

PALM BEACH CIVIC ASSOCIATION

Water Resources Demand Preliminary Analysis



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9:30 a.m.

Background and Purpose

- **Town Council Considering Ways to Ensure Adequate Water Availability and Quality**
- **To Date, Several Options Advanced for New / Additional Water Supplies**
- **Certain Options Entail Huge New Long-Term Capital Obligations**
- **Economic Feasibility of Each Option a Function of Forecasted Usage**
- **Possible Opportunity to Conserve Water and Reduce Future Expenditures**
- **Therefore, the Palm Beach Civic Association Has Been Addressing 2 Demand-Side Issues:**
 - **What Should Our “Baseline” Usage Be?**
 - **What Conservation Methods Are Most Powerful and Practical?**

Agenda



- **Water Usage Data**
- **Water Conservation Measures & Potential Savings**
- **Rate Comparisons**
- **Preliminary Conclusions**
- **Scope of Recommendations**
- **Next Steps and Open Discussion**

Water Usage*

*Data Based on Actual Water Bills
In the Town of Palm Beach

Caveats

- WPB Usage Misclassifications
 - Many single residential in “commercial”
 - Many single residential in “multi-residential”
 - Many “multi-residential” in “commercial”
- Usage Analyses Disregard Fixed Charges and Taxes
- Rate Comparisons Not Always Apples and Apples
 - Sewage in some rates and not others
 - Different years

Monthly Usage Statistics Oct 2007-Sept. 2008

*The Median Single-Family Residence
Uses Over 800 Gallons / Day*

	<u>Accts</u>	<u>Usage</u> <u>%</u>	<u>Avg</u> <u>kgal</u> <u>/Acct</u>	<u>Avg</u> <u>\$/Acct</u>	<u>Median</u> <u>\$/Acct</u>	<u>Avg</u> <u>Gal/day/</u> <u>Acct</u>	<u>Median</u> <u>gal/day/</u> <u>Acct</u>
<u>MULTI-RESIDENTIAL</u>	265	23%	159	\$600	\$200	5,299	1,550
<u>GENERAL/COMMERCIAL</u>	519	19%	65	\$304	\$56	2,175	297
<u>SINGLE RESIDENTIAL</u>	<u>2,589</u>	<u>58%</u>	40	\$141	\$73	1,343	<u>806</u>
<u>GRAND TOTAL ACCOUNTS</u>	3,373	100%	53	\$202	\$77	1,782	780

Annual Usage

*Water Restrictions Have
Reduced Town Usage By 30%*

<u>FY07-FY08</u>	<u>FY05-FY06</u>	<u>FY11-FY12</u>
<u>(actual)</u>	<u>(actual)</u>	<u>(as projected By WPB)</u>
<u>CCF/Year</u>	<u>% Change</u>	<u>% Change</u>
2.9 million	-30.0%	4.4%

Gallons/Day

6 million	8.4 million	6.1 million
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Billings/Year

\$8.2 million	n.a	???
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Average Monthly Water Usage FY07-FY08

*Single-Residence Usage Varies Widely
Even Among Similar Properties*

<u>Example House #</u>	<u>CCF</u>	<u>Kgal</u>	<u>\$ BILLED</u>
100	24	18	\$55.00
101	28	21	\$58.00
102	31	23	\$74.00
103	49	37	\$110.00
104	52	39	\$123.00
105	51	38	\$138.00
106	68	51	\$163.00
107	78	59	\$208.00
108	90	67	\$215.00
Average	52	39	\$127.11
Normalized Savings	79	56	\$127.67
% Savings	16.8%	15.8%	11.2%

Average Monthly Water Usage FY07-FY08

Example House	CCF	Kgal	\$ BILLED
200	11	8	\$25.08
201	14	11	\$29.49
202	20	15	\$41.54
203	22	17	\$42.82
204	23	17	\$45.26
205	22	16	\$45.52
206	26	20	\$52.57
207	29	22	\$59.43
208	30	23	\$62.77
209	33	24	\$65.59
210	33	24	\$65.62
211	35	26	\$71.39
212	41	30	\$85.01
213	42	32	\$90.38
214	45	33	\$92.76
215	39	29	\$99.40
216	44	33	\$101.82
218	47	35	\$112.22
217	40	30	\$123.10
218	71	53	\$175.57
Average	33	25	\$74.37
Normalized Savings	103	77	\$188.80
% Savings	15.5%	15.5%	12.7%

*Different Part of Town:
Single-Residence Usage
Varies Widely Even
Among Similar Properties*

SAMPLING OF MULTI-RESIDENTIAL USAGE FY07-FY08

Multi-Residence Usage / Unit Also Varies Widely

<u>Identity</u>	<u># of Units</u>	<u>Avg Gal/day/ Unit</u>	<u>Comments</u>
South Ocean*	3,416	141	Roughly 50 Entities
All Other	2,547	364	Condos, Co-Ops Town Houses
Example #1	14	122	Only minor landscaping
Example #2	29	607	Tennis court & large pool
Example #3	15	585	Extensive lawn area
*Correlation of -0.33 between number of units/development and usage/unit			

