

Comprehensive Leak Detection Study Delivers Savings of almost \$1 Million Dollars over a Three-Year Phased Program Decatur, Illinois

Leak Detection Program Returns 5:1 on Investment

The City of Decatur, located 180 miles southwest of Chicago, has a 528 mile water distribution system that serves both Decatur and the neighboring Village of Mount Zion with a combined population of 79,000. It also serves a large industrial base with about 75% of its water going to industrial and commercial customers including large grain processors and heavy manufacturers. Like most utilities, they were anxious to provide a robust infrastructure to their customers while still keeping the cost as low as possible. A few years ago, their 17% apparent water loss inspired them to conduct a system-wide leak detection survey. They issued a request for proposals and after face-to-face interviews selected ADS Environmental Services to conduct the study.

It was decided by ADS and the City of Decatur that the study would be a three-year program and the network would be divided into three separate studies of 176 miles each. The total cost of the three-year leak detection survey was \$80,322. This included listening on all hydrants and strategic main line valves and selected B-Box service valves using sensitive sound intensifying instruments.

"We're always looking at our water accountability. You're always upgrading your meters to make sure they're accurate. This was just one piece of the puzzle: Let's find some leaks that we can't see."

**Randy Miller, Water Services Manager
City of Decatur, IL**

"We had about a 17% apparent water loss between what we pump out of our water treatment plant and what we bill to our customers. We thought one of the most important ways to start toward lowering that percentage was to do a systemwide leak detection survey."

"Certainly we had the majority of our water loss through our water mains. But the amount that we were losing from hydrant leaks and water service leaks surprised me. I didn't expect those numbers to be as high as they were. Those are easy fixes that we were able to do right away."

**Keith Alexander, Director of Water Management
City of Decatur, IL**



Excavation of a leak found that did not come to surface. The erosion of the ground under the asphalt could have caused a failure of the road surface at any time.

The Return on Investment for the City of Decatur

An investment of \$80,322 in a leak detection program by the City of Decatur, IL identified \$944,219 in the production cost of water being lost through leakage. Rehabilitation and repair expenses totalled \$70,309. This resulted in a return of \$5.30 per dollar spent on leak detection and elimination, or a return on investment of 5 to 1.

A proactive, and properly designed, leak detection study can help reduce losses at a time when most government departments are focused on reducing operating expenses to meet lower usage and revenue. Reducing water loss saves on the costs of water production and improves the quality of services to customers.

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The first phase began in early 2008 and the three-year program concluded in July of 2010. Each year of the study included a four to six week leak detection process of the identified 176 mile section. The first year included previously identified sites where leaks were suspected and portions of the system with the oldest water mains. City officials were impressed with the accuracy of the leak detection process. This is

"Then there were leaks that had a little bit more volume. We had one that was more than 600,000 gallons per day."

"It kind of gave us a real good snapshot of our system. It just makes you feel better that you don't have any great big leaks out there."

**Randy Miller, Water Services Manager
City of Decatur, IL**

"I would strongly encourage any water utility that has not done a leak detection survey in recent memory to seriously consider doing so."

**Keith Alexander, Director of Water Management
City of Decatur, IL**

a critical component of the services that ADS offers. Before ADS tells the city to bring a backhoe out and begin digging, they are committed to the highest possible degree of accuracy in pinpointing the leaks.

One of the strategies behind the three-phased program was to ensure that the City's water distribution maintenance team could manage the repair work generated by the leak detection while still addressing the water main breaks that occurred and other traditional maintenance.

Ideally, the City would like to see a reduction in water loss from the 17% in 2008 to 10%, but they recognize this will take several years. More immediate returns on the project have come on two levels, cost savings and increased knowledge of their distribution system. The peace of mind that there are no large leaks lurking and threatening to create dangerous situations for their community is one area of knowledge improvement. The City also learned a good bit about improved maintenance techniques for hydrants which were responsible for a portion of the water loss.

ADS recommended that the City of Decatur continue their leak detection program on a regular basis in order to keep underground leakage to a minimum. They recommended a rotating system of leak detection. This system would re-investigate the area completed in the first year of the survey since it has been two years since the last survey was completed. New leaks will inevitably occur and smaller, undetected leaks will become larger.



Excavation conducted to expose the leak for repair while leaking water was being pumped out.

Comprehensive leak detection can reduce water loss, eliminate unnecessary water production costs, and expand the useful life of infrastructure.

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