosa
Service and Franchise Area
Navarre Beach
Service Area
Gulf Breeze
Service and
Franchise Area
Santa Rosa Sound
Gulf of Mexico
89
87
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197
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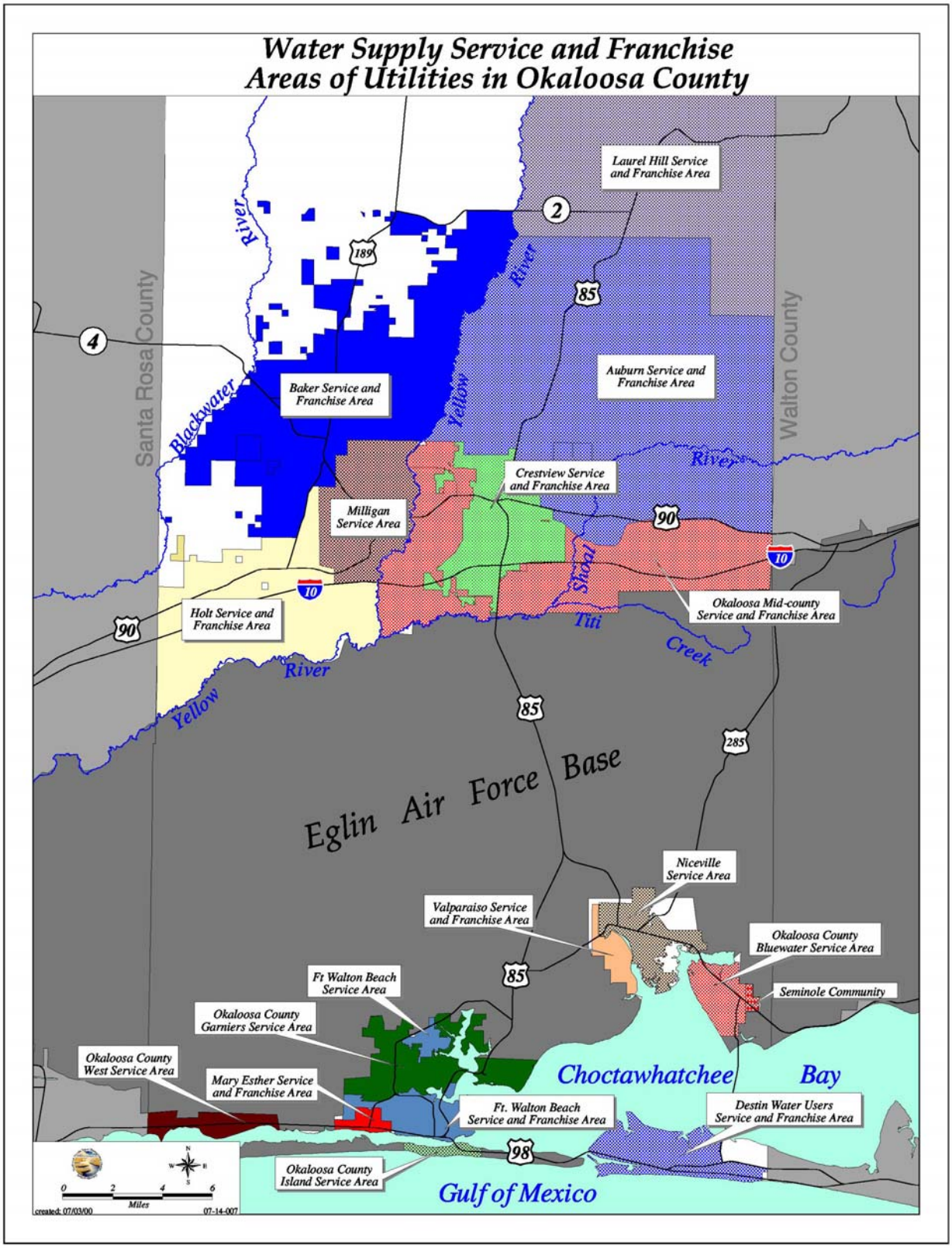
Water Supply Service and Franchise
Areas of Utilities in Okaloosa County
Laurel Hill Service and Franchise Area
Auburn Service and Franchise Area
Baker Service and Franchise Area
Crestview Service and Franchise Area
Milligan Service Area
Holt Service and Franchise Area
Okaloosa Mid-county Service and Franchise Area
Niceville Service Area
Valparaiso Service and Franchise Area
Okaloosa County Bluewater Service Area
Seminole Community
Ft Walton Beach Service Area
Okaloosa County Garniers Service Area
Okaloosa County West Service Area
Mary Esther Service and Franchise Area
Ft. Walton Beach Service and Franchise Area
Destin Water Users Service and Franchise Area
Okaloosa County Island Service Area
Santa Rosa County
Walton County
Eglin Air Force Base
Choctawhatchee Bay
Gulf of Mexico
Blackwater River
Yellow River
Shoal River
Titi Creek
Miles
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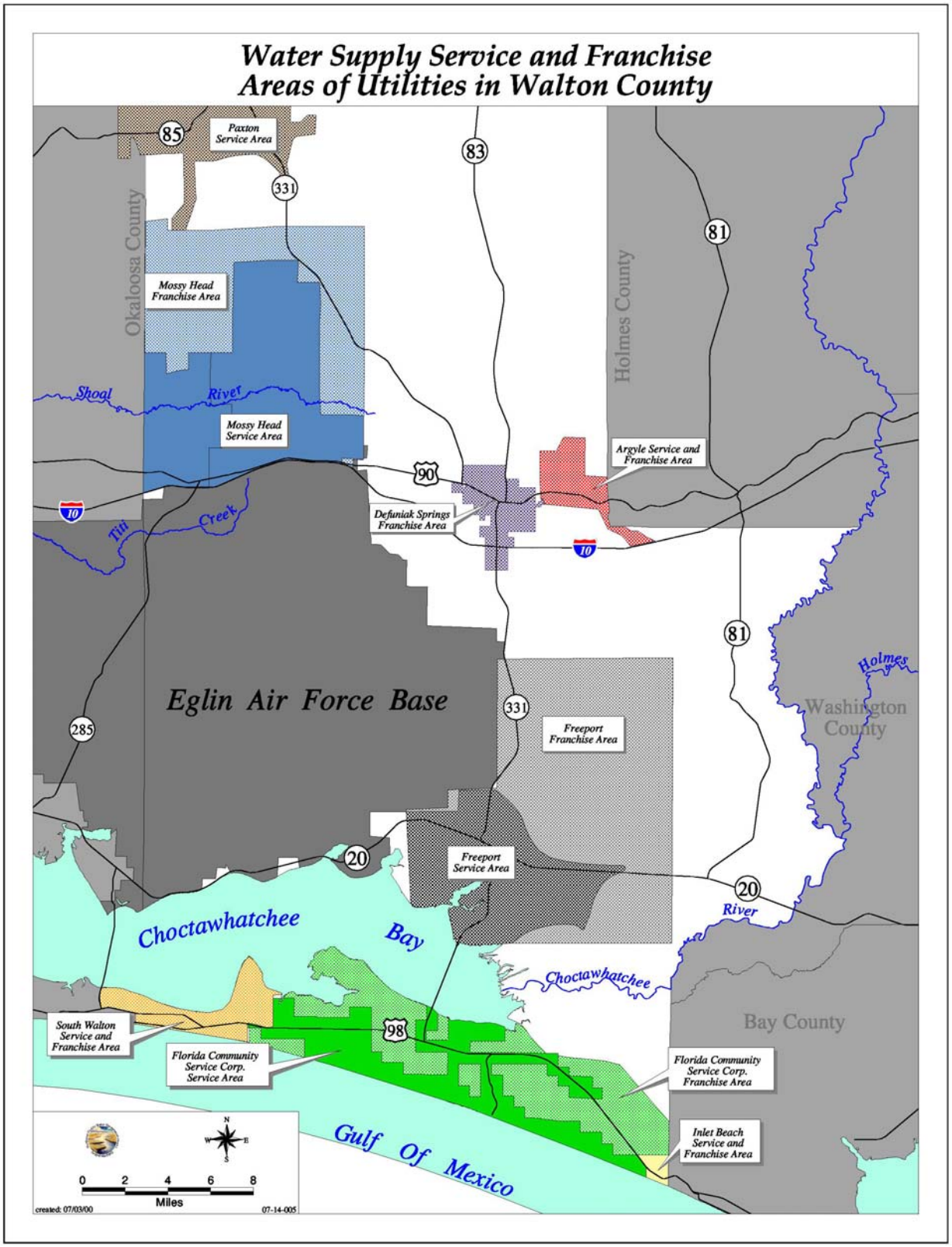
Water Supply Service and Franchise
Areas of Utilities in Walton County
Paxton
Service Area
Okaloosa County
Mossy Head
Franchise Area
Mossy Head
Service Area
Shoal
River
Tiin
Creek
Defuniak Springs
Franchise Area
Argyle Service and
Franchise Area
Holmes County
Eglin Air Force Base
Freeport
Franchise Area
Freeport
Service Area
Choctawhatchee
Bay
Choctawhatchee
River
Holmes
Washington
County
Bay County
South Walton
Service and
Franchise Area
Florida Community
Service Corp.
Service Area
Florida Community
Service Corp.
Franchise Area
Inlet Beach
Service and
Franchise Area
Gulf Of Mexico
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Appendix B. Water Demand Projections, NWFWMD 2003 Water Supply Assessment Update