Water Conservation

CONSERVATION MEASURES--OUTDOOR

➤ Planting Materials

- Less Lawn
- Drought-resistant lawn, shrubs & ground cover
- Proper Mulching

➤ Irrigation

- Drip Irrigation
- Rain Gauges
- Smart Controllers [Example HydroPoint]
- No Leaks

➤ Pool / Spa

- Covers
- More Selective Heating

Irrigation--Timers vs. Smart Controllers

- Timers: 1960s Technology - Inefficient
- Smart Controllers: Newest Technology
 - Weather Driven Program - Daily Downloaded Ground Moisture Updates
 - Temperature
 - Humidity
 - Wind
 - Solar Radiation
 - Compatibility - Plug-Compatible With Existing Controllers
 - Scalable - Range of Sizes & Configurations Available
 - Residential
 - Multi-Residential / Commercial
 - Custom Installation - Parameters Based on Unique Property Characteristics / Zones
 - Adaptable – Rain Gauges, Restricted Watering, Power Outages

CONSERVATION MEASURES-OTHER

➤ Indoor

- Low-Flush Toilets
- Shorter Showers & Reduced-Flow Showerheads
- Low-Usage Clothes Washers
- Leaky Faucets & Toilet Repair
- Hot Water Recirculation Or On-Demand

➤ General

- System Leakage
- Accurate Metering

➤ More Advanced

- Rain Catchment
- Private Wells
- Separate Non-Potable Common Source
- Recycling

Important Rules of Thumb

*Indoor Use Should Only Account For
100-150 gallons / day / household*

<u>Usage Category</u>	<u>Value</u>	<u>Unit</u>
Indoor/potable	40-60	Gal./Day/Person
Lawn irrigation	100-105	Gal./Day/1000 sq. ft.
Shrubbery & Ground Cover	65-70	Gal./Day/1000 sq. ft.
Water Conserving Plants	45-50	Gal./Day/1000 sq. ft.
Source: Waterbudgets.com Water Use Calculator for Zip Code 33480		

APPLYING THE RULES OF THUMB

“Sample Household” Lot 18,000 sq. ft.

Based on Rules of Thumb, Most Single Residences Could Reduce Usage Markedly

Usage Category	Gallons/Day		% Usage Savings	Potential \$ Annual Savings**
	Predicted Value*	Actual Value (est.)		
Indoor/potable	164	n.a.		
Lawn irrigation	309	n.a.		
Shrubbery & Ground Cover	230	n.a.		
Water Conserving Plants	94	n.a.		
Sub Total	797	1,537		
Pool Evaporation Allowance	n.a.	<u>-74</u>		
Total Not Including Pool	797	1,463	46%	\$956
*Source: Waterbudgets.com Water Use Calculator for Zip Code 33480				
**Based on current rates				

Rate Comparison – Single Family Residences

Other Water-Use-Sensitive Jurisdictions Use Rates To Discourage Excessive Use

			Town	Average Monthly Bill			
<u>Usage Level</u>	<u>Gal. Day</u>	<u>CCF/ Month</u>	<u>Perc-entile</u>	<u>PB/ Town</u>	<u>Sara-sota</u>	<u>Marin *</u>	<u>Tucson</u>
Very High	2,800	112	90%	\$335	\$902	\$801	\$805
High	1,700	69	80%	\$160	\$492	\$389	\$421
Town Median	800	31	50%	\$73	\$125	\$91	\$115
Florida Median	200	8	10%	\$21	\$29	\$22	\$20

*Assumes winter months usage at 30% of summer usage before proposed increase

Conservation Potential

- Revert to mean--15%-20%
- Case studies--20%-50%
- Rules of thumb examples--40%+
- Marin experience--30%-50%
- Town Restriction Experience--20%-40%*

*Reduction in FY07-FY08 Usage versus FY05-FY06

Preliminary Conclusions

- *Residential Use Accounts for >80% of Total*
 - *Single – 58%*
 - *Multi – 23%*
- *Our Single-Residence Usage Exceeds Nationwide Norms*
- *Roughly 80% of Our Single-Residence Usage Is For Irrigation*
- *Usage Is Sensitive to Restrictions, Rates and Conservation Practices*
- *New Technology Can Materially Reduce Water Use*
- *Other Conservation Practices Have Also Worked Elsewhere*
- *Conservation Is Our Strongest Means to Minimize Capital Expenditures for New Water Sources*
- *But, Wholesale Reduction of Demand Will Not Necessarily Reduce Customer Bills*

Scope of Recommendations

- Means to Reduce Usage
 - Smart Irrigation Controller Program
 - Usage Audits & Direct Assistance
 - Financial Incentives
 - Rate Surcharges
 - Education – Meetings, Materials
 - Tougher Codes and Policing
 - ARCOM
 - Inspections
 - Fines
- Usage Reduction Forecast

Stakeholders

- Town Residents
- Town Businesses
- Town Government: Public Works, Finance & Administration
- City of West Palm Beach
- South Florida Water Management District
- EPA

Potential Next Steps



- **Validate Usage Savings Potential**
- **Review Smart-Controller Options & Cost / Benefits**
- **Establish Potential Elasticity of Demand**
- **Review Existing Town Ordinances / Codes**
- **Assemble Conservation Ideas and Materials**
- **Recommend a Conservation Program**
- **Forecast Demand**