

# Leak Survey

## Town of Weston Massachusetts

December 2017



*Prowler Water Conservation Systems, llc*

Supplying Leak Detection Solutions for Water & Sewer

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### LEAK SURVEY REPORT- Weston water system – December 2017

Date of Survey started November 9 ended December 15

#### Scope of Survey

100 miles of the Weston distribution system were covered in this survey. All water mains on provided system maps were surveyed. Every hydrant and each valve box, where visible, in the system was contacted by our personnel. In addition any service boxes that were visible near the street were also contacted. Water mains into private sections that did not have master meters were also inspected.

Cross country transmission lines that passed through wooded areas and under rivers were also surveyed by our crew as well as heavily traveled areas, these include:

Norumbega from Loring to Gatehouse Lane

Riverside to Tandem Parking Lot at Rte 30

Warren St to Boston Post Rd.

Spruce Hill to North Ave.

Brenton Rd. to Oakdale

River Edge to Cutters Bluff

River Rd to Norumbega

High Meadow Rd to Wellesley St.

All of Wellesley St.

All of Glen Rd.

Warren Ave thru wetlands to Route 20

Juniper Rd to Harrington Lane

All Mains on Rte 30, Rte 20 and the Bypass

End of Juniper to Campion Center

Main from Park Rd to Glen Feld East Rd. (thru Mass Pike Interchange)

#### Employees involved in this survey:

Alan Banks - 42 years water system leak experience

Jesse Riedle-9 years water system leak experience

Matt Grouf - 6 years water system leak experience

James Reidy –23 years water system leak experience

James Riopel- Apprentice

Ed McGuinn- 2 years water system leak experience

Personnel and dates in the Weston system		
11-9	11-11 Crew of 2	11-13
11-14	11-16	11-17
11-21	11-22 crew of 2	11-25 crew of 2
11-27 crew of 2	11-28	11-29
12-4 crew of 2	12-5 crew of 2	12-7 crew of 3
12-8 crew of 2	12-9 crew of 2	

## PRELIMINARY FINDINGS:

The Water office was notified of potential leaks as the survey progressed. Normally, meetings are set up to qualify or eliminate these areas with the water crew. Pipe material and soil conditions that are documented where noise is discovered are discussed at these meetings because that information can effect further investigation. Noises caused by Pumps or sewer manholes that can't be seen are typically found at these meetings. Other Utilities, such as Sewer, Highway and Gas are typically contacted for these meetings if the presence of their lines could alter or effect any sounds that are discovered in the area of focus. Water leaks can be located electronically by correlators but no leaks are pursued and reported unless they are physically heard with acoustic equipment. There were nine (5) field meetings with the water personnel in the course of this survey to do close inspections on potential leaks.

## DESCRIPTION OF EQUIPMENT USED:

The leak locators we use are sophisticated electronic instruments manufactured by SEBA Kmt of Baunach German.. These devices are digital, state of the art, self-contained instruments equipped with headphones, sensitivity and gain controls and a transducer ground pick-up. These devices are very sensitive to sound and are capable of detecting water leakage of approximately 1/2 gallon per minute. Water escaping from the orifice of a pipe has its own distinctive sound and can be heard by our instrument over other surrounding disturbances such as wind, automobiles and aircraft, and other underground utilities such as sewer flows, drainage flows, etc. The difference between this detector and others on the market is that it will respond to leak sounds beyond human hearing and give you a visible read out on the screen when this occurs. Our company has used this particular leak detector in all our previous leakage surveys and considers this device to be excellent in this field.

**Instrumentation Used in this survey:**  
**Subsurface LD-18 Digital Leak Detector**  
**Primayer Hykron 2 Leak survey tools**  
**SEBA Kmt Model HL6000x Digital Computerized Leak Correlators**  
**ZCorr Digital Correlating Loggers**

SEBA Leak Correlators, are highly sophisticated leak finders that will pinpoint leaks that are difficult to locate above ground with our acoustic leak detection equipment. The equipment consists of a central unit, or processor, in which important data is entered, such as the type of pipe material, size of pipe, etc. A second link, or transmitter, is also used in the process of locating the leak. Both units have very highly sensitive sensors which are placed directly on the pipe on easily accessible spots, such as valves, hydrants or house connections. A water leak creates a noise which transmits on the pipes to both sides of the leak. The central unit compares the leak noises picked up by both sensors, and measures the time delay of the leak noise reaching both sensors. The computer processors measure the time lag between the sound coordinates and based on pipe size and diameter they will display the footage from each sensor to the location of the leak. The Correlator is not affected by external noises such as passing traffic. Real time Correlators have a built in field calibration test that is used to verify that the instruments are in working order and are ready to process the sound that is heard between the placed microphones. This test typically gives a result of either "leak present" or "leak presence doubtful".