Santa Rosa County Water Demand & Population Projections (2005-2025)							
Average Daily Flow (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Water Use Category							
Public Supply	11.74	14.62	16.45	18.81	21.24	23.91	26.85
Domestic SS/Small Public SS	0.76	0.81	0.92	1.03	1.15	1.27	1.39
Commercial-Industrial SS	6.20	5.58	6.70	7.20	7.70	8.20	8.70
Recreational Irrigation	1.54	1.45	1.63	1.81	1.99	2.17	2.44
Agricultural Irrigation	0.21	0.34	0.36	0.40	0.43	0.47	0.50
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**20.45**	**22.80**	**26.06**	**29.25**	**32.51**	**36.02**	**39.88**
Large Public Supply System Water Use							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Total population (BEBR)	96,091	117,743	134,100	150,500	167,300	184,600	201,600
Pop. Srv. Public Supply		110,108	125,404	140,741	156,451	172,630	188,527
Pop. Srv. Domestic SS		7,635	8,696	9,759	10,849	11,970	13,073
Average Daily Flow of Large Public Supply Systems (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Gulf Breeze	0.79	1.07	1.36	1.59	1.81	2.04	2.27
Holly Navarre	1.48	2.02	2.33	2.50	2.58	2.62	2.64
Midway	0.71	1.40	1.40	1.86	2.46	3.27	4.33
South Santa Rosa	0.79	0.81	0.90	0.94	0.98	1.02	1.07
Navarre Beach	0.38	0.28	0.30	0.30	0.30	0.30	0.30
Bagdad/Garcon	0.39	0.49	0.60	0.74	0.90	1.08	1.29
Berrydale	0.21	0.19	0.23	0.26	0.29	0.33	0.37
Chumuckla	0.27	0.27	0.34	0.41	0.49	0.58	0.69
East Milton	0.77	1.10	1.42	1.73	2.04	2.35	2.63
Jay	0.28	0.21	0.27	0.27	0.28	0.29	0.29
Milton	1.98	2.15	2.34	2.56	2.78	3.02	3.27
Moore Creek/Mt. Carmel	0.31	0.35	0.35	0.39	0.42	0.46	0.50
Pace	2.72	3.39	3.65	4.17	4.69	5.20	5.72
Point Baker	0.66	0.89	0.96	1.09	1.22	1.35	1.48
Total	**11.74**	**14.62**	**16.45**	**18.81**	**21.24**	**23.91**	**26.85**

