OVERVIEW
# UC STEP-WISE CHRONOLOGY
(mid-July, 2005 through mid-January, 2007)

## Plans, Studies, and Presentations

<table>
<thead>
<tr>
<th>Plan/Strategy</th>
<th>Date</th>
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<tbody>
<tr>
<td>Existing Infrastructure</td>
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<tr>
<td>Water T&amp;D System</td>
<td>10/2005, 12/2005</td>
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<tr>
<td>Electric T&amp;D</td>
<td>5/2006</td>
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<tr>
<td>Growth Infrastructure</td>
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<td>Bright T&amp;D System</td>
<td>32006, 8/2006</td>
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<tr>
<td>Cost of Service</td>
<td>3/2006</td>
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<td>5&amp;10 Year Capital Improvement</td>
<td>3/2006</td>
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Events Recap (1-16-07)

• In May, 2005, the City requested that the UC I-95 landholdings be sold.

• A comprehensive strategic initiatives plan for the UC was developed and implemented in November, 2005, and updated in November, 2006.

• Assessments and remediation of existing infrastructure and of resultant growth impacts were completed and presented through 6 comprehensive formal reports, listed in projects, and included in plans beginning in December, 2005, and continuing through the current time.

• A comprehensive cost of service study was conducted and implemented.

• 5- and 10-year capital improvement plans were developed and submitted.

• Serious IT security issues were corrected.

• Growth infrastructure policy and and funding requirements regarding SB 360 were implemented in July, 2006.

• After $13 million in total losses, telephone and cable operations were terminated on 9-1-06.

• In December, 2005, TECO electric power contracts were secured and were not as advantageous as the then terminating Progress Energy contract.

• A year 2000 $13 million generation investment provides uneconomic energy at 25 cents/kwh (@$2/gallon fuel).

• Electrical transmission system congestion in central Florida resulted in termination of TECO supply and resulted in expensive fuel and purchase power during peak summer periods in FY 2006.

• $43 million in WAV master plan proposed allocations to NSB would not have provided timely, if ever, water for NSB and, consequently, the UC requested that NSB exit from the WAV Interlocal Agreement.

• A formal water harvesting/electrical generation RFQ was solicited in April, 2006, and received minimal interest.

• UC irrigation water supplies are expected to be exhausted within three years at a build rate of 125 units/month.

• Contentious and protracted local investigations and State criminal investigations of previous UC administrations were ended and a Federal appeal was requested by the UC through its legal counsel.
WATER SUPPLY STRATEGIES 2007-2016

• Enhance conservation through policy, education, conservation devices, developer-builder options, and rate structure.

• On existing UC property, develop draught tolerant alternate source employing non-potable/potable sources (up to 5mgd) employing surficial wells and/or multiple deep saline acquifer wells for withdrawal and/or injection to supply non-potable pond storage or potable supply piped to Glencoe.

• Secure up to (5mgd) of local water co-product generation, local private ownership with a UC purchase option or local partnership contract.

• Enhance local interconnection plans to include remote status and operation.

• Incorporate emergency potable water processing capability.
### WAV Summary SJRWMD CUP Allocation Table

#### Table ES-1
**Projected 2025 Water Supply Deficits**

<table>
<thead>
<tr>
<th>Utility</th>
<th>2025 Demand</th>
<th>2025 CUP Allocation</th>
<th>Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytona Beach</td>
<td>20.54</td>
<td>16.16</td>
<td>4.38</td>
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<tr>
<td>Edgewater</td>
<td>3.43</td>
<td>2.48</td>
<td>0.95</td>
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<tr>
<td>Holly Hill</td>
<td>1.88</td>
<td>1.56</td>
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<tr>
<td><strong>New Smyrna Beach</strong></td>
<td><strong>7.83</strong></td>
<td><strong>8.33</strong></td>
<td><strong>-0.50</strong></td>
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<td>Ormond Beach</td>
<td>10.33</td>
<td>8.96</td>
<td>1.37</td>
</tr>
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<td>Port Orange</td>
<td>9.02</td>
<td>8.97</td>
<td>0.05</td>
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<tr>
<td>East Summary</td>
<td>53.03</td>
<td>46.31</td>
<td>6.55</td>
</tr>
<tr>
<td>DeLand</td>
<td>7.96</td>
<td>6.57</td>
<td>1.39</td>
</tr>
<tr>
<td>Deltona</td>
<td>18.83</td>
<td>13.96</td>
<td>4.87</td>
</tr>
<tr>
<td>Orange City</td>
<td>3.21</td>
<td>2.42</td>
<td>0.79</td>
</tr>
<tr>
<td>Volusia County</td>
<td>13.29</td>
<td>4.75</td>
<td>8.54</td>
</tr>
<tr>
<td>West Summary</td>
<td>43.29</td>
<td>27.7</td>
<td>15.59</td>
</tr>
<tr>
<td><strong>WAV Summary</strong></td>
<td><strong>96.32</strong></td>
<td><strong>74.01</strong></td>
<td><strong>22.14</strong></td>
</tr>
</tbody>
</table>

