

Town of North Reading Massachusetts  
Department of Public Works  
Water Department

Water System Leak Detection Survey Report  
2014

Prepared By

Arthur Pyburn & Sons Inc.

Technical Services

1065 Summer Street ♦ Lynnfield, MA 01940

617-529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)

# Arthur Pyburn & Sons Inc.

## Technical Services

1065 Summer Street ♦ Lynnfield, MA 01940

617-529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)

November 17, 2014

Town of North Reading  
Department of Public Works  
Water Department  
235 North Street  
North Reading, MA 01864

The following is a summary of leak detection performed on 80 miles of the North Reading Water Department's distribution system.

The pages that follow are the individual reports for each leak.

During the course of this survey leaks were found at the following locations.

Services found to be leaking:

- 72 Elm Street, 3 to 5 GPM
- An abandoned service on Haverhill Street by the Ipswich River across from pole 153, service leaking, 1 to 2 GPM
- 189 Haverhill Street, 2 to 4 GPM
- 185 Chestnut Street, 1 to 3 GPM
- 51 Niblick Way, 1 to 3 GPM
- 12 Macintyre Drive, 1 to 3 GPM
- 14 Fox Run Lane, 2 to 4 GPM
- 6 Pickard Lane, 1 to 3 GPM
- 12 Turner Drive, 1 to 3 GPM
- 9 Heritage Way, 1 to 3 GPM
- 28 Crestwood Drive, 2 to 4 GPM
- 6 Crestwood Drive, 2 to 4 GPM
- 4 Rust Lane, 2 to 4 GPM
- 7 Stonecleve Road, 1 to 3 GPM
- 8 School Hill Lane, 2 to 4 GPM

- 14 Pine Glen Road, 2 to 4 GPM
- 9 Olde Farm Lane, 2 to 4 GPM
- 1 Liberty Lane, Need to expose curbstop
- Kitty's Restaurant, 2 to 4 GPM
- 126 Chestnut Street, 2 to 4 GPM
- 8 Green Meadow Drive, 1 to 3 GPM
- 7 Hayward Farms Lane, 2 to 4 GPM
- 47 Chestnut Street, 2 to 4 GPM
- 10 Woodland Drive, 1 to 3 GPM
- 23 Flint Street, 1 to 3 GPM

Hydrants found to be leaking:

- Hydrant at intersection of Riverside Drive and East Street, leaking ½ to 1 GPM
- Hydrant across from 7 East Street, leaking 1 to 2 GPM
- Hydrant by Marblehead and Ten Rod Road across from 96 Marblehead, leaking ½ to 1 GPM
- Hydrant by 22 Wright Street, leaking ½ to 1 GPM
- Hydrant at the end of Smythe Circle, leaking 1 to 2 GPM
- Hydrant leaking by 73 Concord Street, leaking ½ to 1 GPM
- Hydrant by 9 Laurel Road, leaking ½ to 1 GPM
- Hydrant by 19 Shady Hill Drive, leaking ½ to 1 GPM
- Hydrant by 6 Pomeroy Road, leaking 1 to 2 GPM
- Hydrant by 27 Southwick Road, , leaking ½ to 1 GPM
- Hydrant on Little Meadow Way on the right side of the fork coming into the development, leaking ½ to 1 GPM

The total leakage due to service and Hydrant leaks is estimated to be between 44 and 98 gallons per/min.

Main Line leaks:

- Service or main leak by 24 Haverhill Street, leaking 4 to 8 GPM
- Believed to be a mechanical joint on valve for Lisamary Drive, leaking 1 to 2 GPM

The leakage due to main leaks is estimated to be between 5 and 10 gallons per/min.

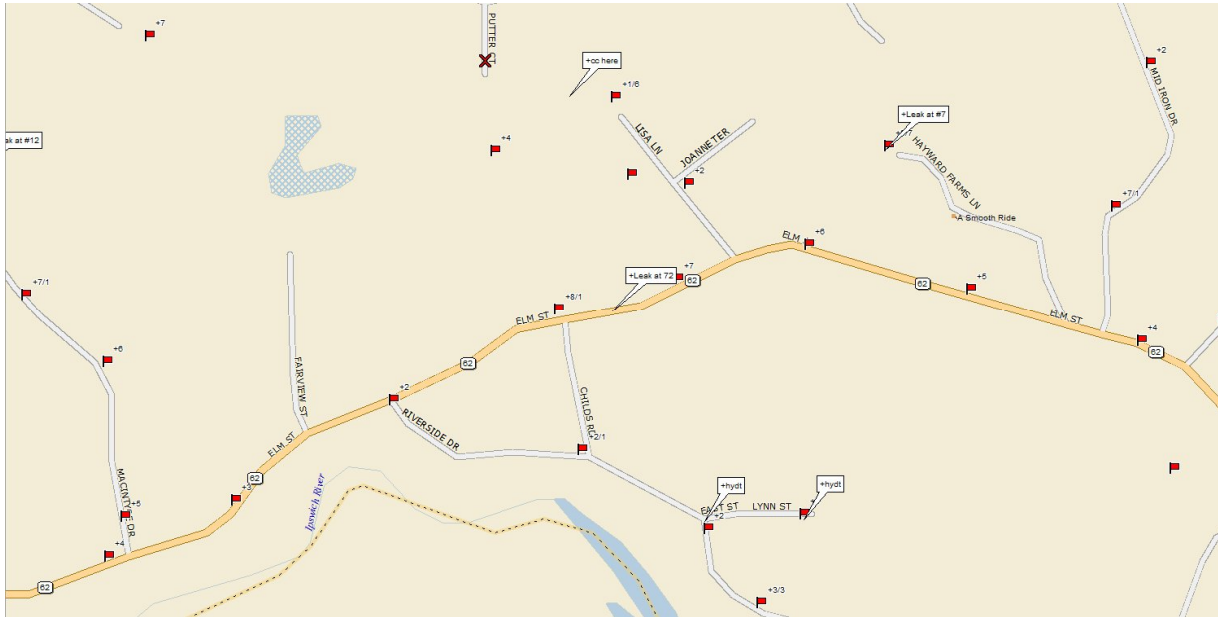
In conclusion, 38 leaks were located during the course of this survey. The total of estimated leakage from the leaks found during this survey is approximately 49 to 108 gallons per/min.