## CONCLUSION

Leak detection surveys, and the subsequent repairs that are the result of such surveys, serve as the most cost effective means of conserving water and at the same time increasing revenue while saving rate payers valuable financial resources. Leak detection programs lead to increased knowledge of the distribution system, more efficient use of existing supplies, safeguarding public health and property, improved public relations, reduced legal liability due to property damage and reduced disruptions of water service to the departments customer base. Leak detection is an integral part of a complete water conservation program and, coupled with public education in water conservation, consumers are more likely to repair and report leaks as soon as possible.

### FINAL LEAK SURVEY REPORT – **Weston water system**

#### Full SURVEY STARTED December 2017

(An average GPM - gallons per minute - was conservatively estimated for each category of the leaks located throughout the system.)

Total gallons per minute for each category -

Main / Service leaks = 3 Total - 74 GPM

4 Hydrant leaks found - GPM estimated --Total 19 GPM

Total GPM for all categories of leaks detected - 93 GPM

Total estimated *daily water leakage* from leak detection - Approx. 133,920 gal.

Total water leakage per month from leak survey -Approx. 4.02 Million Gals

#### REVENUE SAVED FROM UNACCOUNTED FOR WATER LEAKAGE=

As of June 2015 the A.W.W.A. quotes the national average cost for pumping 1,000,000 gallons of water per year is \$2,155.00. This cost is based on electricity, chemical treatment, maintenance, manpower, etc.

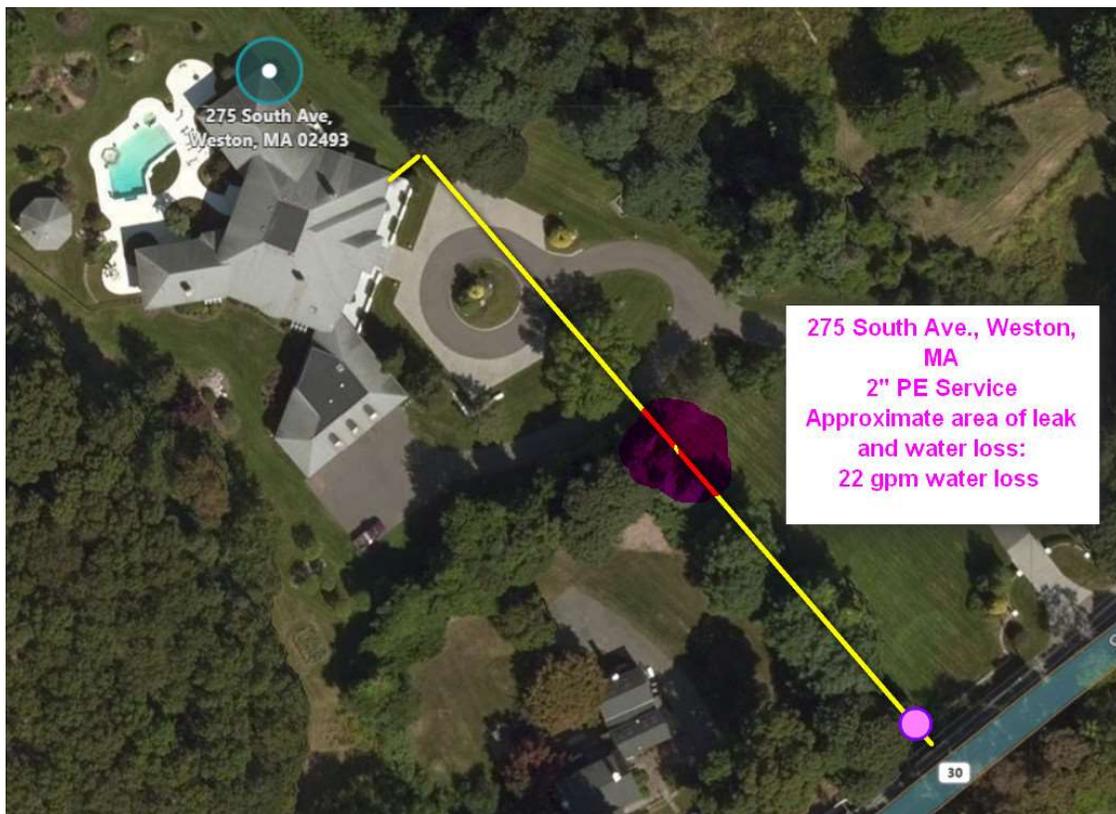
Revenue saved from unaccounted for water leakage:

