City of Peoria
Water and Wastewater System Optimization

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Deputy Director
Public Works - Utilities
Peoria Water Treatment Facilities

- Quintero WTP
- Twin Buttes WTP (Future)
- Jomax
- Pyramid Peak WTP
- Greenway WTP
- Bell
- Northern
- Carefree Highway
- Lake Pleasant
**Public Water Systems**
Peoria 04-07-096  
Vistancia 04-07-520  
Quintero 04-07-513

**Treatment Plants**
Greenway – 16 MGD  
Pyramid Peak – 11 MGD (Peoria’s share of capacity)  
Quintero – 125,000 gallons per day

**Wells**
40 Production Wells/17 in service  
5 Monitoring Wells

**Distribution System**
779 miles of water mains  
27 storage tanks – 34.6 MG  
33 booster stations  
20,992 valves  
7979 fire hydrants  
356 air release valves  
12 PRV stations
Wastewater System Data

3 Service Areas
- Jomax WRF – 2.25 MGD
- Beardsley WRF – 4.0 MGD
- Butler WRF – 10.0 MGD

Collection System
- 667 miles of main pipes
- 12 Lift Stations including the Butler IPS at 13 MGD capacity
- 15 miles of Force Mains
- 14015 manholes
- 1551 cleanouts

Reclaimed Water System
- 16 miles of main
- 122 valves
- 22 air release valves
- 11 metering vaults
Reorganized Utilities Structure

Deputy Director

- Plant Operations
- Field Operations
- Water Resources & Environmental
Cost Savings Initiatives

- Rate Plan Review
- Employee Cost Savings Workshops
- SRP EnerNOC Program
- APS Peak Solutions
- SRP Spatia Metering Services
- APS Energy Information Services
- Optimization Study
Results of Internal Initiatives

Well Production Electric Cost per 1000 gallons

Greenway Water Treatment Plant Electric Cost per 1000 gallons

* 2009 cost includes additional power requirements for extensive Bromate Mitigation trial
Results of Internal Initiatives

Beardsley Treatment Plant
Electricity Cost per 1000 gallons

- FY07: $0.20
- FY08: $0.40
- FY09: $0.20

Jomax - Combined
Electricity Cost per 1000 gallons

- FY07: $0.80
- FY08: $0.40
- FY09: $0.60
Results of Internal Initiatives

- Employee Cost Savings Workshops
  - Beardsley WRF Savings: $1,500,000 in Capital Costs avoided; $78,000 in annual O&M expenses reduced
  - Jomax WRF Savings: $74,000 in Capital Costs avoided
  - Beardsley WRF: $65,000 in O&M costs reduced
  - Other Areas: $150,000 in O&M costs reduced
Operating Budget Trends
Water and Wastewater Funds

FY 08 Actual  FY 09 Actual  FY 10 Budget

- $5,000,000
- $10,000,000
- $15,000,000
- $20,000,000
- $25,000,000
- $30,000,000
- $35,000,000
- $40,000,000

Wastewater Fund
Water Fund
Optimization Study Objectives

- Study that includes:
  - Water Resource Optimization
  - Treatment Facility Optimization
  - Distribution and Collection System Optimization

- Program Development Report that creates a roadmap to future automated optimization
Optimization Study Goals

Implement low cost changes in operating parameters, protocols and procedures with the goals of:

- Lowering costs with emphasis on energy savings
- Improving water resources management
- Improving or maintaining water quality
Water Resources

2010 – 62,231 ac-ft
- 24% Groundwater
- 76% Surface Water

Buildout – 79,886 ac-ft
- 35% Groundwater
- 65% Surface Water
2010 Water Supply Alternatives

- 1 – Enhanced Groundwater
- 2 – Current Operations
- 3 – Enhanced Surface Water (PPWTP 11 mgd)
- 4 – Maximized Surface Water (PPWTP 11 mgd + 5 mgd)
Water Supply Alternatives

Enhanced Groundwater
Alt 1

Base Case Alt 2

Enhanced Surface Water
Alt 3

Maximized Surface Water
Alt 4

- Groundwater
- Quintero (CAP)
- PPWTP (CAP)
- Greenway (SRP)
Resource Operating Costs

- Resource Costs
- Treatment Costs
- Recharge Costs
- Groundwater Pumping Costs
- Distribution Pumping Costs
## Task 1 Short Term Low Cost Recommendations

<table>
<thead>
<tr>
<th>No</th>
<th>Resource</th>
<th>Year 2010 Recommendation</th>
<th>Annual Savings</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Surface Water</td>
<td>Utilize up to 10,821 ac-ft per year of CAP with 13,312 ac-ft per year of SRP surface water supply and reduce groundwater usage to 7549 ac-ft / year.</td>
<td>$71,800</td>
<td>Immediate</td>
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</table>
# Short Term Low Cost Recommendations (cont’d)

## Distribution System Optimization

<table>
<thead>
<tr>
<th>No</th>
<th>Recommendation</th>
<th>Description</th>
<th>Implementation Costs</th>
<th>Annual Savings</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Utilize More Efficient Wells First</td>
<td>Reduce average power costs 10% from $0.35 / 1,000 gallons to $0.33 / 1,000 gallons</td>
<td>Zero</td>
<td>82,300</td>
<td>Immediate</td>
</tr>
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<td>2</td>
<td>Utilize More Efficient Booster Pump Stations First</td>
<td>Reduce average power costs 10% from $0.07 / 1,000 gallons to $0.063 / 1,000 gallons</td>
<td>Zero</td>
<td>24,500</td>
<td>Immediate</td>
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<tr>
<td>3</td>
<td>Utilize time-of-use power rate</td>
<td>Switch selected sites from flat power rate to time-of-use</td>
<td>Low (programming)</td>
<td>Up to $59,000&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Immediate</td>
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<tr>
<td>4</td>
<td>Staggered time-of-use within zones</td>
<td>Shift some sites TOU 9 am – 5 pm and others 2 pm to 10 pm then stagger operation to minimize-on-peak pumping</td>
<td>Low (programming)</td>
<td>Up to $22,000&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Immediate</td>
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</tbody>
</table>

## Notes:

1. Annual savings are based on historic operation. Implementing resource optimization recommendations that are different from historic operations will vary the annual savings.
2. Distribution system savings are not entirely additive. Implementing selected recommendations will impact savings achievable through implementing other recommendations.
Task 2:
Program Development Report

- Roadmap For Longer Term System Optimization Measures Including:
  - Recommended Implementation of Automated Operations Optimization
    - Water Distribution System Automated Optimization Software
    - Water and Wastewater System Optimization Web Portal
Questions