The leakage amounts noted in this report are only estimates and require confirmation during the repair of the leaks.

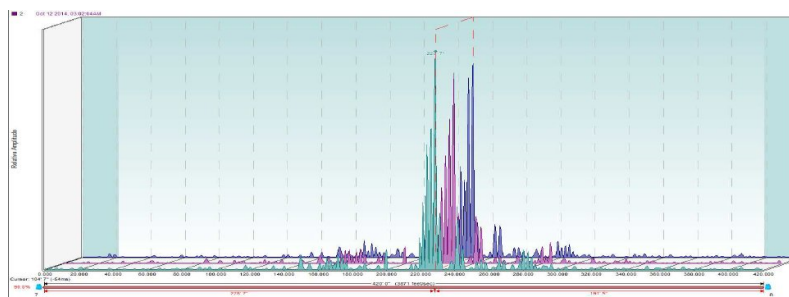
Respectfully Submitted by Gregory Pyburn

# Leak worksheet

**gpyburn@apsitech.com**

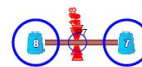


Date and time of detection on correlation: 10/12/2014 3:01 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P7	420' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Peak	Correlation between Concentration and Flow	Recording Time
L28	228° 7' from 7	7-9	90.0%
L29	228° 21' from 7	7-9	89.4%
L30	228° 27' from 7	7-9	89.4%
L31	182° 0' from 8	8-9	71.5%
L32	182° 0' from 8	8-9	71.9%
L33	182° 10' from 8	8-9	74.6%
L43	228° 7' from 7	7-9	90.0%
L44	228° 7' from 7	7-9	89.3%
L45	228° 7' from 7	7-9	89.3%
L46	228° 7' from 7	7-9	89.3%
L47	228° 7' from 7	7-9	89.3%

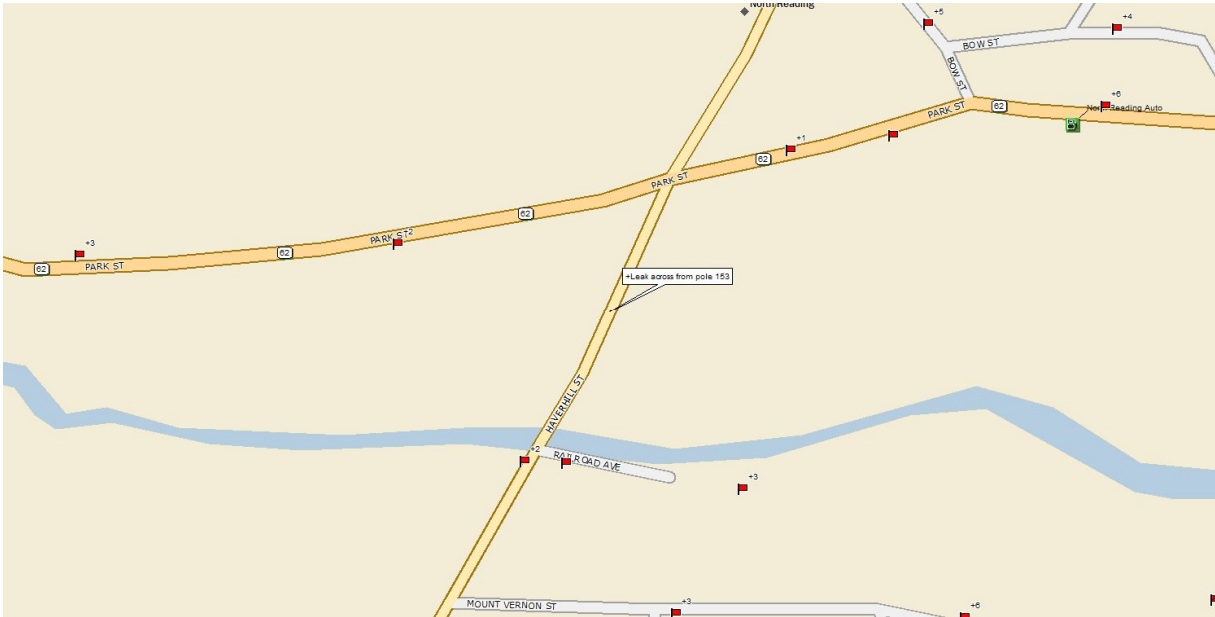


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System Name: Town of North Reading, Massachusetts

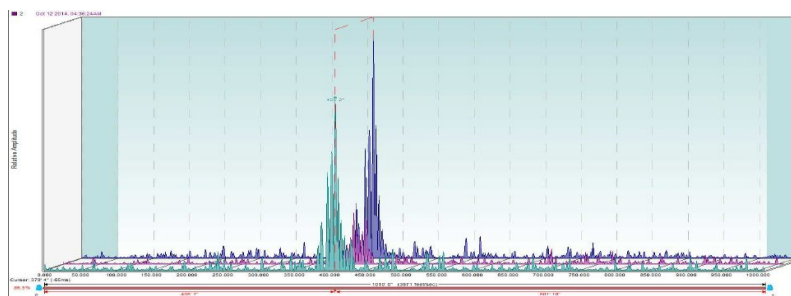
Department of Public Works, Water Department

Location: An abandoned service on Haverhill Street by the Ipswich River across from pole 153

