Memorandum

Date
January 8, 2009

To
Council Transportation and Environment Committee:
Linda Koop, Chair; Sheffie Kadane, Vice Chair;
Jerry R. Allen, Carolyn R. Davis, Voncéil Jones Hill,
Angela Hunt, Pauline Medrano, Ron Natinsky

Subject
Water Utilities Department
Advanced Leak Detection

Attached is the material for the briefing that will be presented on Monday, January 12, 2009
regarding leak detection program within Water Utilities Department.

Please contact me if you require additional information.

Ramón F. Miguez, P. E.
Assistant City Manager

Attachment

C: The Honorable Mayor and Members of the City Council
   Mary K. Suhm, City Manager
   Thomas P. Perkins, Jr., City Attorney
   Deborah Watkins, City Secretary
   Craig Kinton, City Auditor
   Judge C. Victor Lander, Administrative Judge
   Ryan S. Evans, First Assistant City Manager
   Jill A. Jordan, P. E., Assistant City Manager
   A.C. Gonzalez, Assistant City Manager
   Forest Turner, Interim Assistant City Manager
   David Cook, Chief Financial Officer
   Jeanne Chipperfield, Director, Office of Financial Services
   Edward Scott, Director, Controller, Office of Financial Services
   Helena Stevens-Thompson, Assistant to the City Manager
   Jody Puckett, P. E., Director, Water Utilities Department
City of Dallas – Water Utilities Department
Advanced Leak Detection

Presented to Transportation and Environment Committee
January 12, 2009
History of Program

- Dallas Water Utilities implemented Leak Detection Program in FY04-05
  - 4 staff members and equipment
  - Program had expectations to survey system every 10 years

- City Council approved $50K enhancements within FY06-07 budget
  - Adding new equipment to program
  - Expanding survey coverage

- City Council approved $652K enhancements within FY08-09 budget
  - Adding 6 staff members and equipment to program, which will increase staff to 14
  - Reducing frequency of pipeline survey from 5 to 2.5 years
Program Focus

Though we can’t predict pipeline failures, today’s technology helps water purveyor’s to better identify and locate known and unknown leaks within water system.

- **Reduced Water loss** – conserves water and lessens impact to environment
- **Financial Improvement** – reduces chemical and electricity costs associated with treatment and delivery
- **Safeguarding public health and property** – reduces likelihood of property damage
- **Improved public relations** – provides visual assurance that system is being maintained
- **Reduced disruption to customers** – enables repairs to occur on a planned basis rather than developing into complete failure, reducing unexpected traffic and service interruptions
Annual Achievements

FY 04-05
479 Miles

FY 05-06
511 Miles

FY 06–07
1001 Miles

FY 07–08
1217 Miles

FY 08–09
Oct - Dec
277 Miles
Leak Detection Program Focus

- **4100 Miles of Small diameter pipelines**
  - Comprises 85% of potable water system
  - 2”-12’ diameter

- **700 Miles of Large diameter pipeline**
  - Comprises 15% of potable water system
  - Pipelines greater than 12”
Small Diameter Pipelines

- Noise Survey
- Acoustic Leak Detection
Methodology

**Noise Survey**
- Field survey utilizing high frequency contact microphone on water services and fire hydrants aboveground.

**Acoustic Correlation**
- Permalog MK3 Leak Noise Loggers are attached to pipes and fittings by field survey teams
- AccuCorr 3000 Correlators used to pinpoint the leak by correlation teams
Acoustic Correlation

Loggers captures leak as it radiates through pipeline
Correlator pinpoints the leak
Small Diameter Results

- Since inception of program, DWU has:
  - Surveyed 3,485 miles of pipeline
  - Identified 791 unknown leaks
  - Average of 0.23 leaks per mile
  - Correlated and marked an additional 800 known leaks for repair, effectively eliminating return trips and time spent on location.
Large Diameter Program

- Although correlators have proven to be effective in detecting leaks on majority of pipe types and sizes, they have limitations. The leak signal dissipates more rapidly within larger diameter pipelines.

- In 2004, with the approval of City Council, Dallas Water Utilities established a price agreement with Pressure Pipe Inspection Company for surveys of pipelines >12” diameter using Sahara technology.

- Sahara is a patented acoustic system that has been widely used throughout the world. Sahara was invented by Water Resource Center (WRC) within the UK.
Sahara®: System

Leak Location

Real Time Data Processing

Frequency

Energy/Amplitude of Sound

Tracking tool

Sensor Head attached to cable within a live pipeline
Sahara: Tethered, In-line Operation

- Flow Direction
- Umbilical Cable
- Sensor Head
- Drogue
Synopsis of Large Diameter Program

- **CBD and Fair Park**
  - 24 different areas

- **Customer Cities Supply Pipelines**
  - 12 different areas

- **Raw Water Transmission Pipelines**
  - 3 different areas

- **Trinity River Floodway and West Dallas**
  - 13 different areas

- **East Dallas**
  - 21 different areas

- **North Dallas**
  - 8 different areas

- **South Dallas**
  - 18 different areas
Large Diameter Results

- Surveyed 40.68 miles of large diameter transmission mains (12” – 84”) with SAHARA
- Identified 60 leaks
- Average of 1.5 leaks per mile
Total Achievements

* Studies have shown (American Waterworks Association) that water leaks may exist for up to two years prior to complete failure.

Monthly Average Water Savings

FY08-09 is YTD
* Leak detection program has effectively prevented 18% or 1651 pipelines from reaching total failure.
Questions?