Water Conservation and Reclamation as Water Supply Strategies

Presented to
Austin City Council
by
Austin Water Utility

June 8, 2006
The Utility’s Mission

“... provide effective management of our water resources for the community in order to protect the public health and environment.”

• Optimize the use of our available water resources
• Provide a safe and reliable supply of water for community purposes and public safety
• Provide quality wastewater collection and treatment services
• Practice cost efficiency, continuous improvement, environmental responsibility, and customer service
Water Resource Planning

- Water Supply Planning (50 Year Horizon)
- Water Treatment Plant
- Distribution System
- Infrastructure Planning (5-10 year Horizon)
- Demand Management
Integrated Water Resource Planning (IWRP)

- Approach adopted by AWU in early 1990s
- Key concepts
  - Balance demand-side & supply-side approaches to supply & capacity issues
  - Evaluate cost effectiveness
  - Include all direct & indirect costs/benefits of a suite of water resource projects
Role of APAI Study

- Initially conceived as long-range supply study (March 2005)
- Modified to include WTP 4 alternate site evaluation (July 2005)
- Modified to include demand impact of water conservation / reuse on WTP 4 (July 2005)
- Modified to address impact on Green WTP (December 2005)
# Presentation Outline

- Demand Management Past, Present, and Future
- Improved Water Use Efficiency
- Alternate Near-Term Water Supply
- Schedule Considerations
- Action Plan
AWU Historic Water Conservation Programs

- Conservation-oriented water rates
- Leak detection
- Toilet replacement programs (rebates and distribution)
- Clothes washer rebates
- Showerhead distribution
- Irrigation and system audits
- Irrigation system rebates
- Rain shutoff sensor distribution
- Water-wise landscape rebates
- Ice machine rebates

- Rainwater harvesting and rain barrel programs (rebates and incentives)
- Evapo-Transpiration program
- Soil depth initiative
- Special commercial incentives
- Dental/medical dry vacuum rebates
- Car wash certification
- Public and school education
- Municipal programs
Toilet Replacement Programs

- 94,000 toilets retrofitted
  - 18% of old single-family toilets
  - 40% of old multi-family toilets
  - 15% of old commercial toilets
Other Conservation Programs

- 15,000 clothes washer rebates
  - 1 million GPD saved
- 8,500 irrigation audits
  - 1.15 million GPD saved
- 8,400 rainbarrels sold/rebated
- 2.2 million GPD in commercial retrofits
Water Savings Through 2005

• 12.7 million GPD (peak)
  – Nearly 5% of utility-wide capacity

• 13,000 acre-feet per year reduction
AWU Conservation Awards

- U.S. Bureau of Reclamation Long-Term Leadership Award (1995)
- Am. Society of Landscape Architects Honor Award (1995)
- TNRCC State of Texas Honors (1999)
- American Water Works Association, Texas Section
  - “Xeriscape It” Rebate Program (1994)
  - ULF Toilet Outreach Program (1995)
  - WaterWise Irrigation Program (1999)
  - Alternative On-Site Water Sources Program (2002)
  - ET Calculator Irrigation Efficiency Project (2005)
  - Rainwater Harvesting Demonstration Project (2005)
  - 5 Watermark Communications Awards (2002-2005)
- Lower Colorado River Authority Environmental Award (1993)
- 6 IABC Austin Bronze Quill Awards (1996 – 2005) for communications
The Reclaimed Water Plan

- Initial master planning in 1992
- Irrigation and industrial uses city-wide
- Now using about 800 million gallons/year (~2 MGD)
- By 2050: 9,740 million gallons/yr (~27 MGD)
Recently Completed Reclaimed Water Projects

- SAR Pump Station Upgrade
- SAR Elevated Storage Tank
- Jimmy Clay GC Booster Pump Station Control automation
- 51st Transmission Main – RMMA
Historic Peak Demands

- Peak Day Demand (MGD)
- Population (Thousands)

- Historic Peak
- Peak Trend
- Population

Legend:
- Historic Peak
- Peak Trend
- Population

Demand Management Past, Present, and Future
Historic Peak Demands

Peak Day Demand (MGD)


2.7 Yr. Delay in Peak since 1993

- Historic Peak
- Peak W/O Conservation
- Peak Trend
Water Resource Planning Study
Phase A: Demand Management