Approx. Size: 1-2 GPM

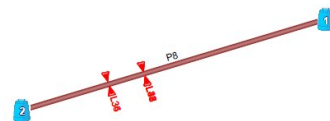
Weather: 38°F Clear, 6MPH Wind

Date and time of detection on correlation: 10/12/2014 4:35 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P8	1010' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L31	408' 2" from 2	2 → 1	88.5%	Oct 12 2014, 04:35:24AM
L32	407' 9" from 2	2 → 1	88.5%	Oct 12 2014, 04:35:24AM
L33	408' 2" from 2	2 → 1	88.2%	Oct 12 2014, 04:37:24AM
L34	722' 9" from 1	1 → 3	88.8%	Oct 12 2014, 04:35:24AM
L35	722' 4" from 1	1 → 3	89.9%	Oct 12 2014, 04:35:24AM
L36	722' 9" from 1	1 → 3	90.4%	Oct 12 2014, 04:37:24AM
L40	408' 2" from 2	2 → 1	88.5%	Oct 12 2014, 04:35:24AM
L47	407' 9" from 2	2 → 1	88.5%	Oct 12 2014, 04:35:24AM
L48	408' 2" from 2	2 → 1	88.2%	Oct 12 2014, 04:37:24AM



Printed Oct 18 2014, 04:51:48PM, Recorded Oct 12 2014, 04:35:24AM

C:\My Documents\SoundSens\North Reading 2014\Haverhill Street by Park Street.snd

38°F Clear, 6MPH Wind

**RADCOM** **SoundSens**  
TECHNOLOGIES LTD Leak Localisation & Correlation

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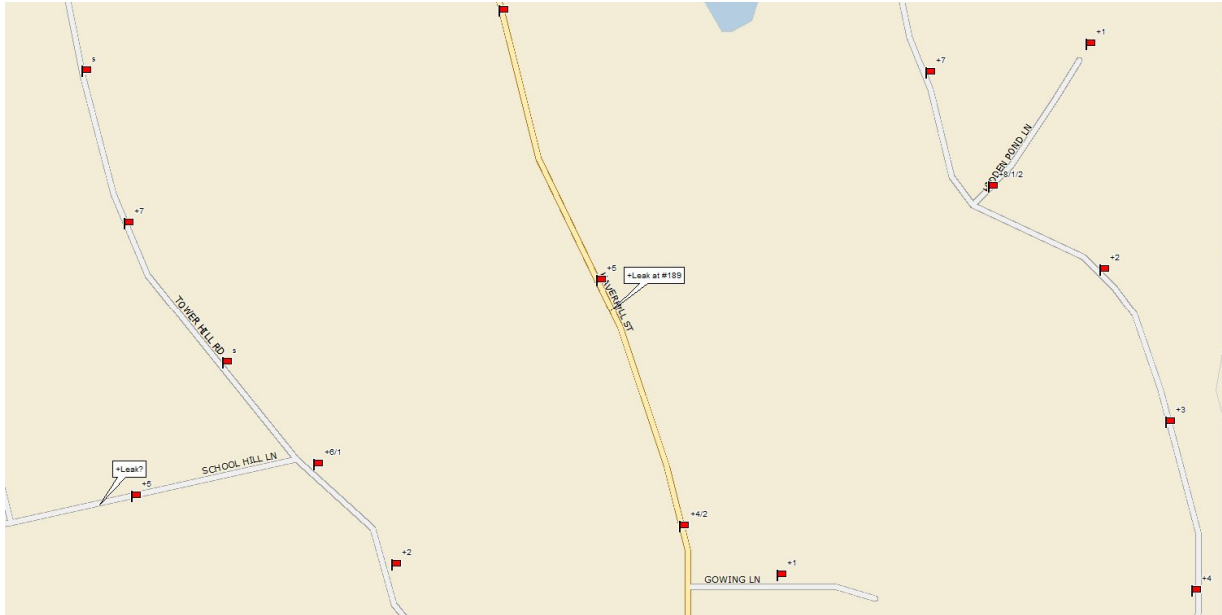
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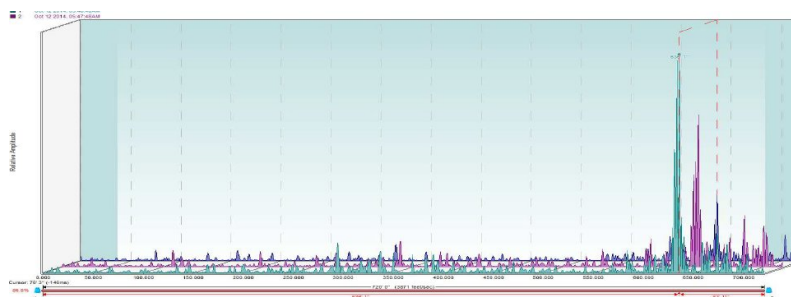
Department of Public Works, Water Department

Location: 189 Haverhill Street, Service Leaking

Approx. Size: 2-4 GPM

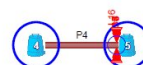
Weather: 37°F Clear, 9MPH Wind

Date and time of detection on correlation: 10/12/2014 5:46 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P4	725' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L16	530' 1" from 4	4 -> 5	86.8%	Oct 12 2014, 05:46:48AM
L17	530' 5" from 4	4 -> 5	86.3%	Oct 12 2014, 05:47:48AM
L18	530' 1" from 4	4 -> 5	81.1%	Oct 12 2014, 05:48:48AM
L34	530' 5" from 4	4 -> 5	84.7%	Oct 12 2014, 05:47:48AM
L35	530' 1" from 4	4 -> 5	81.1%	Oct 12 2014, 05:48:48AM



elm to esienhauer

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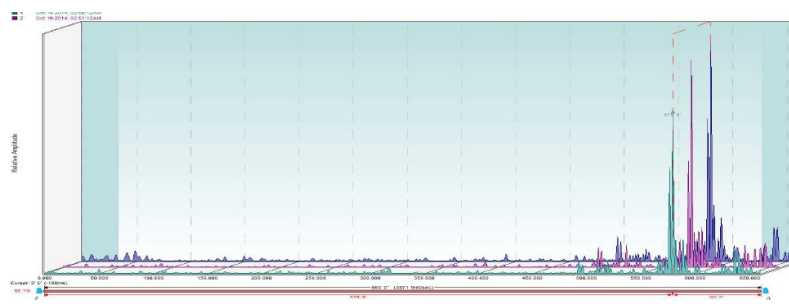
Department of Public Works, Water Department