Okaloosa County Water Demand & Population Projections (2005-2025)							
Average Daily Flow (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Water Use Category							
Public Supply	21.20	23.05	24.68	26.94	29.63	32.84	36.51
Domestic SS/Small Public SS	1.86	1.27	1.37	1.46	1.55	1.65	1.74
Commercial-Industrial SS	3.97	4.15	5.18	5.99	6.16	6.34	6.52
Recreational Irrigation	2.62	3.89	4.07	4.43	4.70	4.97	5.24
Agricultural Irrigation	1.23	0.20	0.21	0.24	0.25	0.28	0.30
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**30.88**	**32.56**	**35.51**	**39.06**	**42.29**	**46.08**	**50.31**
Population Estimates							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Total population (BEBR)	162,707	170,498	183,300	195,900	208,500	221,300	233,700
Pop. Srv. Public Supply		158,504	170,405	182,119	193,833	205,732	217,260
Pop. Srv. Domestic SS		11,994	12,895	13,781	14,667	15,568	16,440
Average Daily Flow of Large Public Supply Systems (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Destin	2.83	3.40	3.75	4.29	4.90	5.61	6.41
Ft. Walton Beach	3.29	3.22	3.13	3.21	3.42	3.76	4.22
Niceville	2.80	2.95	3.38	3.73	4.08	4.43	4.78
Seminole Community	0.11	0.10	0.10	0.10	0.10	0.10	0.10
Valparaiso	0.62	0.71	0.76	0.82	0.89	0.95	1.02
Mary Esther	0.77	0.64	0.69	0.68	0.67	0.66	0.65
OCWS Main Water System	5.19	5.35	5.31	5.38	5.53	5.82	6.39
OCWS Bluewater-Raintree	1.03	1.13	1.27	1.47	1.72	2.02	2.16
OCWS West	0.56	0.64	0.87	1.03	1.23	1.45	1.72
Auburn	1.11	1.24	1.43	1.67	1.95	2.27	2.66
Baker	0.16	0.22	0.25	0.31	0.37	0.45	0.54
Crestview	2.04	2.48	2.65	2.98	3.32	3.66	3.99
Holt	0.09	0.11	0.14	0.18	0.24	0.31	0.40
OCWS Mid-County	0.33	0.59	0.63	0.74	0.84	0.95	1.05
Milligan	0.14	0.14	0.17	0.19	0.20	0.22	0.23
Laurel Hill	0.13	0.13	0.15	0.16	0.17	0.18	0.19
Total	**21.20**	**23.05**	**24.68**	**26.94**	**29.63**	**32.84**	**36.51**

