Our Valuable Water Infrastructure – Challenges of the 21st Century

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Today’s Topics

• Current Status of Our Water Infrastructure – The Facts
• Brief Overview of Asset Management and Its Importance to City Managers
• Update on Arizona’s Water Supply
• Solutions for the 21st Century – Partnering
Our Water Systems – The Facts

- ASCE 2017 Grade Score: D
- 240,000 water main breaks/year
- 1.7–2.2 trillion gallons per year of treated water lost through system leaks
- $0.9B/year of emergency repair
- $1.5M on planned replacement
- $1 trillion backlog to renew water infrastructure
- $8.8 billion of Water loss annually (16%)
Our Systems Are Aging

By 2020, nearly 25% of water distribution systems will be rated as “Very Poor”
Lack of focus on strong asset management to prevent failures
Asset Management – What Is It?

Ensuring that all assets are being maintained in an efficient manner that will ensure lowest whole lifecycle costs

“A Process for Maintaining a Desired Level of Customer Service at the Best Appropriate Cost” (EPA Definition)

Proactive and predictive maintenance and use of diagnostics to minimize service interruptions and failures

A holistic approach for utility systems that provides owners with peace of mind about reliability of their assets
Some Techniques for Proactive Underground Asset Management

- External Inspections
- Internal Visual Inspection
- Sounding
- Leak Detection
- Acoustic Monitoring
- HDCCTV
- Laser Profiling
- Transient Monitoring
- Soil Corrosively Testing
- Sonar Inspection
- Sonde

- Infrared Thermography (IR)
- Electromagnetic Inspection (RFTC and P-Wave)
- Stress Wave Monitoring
- ROV
- Ground Penetrating Radar (GPR)
- Pipe Penetrating Radar (PPR)
- Pipe Coupons (Petrographic)
- Smart Pig
Condition-Based Assessments

**Equipment Name:** Gate upstream of INF Pump #3  **FAN:** 32  **Location:** Headworks  
**Year Purchased:** 2001  **At Risk Rating:** 35%  
**Criticality to Operations:** High X Medium Low  
**Condition:** Excellent X Good Adequate Poor  
**Performance:** Excellent X Good Adequate Poor

**Equipment Name:** Influent Pump #1 Motor  **FAN:** 33  **Location:** Influent Pumps  
**Year Purchased:** 2012  **At Risk Rating:** 76% (Rattle in Top End/Bearing)  
**Criticality to Operations:** X High Medium Low  
**Condition:** Excellent Good Adequate X Poor  
**Performance:** Excellent Good X Adequate Poor
A Tool to Evaluate Your Assets & CIP Needs

![Asset Evaluation Diagram]

**Condition**
- **Very Good**
- **Good**
- **Fair**
- **Poor**
- **Very Poor**

**Criticality**
- **Low Impact**
  - Raw Water PS No. 1
  - WRF PS
  - HSPS 1-1 S. Garland and Allen
  - Casa View PS/GSTs, Hailey PS/GSTs, Plant No. 2, Clearwell No. 3
  - Wallace Street Booster PS, Rockwall No. 1, GST/PS, Forney PS/GSTs, Rockwall PS/Clearwell

- **Medium Impact**
  - Plant No. 1
  - Clearwell No. 1, Plant No. 3, Clearwell No. 1
  - Murphy Booster PS, HSPS 1-1 Plano
  - Shiloh PS No. 1, McKinney No. 1 PS/GSTs, Plant No. 1 Clearwell No. 2

- **High Impact**
  - HSPS 3-1
  - HSPS 2-2
  - Shiloh PS No. 2, Plant No. 2 Clearwell No. 1
  - Raw Water PS No. 2, Apollo PS/GST, Plant No. 2 Clearwell No. 2

- **Very High Impact**
  - Raw Water PS No. 3, HSPS 2-1, Plant No. 3 Clearwell No. 2
  - HSPS 2-3

**SHORT TERM CRITICAL NEEDS**
Current State of Colorado River Water Supply

• Lake Mead has been at historically low levels

• Some recovery but Lake has been within 6 feet of a level that would impact Arizona CAP water deliveries

• Current level is about 54% of capacity
Meeting the Challenges Will Require Harnessing the Best Practices and Ideas from Both the Public and Private Sectors

A Strong and Effective Partnership
THREE KEY PRINCIPLES OF PARTNERSHIP

PURE ALIGNMENT
- Connect with clients on a foundation of clarity, trust and mutual understanding.
- We make their goals, our goals.
- Tailor the right mix of skills and resources to every project.

PURE ACCESSIBILITY
- Open and transparent with our clients and each other.
- Make information and insights easy to see, understand and share.
- We’re always available and open to share our skills, ideas and thinking.

PURE ACCOUNTABILITY
- Hold ourselves accountable to our clients and ourselves.
- Continuous improvement through rigorous compliance.
- Ongoing safety, training and professional development.
Thank You

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