Location: 185 Chestnut Street, Service Leaking

Approx. Size: 1-3 GPM

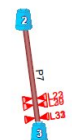
Weather: 54°F Overcast, 8MPH Wind

Date and time of detection on correlation: 10/19/2014 2:50AM



Pipe ID	Length	Diameter	Material	Sound Velocity
PT	880' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L22	1265' 7" from 4	4 -> 3	80.8%	Oct 19 2014, 02:50:12AM
L23	1265' 2" from 4	4 -> 3	79.2%	Oct 19 2014, 02:51:12AM
L29	1405' 11" from 1	1 -> 3	80.6%	Oct 19 2014, 02:51:12AM
L30	1405' 11" from 1	1 -> 3	74.2%	Oct 19 2014, 02:52:12AM
L31	870' 0" from 2	2 -> 3	80.1%	Oct 19 2014, 02:50:12AM
L32	870' 0" from 2	2 -> 3	80.1%	Oct 19 2014, 02:51:12AM
L33	860' 1" from 2	2 -> 3	89.8%	Oct 19 2014, 02:52:12AM





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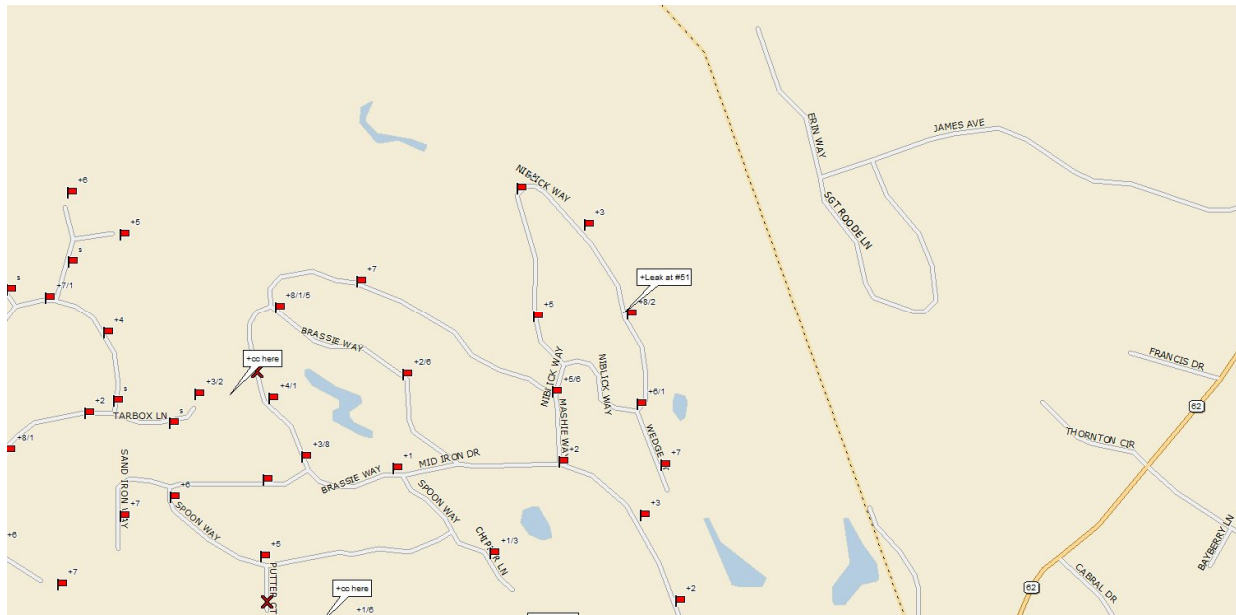
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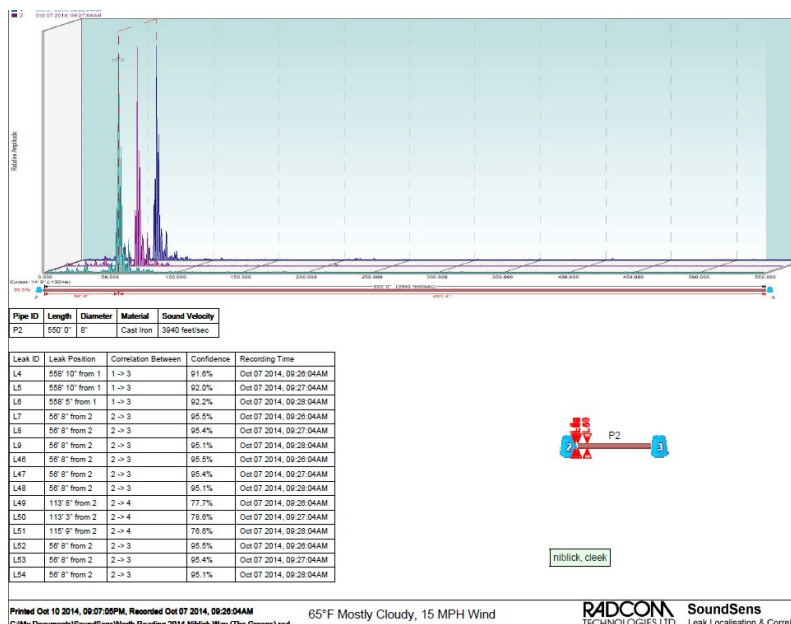
Department of Public Works, Water Department