Walton County Water Demand and Population Projections (2005-2025)							
Average Daily Flow (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Water Use Category							
Public Supply	4.33	7.30	7.74	9.34	10.97	12.63	14.34
Domestic SS/Small Public SS	0.52	0.17	0.20	0.22	0.25	0.28	0.30
Commercial-Industrial SS	1.60	0.92	1.60	1.60	1.60	1.60	1.60
Recreational Irrigation	1.27	0.45	0.54	0.54	0.63	0.72	0.81
Agricultural Irrigation	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**7.77**	**8.89**	**10.13**	**11.75**	**13.50**	**15.29**	**17.11**
Population Estimates							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Total population (BEBR)	33,415	40,601	47,400	53,700	60,200	66,800	73,300
Pop. Srv. Public Supply		39,024	45,559	51,614	57,862	64,205	70,453
Pop. Srv. Domestic SS		1,577	1,841	2,086	2,338	2,595	2,847
Average Daily Flow of Large Public Supply Systems (Mgal/d)							
	1995	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
Freeport	0.29	0.42	0.48	0.58	0.68	0.78	0.89
Inlet Beach	0.06	0.10	0.13	0.17	0.24	0.32	0.41
Regional Utilities	0.72	2.31	2.82	3.76	4.70	5.64	6.58
North Bay Water Co.	0.12	0.14	0.15	0.16	0.17	0.18	0.19
South Walton	1.80	2.42	2.55	2.92	3.28	3.64	4.01
Argyle	0.06	0.09	0.08	0.08	0.08	0.08	0.09
DeFuniak Springs	1.00	1.46	1.19	1.28	1.38	1.47	1.56
Mossy Head	0.08	0.16	0.16	0.21	0.26	0.34	0.43
Paxton	0.20	0.20	0.18	0.18	0.18	0.18	0.18
Total	**4.33**	**7.30**	**7.74**	**9.34**	**10.97**	**12.63**	**14.34**

