Wastewater System Expansion Program
Lake Havasu City, Arizona
Lessons Learned

2010 NACE
Western Region County Engineers Symposium
Laughlin, Nevada
November 4, 2010
Lake Havasu City

- Founded in 1964
- Incorporated in 1978
- 3 hour drive to Phoenix
- 2 hour drive to Las Vegas
- Economy: Tourism, Construction, Marine Industry

Population

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>2000</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24,363</td>
<td>41,938</td>
<td>56,000</td>
</tr>
</tbody>
</table>

Build-out Population Estimated at 96,000 in year 2060
• 2,757 Sewer Accounts At Start Of WWSE Program
• Today More Than 20,500
• Approximately 24,000 Total When Completed
In the Beginning….

• Sanitary District Formed in 1964 to serve Commercial and Industrial Areas With 2 Treatment Plants
• Summer of 1994 Beach Closures-ADEQ Investigation
• Wastewater Master Plan Completed in 1998, updated in 2001
• November 6, 2001 $463M Bond Election-Approved by 78% of Voters
• Broke Ground For Construction of First Project September 2002
• September 9, 2003 Proposition 200 (HavaChoice) Soundly Defeated by 86% of voters
$463M Bond Election
- 390 miles gravity main
- 400 miles sewer lateral
- 9,700 manholes
- 24,000 septic tank closures

- 1.1MGD Additional Capacity at Mulberry Treatment Plant
- 3.5MGD North Regional Wastewater Treatment Plant
## Project Statistics

<table>
<thead>
<tr>
<th>WWSE QUANTITIES</th>
<th>WWSE PROGRAM Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity Sewer Mains</td>
<td>274 miles</td>
</tr>
<tr>
<td>Sewer Service Line</td>
<td>286 miles</td>
</tr>
<tr>
<td>New Sewer Manholes</td>
<td>4,250</td>
</tr>
<tr>
<td>Wastewater Pump Stations</td>
<td>30 New</td>
</tr>
<tr>
<td>Sanitary Sewer System Connections</td>
<td>20,649</td>
</tr>
<tr>
<td>WWTP Capacity</td>
<td>4.6 MGD</td>
</tr>
<tr>
<td>R&amp;R Asphalt Paving</td>
<td>4,717,557 Sq. Yards</td>
</tr>
</tbody>
</table>
Lessons Learned

• Engage the Public
  ➢ Bond elections are rarely unanimous
  ➢ Resentment and Criticism Likely Due to Cost
  ➢ Plan for a Public Information Campaign
  ➢ Don’t miss key constituents – residents, general public, council, staff, citizen groups
  ➢ Keep Message Simple, but be Honest
Lessons Learned

• Coordination Is Paramount
  - Public Works Department
  - Finance Department
  - Consulting Firms (Engineering, Financial)
  - Multiple Contractors
  - Private Utilities
  - Mohave County Health Department
  - Arizona Department of Environmental Quality
  - Water Infrastructure Financing Authority
  - EPA
Lessons Learned

• Impact to the Community
  ➢ Limited Construction Prior to WWSE
  ➢ Public Awareness/Relations Campaign
  ➢ Legal Documents – Deeds of Trust vs. Letter of Commitment, Foreclosures
  ➢ Construction Process
  ➢ Traffic Control
  ➢ Database for Residential Issues/Connection Info
  ➢ Private Utilities
Lessons Learned

• Standardization of Process
• ADEQ Certificate of Completion
  ➢ Developed the PECOC Process
• Established Standard Details, and Specifications
• Continual Refinement of Plans and Specifications
• Be Open to Change and Willing to Adjust
Lessons Learned

• Be Flexible
  ➢ Keep Running List of Improvements to Contract Terms
  ➢ Consistency, but Continual Refinement
    • Highlighted Major Changes at Beginning of Contract Documents
    • Contractor Payment Terms
  ➢ Community Tolerances
    • Disruptions – In Havasu < 60 days few calls received
    • Dust
    • Road Closures
Lessons Learned

• Engineering’s Role in Rate Setting
  ➢ More Than Just Projected Capital Costs
  ➢ Timing for Projects – Cash flow, Ramp up time
  ➢ Contingency Amounts
  ➢ Fees based on Meter size or Flat Residential Rate
    ➢ Fire sprinkler requirements and irrigation meters
  ➢ Projections of Water/Sewer Flows
Lake Havasu’s Water Use
Lessons Learned

• Citizen Oversight Role
  ➢ Generally not Technical Experts
    • Find out their background
    • Figure out their motivation and interest/drivers
  ➢ Address their concerns head on and quickly
  ➢ Respect their role
    • Minimize Jargon
    • Documentation for them
    • Justify selection
Oversight Role

• Use Graphics to Explain Points
Oversight Role

• Use a Variety of presentation methods

Review Documentation

Prepare Documentation & Presentation

Presentation To Staff

Council/Oversight Committee Workshop

Work on Long Term Strategies
Oversight Role

- Difference between Planning and Design
Summary

- Original Completion of Program – June of 2013
- Estimated Completion of Program – June 2011
- Original Approved Budget - $463M
- Estimated Final Budget - $348M

WWSE PROGRAM DELIVERY

2-YEARS AHEAD OF SCHEDULE

Over $100M UNDER BUDGET
Questions/Information

Website  WWW.lhcaz.gov

J. Greg Froslie, P.E.
City Engineer
928-453-6660
froslieg@lhcaz.gov

Carmen Kasner
PBS&J
928-855-4505
cckasner@pbsj.com