Location: 51 Niblick Way, Service leaking

Approx. Size: 1-3 GPM

Weather: 56°F Mostly Cloudy 15MPH Wind

Date and time of detection on correlation: 10/7/2014 9:26AM



Printed Oct 10 2014, 09:07:09PM. Recorded Oct 07 2014, 09:26:04AM  
C:\Me Documents\SoundSens\North Reading\2014 Niblick Way (The Green)\out

65°F Mostly Cloudy, 15 MPH Wind

RADCOM TECHNOLOGIES LTD SoundSens Leak Localisation & Correlator

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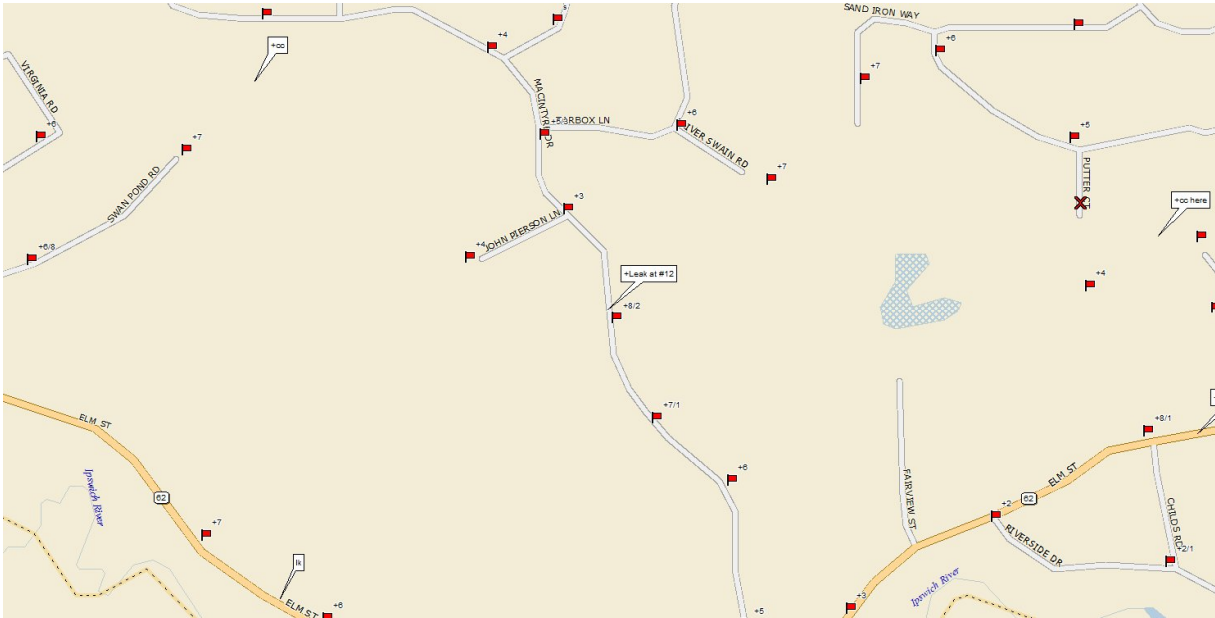
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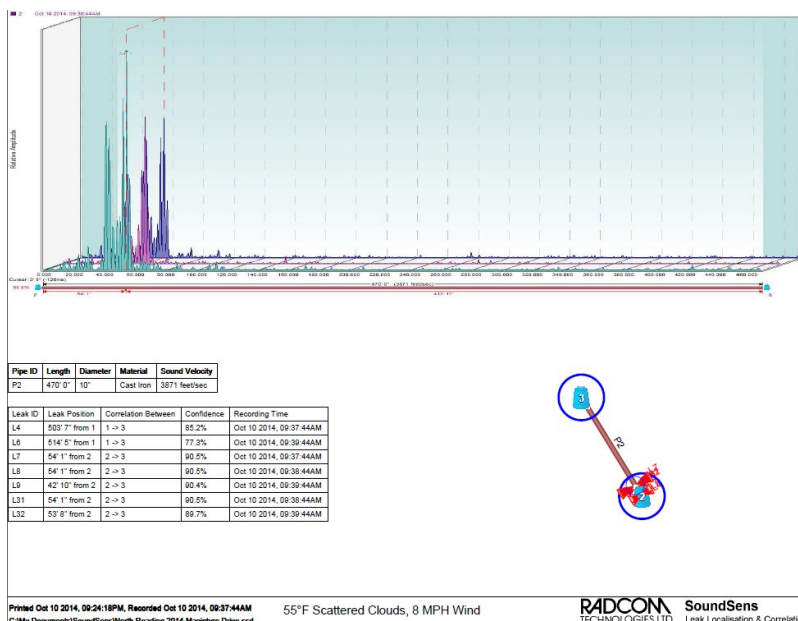
Department of Public Works, Water Department