• Assumed current level of conservation spending continues
• Considered >100 additional programs
• Evaluated 14 programs in Phase A
  – Focused on peak day programs that could be implemented quickly
• Remaining programs to be evaluated in Phase B
## Possible Advanced Demand Management Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Projected Savings (mgd)</th>
<th>Capital Costs</th>
<th>Add’l FTEs</th>
<th>Implementation / Schedule Issues</th>
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</thead>
<tbody>
<tr>
<td>Reduce Lost Water</td>
<td>4.8</td>
<td>Unknown</td>
<td>Yes</td>
<td>Budget, potential outsourcing</td>
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<tr>
<td>MF/ICI 5-day Cycle</td>
<td>3.0</td>
<td>None</td>
<td>Yes</td>
<td>Ordinance, enforcement, budget</td>
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<tr>
<td>Residential Retrofit on Resale</td>
<td>0.7</td>
<td>Private</td>
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<td>Multi Family &amp; Commercial Retrofit</td>
<td>0.9</td>
<td>Private</td>
<td>Yes</td>
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<tr>
<td>Increased Water Rates / 5th Tier</td>
<td>5.3</td>
<td>None</td>
<td>No</td>
<td>Ordinance, billing system, reliability</td>
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</tbody>
</table>
### Possible Advanced Demand Management Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Projected Savings (mgd)</th>
<th>Capital Costs</th>
<th>Add’l FTEs</th>
<th>Implementation / Schedule Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Property Irrigation Audits</td>
<td>1.6</td>
<td>None</td>
<td>Yes</td>
<td>Budget, reliability</td>
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<tr>
<td>Residential Irrigation Audits</td>
<td>0.8</td>
<td>None</td>
<td>Yes</td>
<td>Budget, reliability</td>
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<tr>
<td>Required Multi Family Submetering</td>
<td>0.7</td>
<td>None</td>
<td>No</td>
<td>Ordinance, reliability</td>
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<tr>
<td>Efficient Fixture Standards</td>
<td>3.3</td>
<td>Private</td>
<td>No</td>
<td>Done, rebates can accelerate impact</td>
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<td>Water Reclamation Initiative</td>
<td>4.0</td>
<td>~$12 mil.</td>
<td>No</td>
<td>Budget, customers, construction</td>
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Future Reclaimed Water Projects

- 51st Street Transmission Main – I35
- 51st Street Elevated Storage Tank
- Rehab of abandoned 24” force main
- UT Transmission Main
- ABIA Main
- Hornsby Pressure Improvements
- Balcones Maintenance
Programs Not Recommended for Immediate Implementation

- Mandatory residential 5-day watering cycle
  - Need to maintain ability to manage emergencies
- MF/ICI water budget rates
  - Billing system modification impractical
- Pressure control
  - Requires additional study
- Turfgrass rebate
  - Expensive, time to gain acceptance
- Accelerated reclaimed water
  - Uncertain customer base and construction timing
**AWU Projected Demand/Treatment Needs**

**Demand Management Past, Present, and Future**

- **City of Austin Water Demand and Treatment Capacity Projections**
  - Complete WTP#4 at 50 to 75 MGD by Spring 2015
  - Complete 25 MGD first phase of New Green WTP by Spring 2011*
  - Expand Ulrich to 167 MGD
  - 260 MGD
  - 285 MGD
  - 310 MGD
  - 360 MGD
  - Ten Percent Reserve Capacity Line

*Historical Pumpage

**Peak Day Demand Trendline (Median)**

Years: 2000 to 2026
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Improved Water Use Efficiency

Real loss

Apparent loss

water meter

Improved Water Use Efficiency
FY05 AWU Water Audit Results

- Billed Water (Revenue Water) 84.2%
- Meters 4.4%
- Real Loss 9.3%
- Billing, Theft, Dept. Use 2.1%

AWWA Standard for Well-Run Utility <10% Real Loss
Infrastructure Leakage Index (ILI)

- Real loss / unavoidable loss
  - 12 MGD / 3.6 MGD = 3.33
- ILI target based on:
  - Water supply
  - Operations
  - Financial
- Methodology developed by International Water Association
Plan for Improvement

- Implement enhanced meter testing / repair
- Implement enhanced leak detection / repair
  - Use available technology to detect leaks before they surface
  - Improve repair time once leak is detected by increasing field capabilities
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Alternate Near-Term Water Supply

General Vicinity of Carrizo-Wilcox Proposals

Alcoa Mining Operations

Austin Service Area
Carrizo-Wilcox Aquifer Groundwater Supply Project Issues

• Proposal: Private entity to sell treated Carrizo-Wilcox groundwater to Austin at specified delivery point(s)
• General Location of Supply: Lee County ~ 40 to 50 miles north and east of Austin
• Status: Option being evaluated by Austin as a potential long-range supply
Consideration Items

- AWU would not control schedule.
- AWU would not own the asset.
- Blending issues must be studied.
- New Green estimated cost/1,000 gallons half that of private groundwater proposal.
- Recommendations: Continue to explore and evaluate costs, risks, and benefits.
- Conclusion: Not suitable as a short-term alternative to New Green WTP.
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# Demand Management Implementation Schedule

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tbody>
<tr>
<td>Continue Exist. Programs</td>
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<td>Boards/Commissions</td>
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<td>Stakeholder Input</td>
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<td>Council Briefing</td>
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<tr>
<td>Refine Based on Input</td>
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<td>Ordinance Adoptions</td>
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<td>Imp. Budget Neutral Prog.</td>
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<tr>
<td>Budget for Programs</td>
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<td></td>
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<tr>
<td>Implement Programs</td>
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</tbody>
</table>
New Green WTP – Schedule

Select / Contract Engineer

Prelim Design

Detailed Design

Permitting / Regulatory

Construction

Contractor Bidding and Award

Startup and Contract Closeout

2006 2007 2008 2009 2010 2011 2012

April

Peak Demand Months: June, July, August, and September
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Water Supply Planning Summary

• AWU has done a good job of planning for future
• Demand management is important aspect of IWRP
  – AWU has been a leader in the field
  – Proceed with Board/Commission input on programs
• New Green WTP capacity needed by 2011
  – Need to complete private site selection/acquisition
  – Need to move forward with engineering – 6/22 award
• Monitor demand management successes to determine affect on WTP 4 timing
  – Transmission limitations may need to be addressed if plant is delayed significantly
Questions?