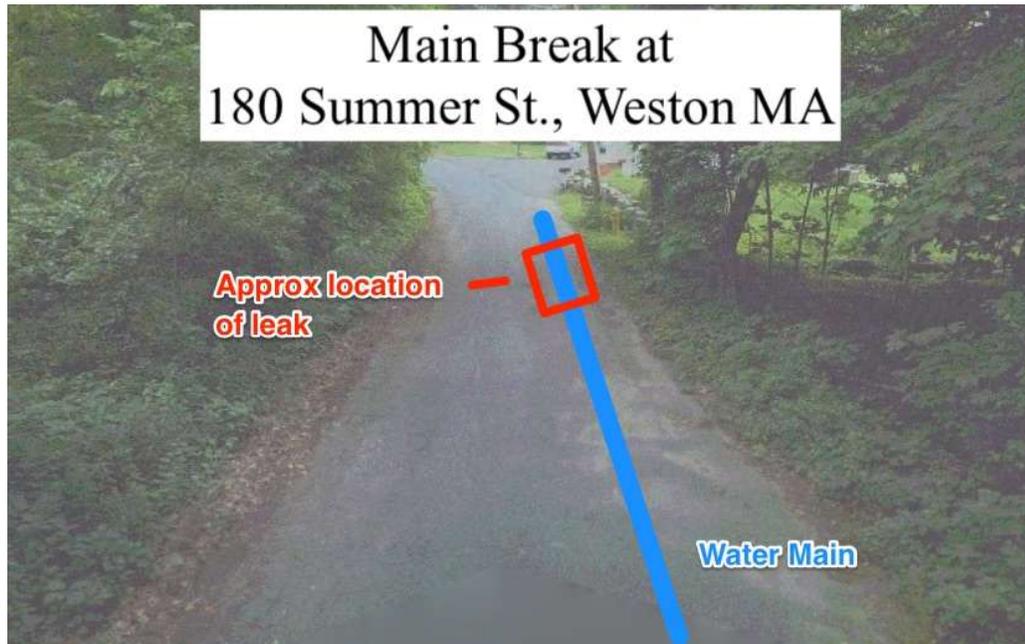
Total annual leakage detected in Weston system– 48.2 Million Gallons Year

Total annual potential revenue value saved from these repairs -\$ 103,871.00 /year

The survey discovered the following leaks:

Item	Place	Approx Loss GPM	Tech
Hyd	111 Bradford Rd.	4	JRip
Hyd	168 Summer St.	5	JRip
Hyd	30 Kingsbury Lane	3	JRip
Hyd	64 Arrowhead Rd.	7	EM
Service	275 South Ave.	23	MG
Main	180 Summer St.	35	MG
Service	73 Concord Rd.	16	MG
<b>Hydrants Approx Loss Total in GPM</b>		<b>19</b>	
<b>Services or Mains Total in GPM</b>		<b>74</b>	
<b>GRAND TOTAL APPROX GPM</b>		<b>93</b>	





## COMMENTS

The small number of hydrants that were found leaking for a system that flushes every year is commendable and speaks well of the distribution personnel who are obviously well trained and diligent about proper hydrant shut downs. We wish to thank David Fava for his pro-active attention to the leaks that were reported. Mr. Fava responded quickly when contacted about potential leaks in the system and a crew was dispatched immediately to help us in further focusing on potential leak areas.

Gallons per minute totals are approximated by sound only and based on system pressures recorded.

Prepared by Alan Banks, President & GM 12-29-17