Location: 12 Macintyre Drive, Service Leaking

Approx. Size: 1-3 GPM

Weather: 55°F Scattered Clouds, 8MPH Wind

Date and time of detection on correlation: 10/10/2014 9:37AM

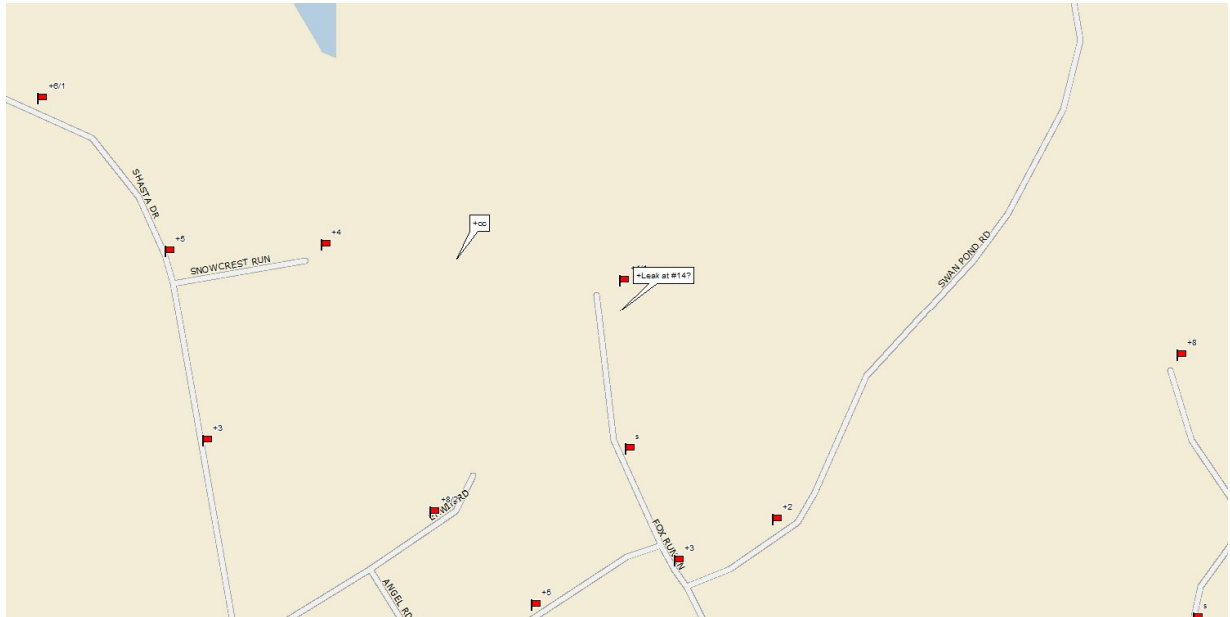


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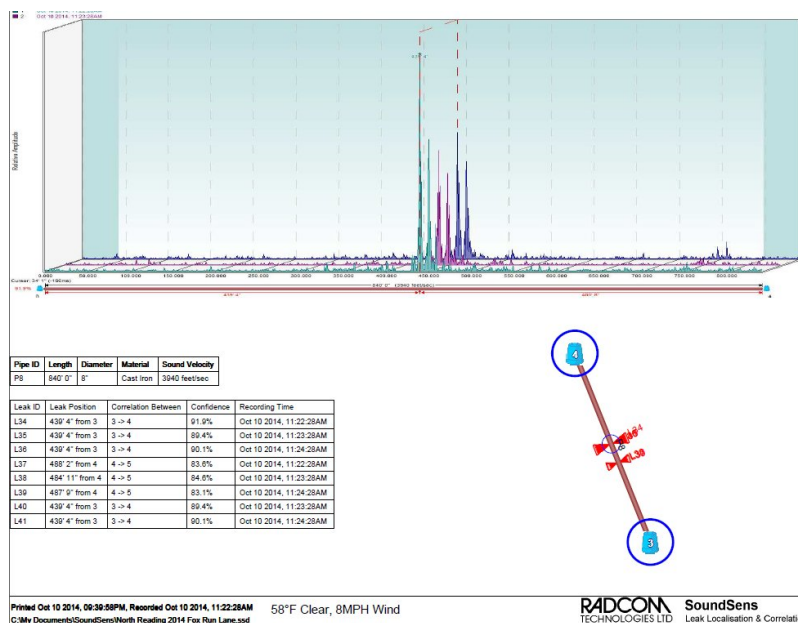
**Department of Public Works, Water Department**

**Location:** 14 Fox Run Lane, Service Leaking

**Approx. Size:** 2-4 GPM

**Weather:** 58°F Clear, 8MPH Wind

**Date and time of detection on correlation:** 10/10/2014 11:22 AM



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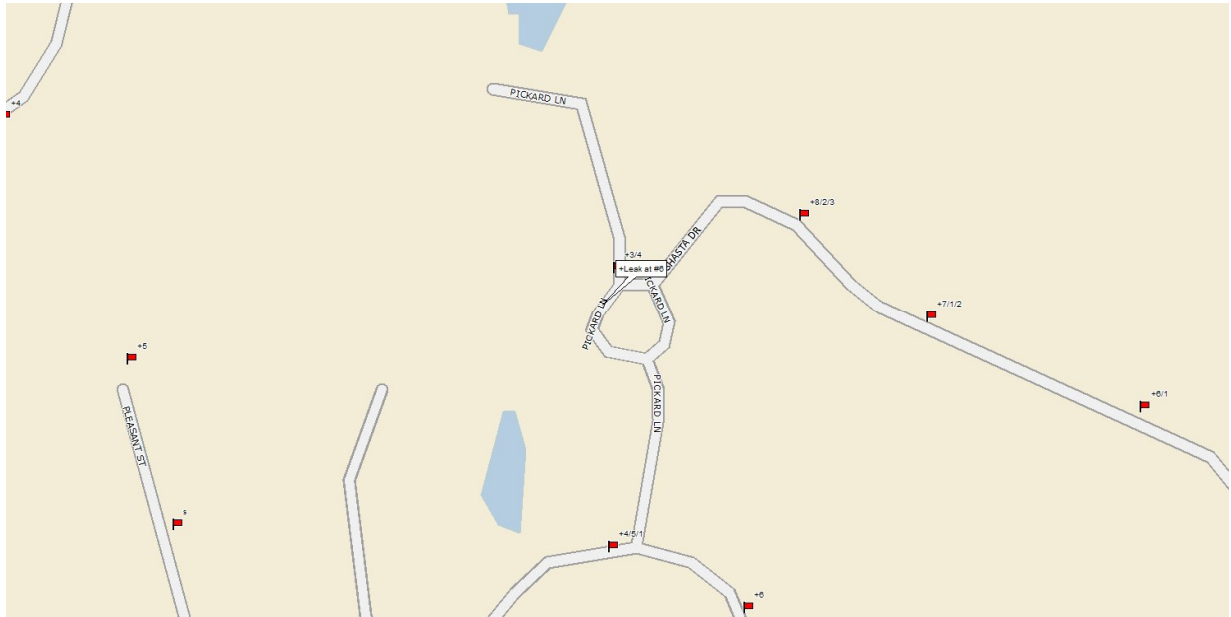
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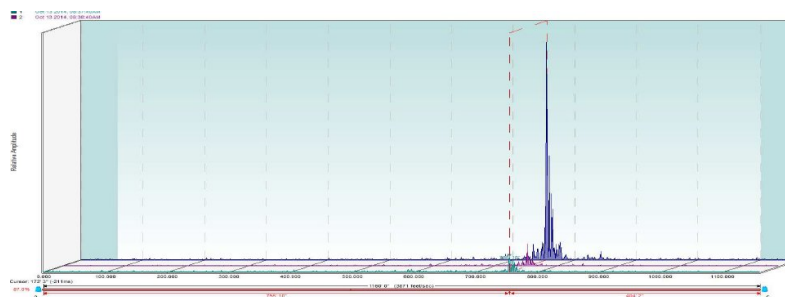
Department of Public Works, Water Department