1. Includes 10% safety factor in demand.
2. CUP allocations effective as of January 2006.
3. CUP allocations carried forward to 2025 for those utilities whose CUP did not extend to 2025. The SJRWMD has indicated it is unlikely CUP allocations will increase in the future.
Available water supply has been discussed at many workshops and meetings beginning in September, 2005 and continues today. Growth and infrastructure studies have presented questions regarding available water supply and distribution sources, especially when considered under drought conditions.

Note: With 16,000+ potential homes already approved, another 3.2 MGDA demand is expected using 2005 performance or 3.5 MGDA using 2004 performance when built.

Daily use of bright water will be exhausted and a 2 MGDA deficiency is expected placing irrigation burden on shallow private wells or potable supply. During current drought, all available bright water has been exhausted.
SHORT-TERM IRRIGATION WATER NEEDS

SUMMARY

• Current build rates ~125 units/month.
• Each unit creates a net deficit in irrigation of 470 gpd.
  (200 gpd X 65% WRP reuse = 130 less 600 gpd irrigation demand = 470 gpd shortfall)
• Irrigation surplus is currently 1,250,000 gpd.
• 2,660 new units will eliminate the surplus.
• @ 125 units/month, in 22 months (or November, 2008) there will be a need for irrigation water.

So, in less than three years, we need a reliable answer.

WHERE DO WE OBTAIN THIS WATER?
Is the UC Land Suitable?
Our Aquifer

The Floridan Aquifer
Note: Depth indicated is total depth of test well. Most wells were backplugged.
Water-Wise Plan Elements

Need:
• Irrigation (Bright Water) supplies will be exhausted in less than three years.

Design Criteria:
• Drought and hurricane tolerant.
• Modular to meet growing demand.
• Supply irrigation or potable demand.
• Portable capability for emergency conditions.
• Cost effective.
• Mitigate risk.

Facility Criteria:
• UC property can supply irrigation quality water to supplement WRP production and pond storage.
• Harvest rain water from the UC I-95 Property—TARGET ~ 1,600,000 gallons/day
• Store, blend, and supplement irrigation water needs from the lower Floridan aquifer—TARGET~2,000,000 gallons/day additional.
• Use appropriate modular (add another unit as needed) water purifying technology to produce irrigation or potable water.
• Interconnect harvest piping systems to lower Floridan storage, irrigation pond, and raw water well systems.

Next Steps (Phase 1):
• Determine test locations.
• Drill ~1200 depth confirmation/monitoring well and evaluate results (~$750k?).
• Install pilot surficial well(s) and evaluate results (~$250k?).
• Examine (through RFQ) non-traditional water sourcing technologies.
• Analyze results for next implementation phase.
Long-Term Reuse Water Needs West Of I-95

~9,500 ERU's remaining to be constructed, excluding commercial areas and golf courses

200 GPD/ERU potable supply=1,900,000 gallons per day
   Recovery of 65% of potable for Bright Water Use or 1,235,000 available
   Approximately 1,250,000 is currently available from existing system
   Total Bright Water available ~2,485,000 gpd

600 GPD/ERU required for irrigation or 5,700,000 gallons per day for the Western area alone

~3,815,000 gallon per day shortfall expected

Surficial (horizontal) wells may harvest 1-5 gpd/foot of well. Using 2.5 gpd,
1,526,000 feet of well piping or 289 miles to harvest 3.8 mgd.

**EXCEPT THAT:**
   2,710,369 gpd is the maximum available, if 100% rainfall recovered.

EXAMPLE ONLY
I-95 Land Water Harvesting Potential Estimate

One gallon – 231 cubic inches
Average NSB rainfall = 48 inches/year
43,560 square feet/acre
144 cubic inches/square foot with 1 (one) inch of water
UC I95 area land = 759 acres (unverified 436 wet-323 high lands)
UC land is in a 4-8 inch/year aquifer recharge zone making it a poorer recharge area

• Calculation: 759 acres X 43,560 square feet X 144 cubic inches X 48 inches rain = 228,524,820,480 cubic inches/231 cubic inches = 989,284,937 gallons per year/365 days = 2,710,369 gpd max

• If a 60% rainfall water harvest rate is achieved, ~1,626,000 gpd is available for potable or irrigation potentially to be blended 100% with the lower Floridan water producing 3,250,000 gpd.