BIBLIOGRAPHY AND REFERENCES

Baskerville-Donovan, Inc. and Camp Dresser & McKee, Inc. *WRP, Inc. Lower Floridan Aquifer Test Well Program Results (vol. 1 of 2) Okaloosa County, Florida.* 1997.

Barrett, Daffin and Carlan, Inc. *Regional Water Supply Development Plan (Engineering and Financial Feasibility Study for Coastal Areas of Escambia, Santa Rosa, Okaloosa, Walton and Bay Counties, Florida).* Northwest Florida Water Management District. Tallahassee, Fl., 1982.

Bureau of Economic and Business Research (BEBR). *1998 Florida Estimates of Population.* Gainesville: University of Florida Press, 1998.

Bureau of Economic and Business Research (BEBR). *Florida Statistical Abstract. Gainesville:* University of Florida Press, 1999, 2003.

Bureau of Economic and Business Research (BEBR). *2002 Florida Estimates of Population.* Gainesville: University of Florida Press, 2003.

Carlan Consulting Group/Post Buckley Schuh and Jernigan. *Preliminary Planning Report, Santa Rosa County Regional Water System,* Pensacola, FL., 1995.

CH2M HILL. *"Technical Memorandum D.1.B, Brackish Water Source Identification and Assessment, Task D, Development of Lower Quality Water Sources, Alternative Water Supply Strategies in the St. Johns River Water Management District."*

CH2M HILL/SJRWMD. *"Water Supply Needs and Sources Assessment, Alternative Water Supply Strategies Investigation, Planning Level Cost Estimates, Development of Surface Water Supply."* Special Publication SJ97-SP15, 1997.

Clabaugh, B. D. "*Screening of Feasibility of ASR Using Sand and Gravel Source Water in the Floridan Aquifer*" (Internal Memo) Northwest Florida Water Management District. Tallahassee, FL., 1999.

Fabre Engineering, Inc., *Preliminary Report-Water System Analysis of the Navarre Beach Water System*, Santa Rosa County Board of County Commissioners, 1994.

Fabre Engineering, Inc. and Baskerville-Donovan, Inc. *Preliminary Engineering Report-Regional Water Supply System, City of Gulf Breeze, Holley-Navarre Water System, Inc., and Midway Water System, Inc., 1998.*

Fielder, T., deHaven-Smith, L. *Almanac of Florida Politics 2000.* Florida Institute of Government. Tallahassee, FL., 1999.

Grubbs, J.W. "*Ground-Water Recharge in Escambia and Santa Rosa County, Florida."* US Geological Survey, Water Resource Investigations, Report 94-4179. Tallahassee, FL., 1995.

Harbaugh, A.W. *A Computer Program for Calculating Subregional Water Budgets Using Results from the US Geological Survey Modular Three-Dimensional Finite-Difference Ground-Water Flow Model.* US Geologic Survey, Open-File Report 90-392, Reston, Va., 1990.

Harbaugh, A.W., McDonald, M.G. *Programmer's Documentation for MODFLOW-96, an update to the US Geological Survey Modular Finite-Difference Ground-Water Flow Model.* US Geologic Survey, Open-File Report 96-486, Reston, Va., 1996.