Location: 6 Pickard Lane, Service Leaking

Approx. Size: 1-3 GPM

Weather: 50°F Clear, 3MPH Wind

Date and time of detection on correlation: 10/13/2014 8:37 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P3	500' 0"	10"	Cast Iron	3871 feet/sec
P4	650' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L10	270' 0" from 3	3 -> 4	70.4%	Oct 13 2014, 08:37:40AM
L11	220' 5" from 3	3 -> 4	82.8%	Oct 13 2014, 08:38:40AM
L12	200' 7" from 3	3 -> 4	72.3%	Oct 13 2014, 08:39:40AM
L13	750' 10" from 3	3 -> 5	87.0%	Oct 13 2014, 08:37:40AM
L14	753' 10" from 3	3 -> 5	89.0%	Oct 13 2014, 08:38:40AM
L15	753' 10" from 3	3 -> 5	85.0%	Oct 13 2014, 08:39:40AM
L16	520' 0" from 4	4 -> 5	87.2%	Oct 13 2014, 08:37:40AM
L17	520' 0" from 4	4 -> 5	75.0%	Oct 13 2014, 08:38:40AM
L18	524' 10" from 4	4 -> 5	77.9%	Oct 13 2014, 08:39:40AM
L34	753' 10" from 3	3 -> 5	89.0%	Oct 13 2014, 08:38:40AM
L35	753' 10" from 3	3 -> 5	95.0%	Oct 13 2014, 08:39:40AM



shastya, turner

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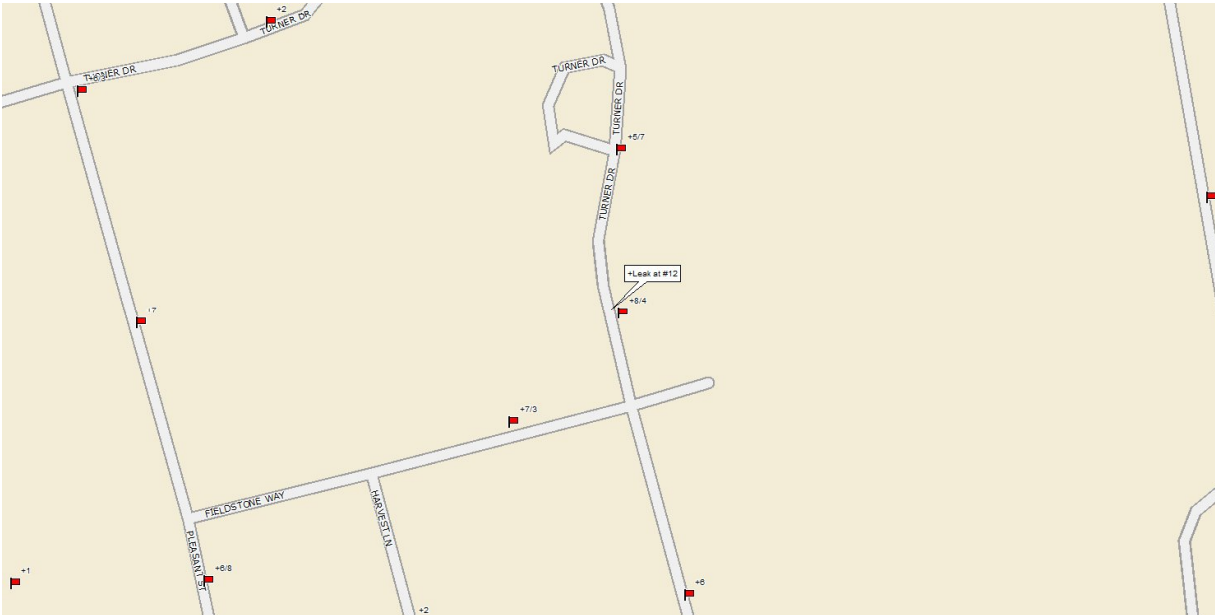
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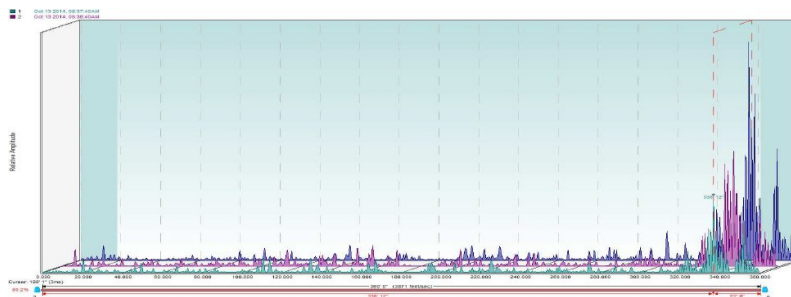
Department of Public Works, Water Department