• Seawater harvesting may cost an additional $1.8-3.5 Mil/year.
Land Profile Calculation Estimate

829 acres less 160’ FP&L easement, potential 130’ Williamson Blvd, and FP&L 230 kV transmission substation = ~759 acres.

Market Perspective:
• FMPA loan remaining debt $8.1 Mil (9-30-2020) $689,025 (P&I) (~$6.2Mil forecasted for year-end)
  • @ $25k/acre X 759 = $18,975,000 (Volusia Property Appraiser 2007 @ $10k/acre)
    $1,618,772 tax potential for $400 million base (4.04693 mills/sale or lease)
    $6 Mil (UC Developer agreements 1139 ERU’s) and other CIAC
      Economic multiplier 3:1
  • Commercial/Residential Development—highland potential environmental contamination affecting water harvesting.

EXAMPLE ONLY
Land Profile Calculation Estimate (cont’d)

Resource Perspective:

• 436 acres wetland mitigation credits? @ ~$25k/acre? ($10.9 Mil)
• 2-20? MW Renewable Bio Plants (@$60Mil plant/$1.5Mil, $249k tax) Electric risk $2 Mil/yr use
  11,638 mmbtu (1,280 tons)/day using ~9,500 btu/kwh heat rate, LP boiler (traditional).
  Current controllable biomass can produce ~5 MW. Environmentally must be
  compatible with water harvesting concept. Non-traditional thermal sources may be
  more efficient and would be evaluated.
• 323 acres (highland) lease @ ~$??k/acre biofuel sand/slash pine forest 10-year cycle 288,000
  mmbtu/yr or 819 mmbtu/day (90 tons) @$2/mmbtu = ~$597k/yr fuel cost avoidance.
• City tipping Fees for bio solid waste ~$750k/yr--57 tons/day or 520 mmbtu/day.
• Additional needed bio solid waste fees and fuel stock ~1,100 tons/day. Hog fuel or waste water
  plant solids may become fuel.
• 3 Acres for 3MG reuse storage tank-- ~$300k cost avoidance
• @ $1.00/1000 net, irrigation water $2,372,500 (6%--~$145k)
• Economic multiplier from plant 7:1
• FPL Transmission Substation (~$12 Mil = $49k taxes)
• Renewable generation Carbon Tax value??
• Retain Highlands Land Value and augment with other alternative water harvesting technologies.

EXAMPLE ONLY
This land was acquired by eminent domain for “public use.”

- Most of the land area will be used to secure our future potable and irrigation water sources.

- Water Harvesting will be accomplished in the magenta areas and stored in the lower (or upper in some cases) Floridan aquifer.

- Water harvesting processing will occur in the central rectangle area with the addition of a private lease purchase renewable power plant using the yellow for fuel laydown.

- Proposed FP&L 230 kV substation.

- Williamson Blvd through connector along west property line.

New Potable Well locations and harvested raw water will be connected by manifold piping to Glencoe. Harvested irrigation water will be manifolded to the storage pond or bright water mains as appropriate. Based upon performance, refinements to water sourcing needs are adjustable.
Energy-Wise Plan Elements

• Conservation Pilot Assessment
  • General
    • Energy conservation education
    • Customer consultation
    • Capacity RFP
    • RFP purchase power contracts (short/long term)
    • RFP innovative demand-side management programs
    • RFQ energy services companies
    • Solar thermal/electric programs
    • Green building codes, builder, and consultation
    • Rate design incentives
    • Real-time pricing/metering
  • Residential
    • Self-audit materials
    • Conservation surveys
    • Duct leakage repair
    • Weatherization
    • Infared scanning service
  • Commercial
    • Self-audit materials
    • Lighting Service
    • Conservation surveys
    • Infared scanning service
    • Thermal energy systems (geothermal, storage/exchange/recovery, etc.)
• Partnership in Renewable Energy Modular Design Plants on UC land
  • 20 MW power contract with lease/purchase option
  • (Biomass) fuel compatible with water harvesting
  • Water production potential
• Distributed generation.
• Partnership to purchase power from renewable sources interconnected to UC transmission.

EXAMPLE ONLY