HydroGeoLogic, Inc. *Modeling of Ground Water Flow in Walton, Okaloosa and Santa Rosa Counties, Florida.* Prepared for Northwest Florida Water Management District. 2000.

HydroGeoLogic, Inc., Saltwater Intrusion in the Floridan Aquifer in Walton, Okaloosa, and Santa Rosa Counties, Florida, Western Model Domain Final Report. Prepared for Northwest Florida Water Management District, 2005.

Marella, R.L, Mokray, M.F., Hallock-Solomon, M. *Water Use Trends and Demand Projections I the Northwest Florida Water Management District.* US Geological Survey, Open-File Report 98-269, Tallahassee, FL., 1998.

Moss, C., deBodisco, C. *"Projected Water Demand by Agriculture in the Northwest Florida Water Management District."* Economic Information Report. University of Florida Food and Resource Economics Department, Gainesville, Fl., 1998.

Northwest Florida Water Management District. *District Water Management Plan.* Havana, FL., 1994.

Northwest Florida Water Management District. *District Water Supply Assessment.* Havana, FL., 1998.

Northwest Florida Water Management District. *District Water Management Plan Update.* Havana, FL., 2000.

Northwest Florida Water Management District. *Regional Water Supply Plan for Santa Rosa, Okaloosa, and Walton Counties* Water Resources Assessment July 2000 (Adopted February 22, 2001). Havana, FL., 2000.

Northwest Florida Water Management District. *Water Supply Projections: 2005-2025.* Water Resources Assessment 2003-01. Havana, FL., 2003.

Northwest Florida Water Management District. *District Water Management Plan Update.* Havana, FL., 2005.

PBS&J. 2006. Conceptual Alternative Water Supply Development Projects and Planning Level Cost Estimates: Water Supply Planning Region II. Final Report, September 2006.

PBS&J. (a) Fre*sh Ground Water Development Task Summary Report.* Prepared for Northwest Florida Water Management District. 2000.

PBS&J. (e) "*Planning Level Analysis of Surface Water Treatment Requirements—Sub Task 5.2" (Technical Memo).* Prepared for Northwest Florida Water Management District. 2000.

PBS&J. (d) *Reuse Task Summary Report.* Prepared for Northwest Florida Water Management District. 2000.

PBS&J. (b) *Water Transport Task Summary Report.* Prepared for Northwest Florida Water Management District. 2000.

PBS&J. (c) *Water Conservation Task Summary Report.* Prepared for Northwest Florida Water Management District. 2000.

PBS&J/SJRWMD. *Cost Effectiveness of Evaporative Treatment Processes*. Prepared for St. Johns River Water Management District 1996.

Ryan, P. L., Macmillan, T.L., Pratt, T.R., Chelette, A.R., Richards, C.J., Countryman, R.A., Marchman, G.L. *District Water Supply Assessment.* Northwest Florida Water Management District. Havana, FL., 1998.

Smajstrla, A.G. *Agricultural Field Scale Irrigation Requirements Simulation Model: Technical Manual.* University of Florida Agricultural Engineering Department. Gainesville, FL., 1986.

Southwest Florida Water Management District. *Regional Water Supply Plan (Draft).* July, 2000.

Vecchioli, J., Tibbals, C.H., Duerr, A.D., Huthinson, C.B. *Ground-Water Recharge in Florida—A Pilot Study in Okaloosa , Pasco and Volusia Counties.* US Geological Survey. Water Resources Investigations Report 90-4195, 1990.

Vergara, B. *Final Report: 1-in-10 Year Drought Requirement in Florida's Water Supply Planning Process.* Prepared by 1-in-10 Year Drought Subcommittee of the Water Planning Coordination Group, 1998.

West Florida Regional Planning Council (WFRPC). *Water Conservation and Reuse Enhancement Program for the Coastal Areas of Santa Rosa, Okaloosa, and Walton Counties (Final Report).* Pensacola, FL., 1999.