Location: 12 Turner Drive, Service Leaking

Approx. Size: 1-3 GPM

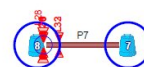
Weather: 50°F Clear, 4MPH Wind

Date and time of detection on correlation: 10/13/2014 8:37 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P7	300' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L28	336' 12" from 7	7 → 8	80.2%	Oct 13 2014, 08:37:40AM
L29	337' 10" from 7	7 → 8	80.1%	Oct 13 2014, 08:38:40AM
L30	336' 5" from 7	7 → 8	85.2%	Oct 13 2014, 08:39:40AM
L32	88' 9" from 8	8 → 6	71.1%	Oct 13 2014, 08:39:40AM
L33	87' 11" from 8	8 → 6	80.4%	Oct 13 2014, 08:39:40AM
L34	337' 10" from 7	7 → 8	80.1%	Oct 13 2014, 08:39:40AM
L35	336' 5" from 7	7 → 8	84.6%	Oct 13 2014, 08:39:40AM



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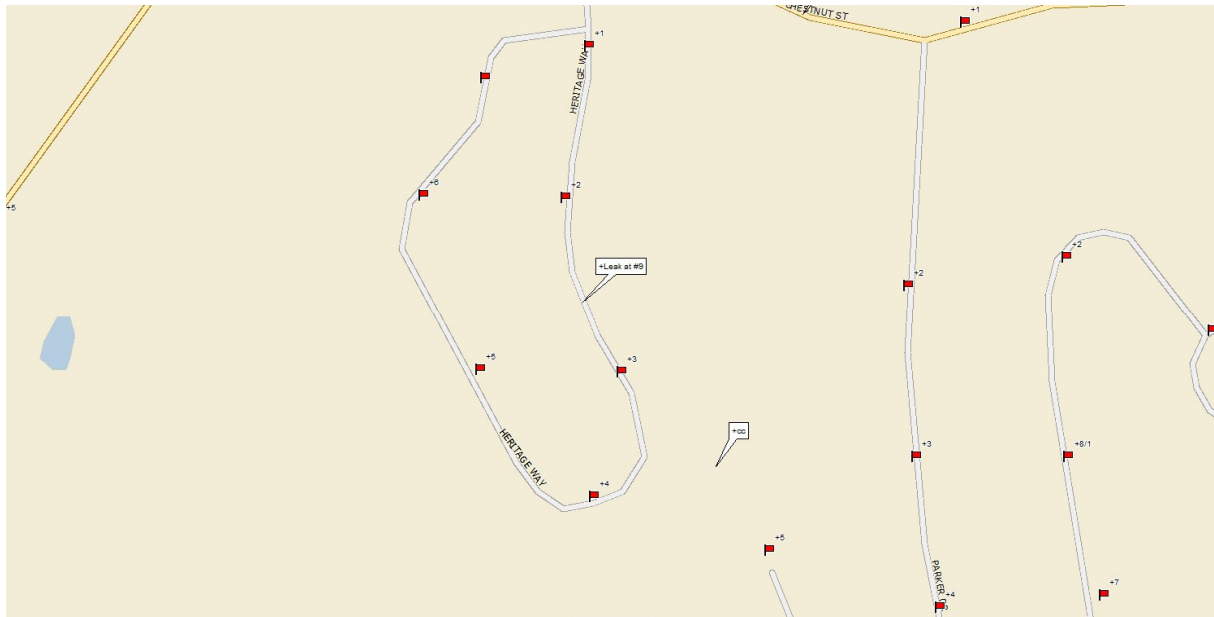
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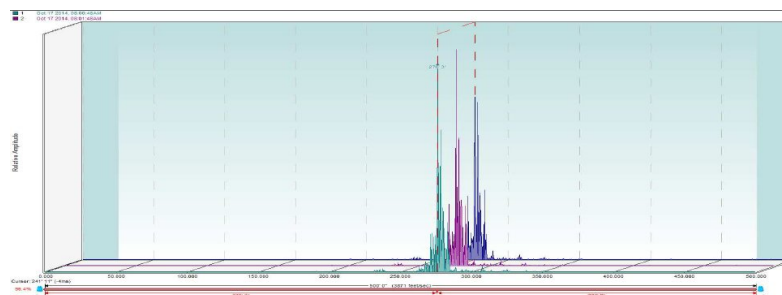
Department of Public Works, Water Department

Location: 9 Heritage Way, Service Leaking

Approx. Size: 1-3 GPM

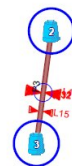
Weather: 60°F Fog, 7MPH Wind

Date and time of detection on correlation: 10/17/2014 8:00 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P3	500' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L10	278' 3" from 2	2 -> 3	99.4%	Oct 17 2014, 08:00:48AM
L11	278' 3" from 2	2 -> 3	99.3%	Oct 17 2014, 08:01:48AM
L12	278' 11" from 2	2 -> 3	99.0%	Oct 17 2014, 08:02:48AM
L15	358' 9" from 2	2 -> 4	94.4%	Oct 17 2014, 08:02:48AM
L31	278' 3" from 2	2 -> 3	99.3%	Oct 17 2014, 08:01:48AM
L32	278' 3" from 2	2 -> 3	99.8%	Oct 17 2014, 08:02:48AM



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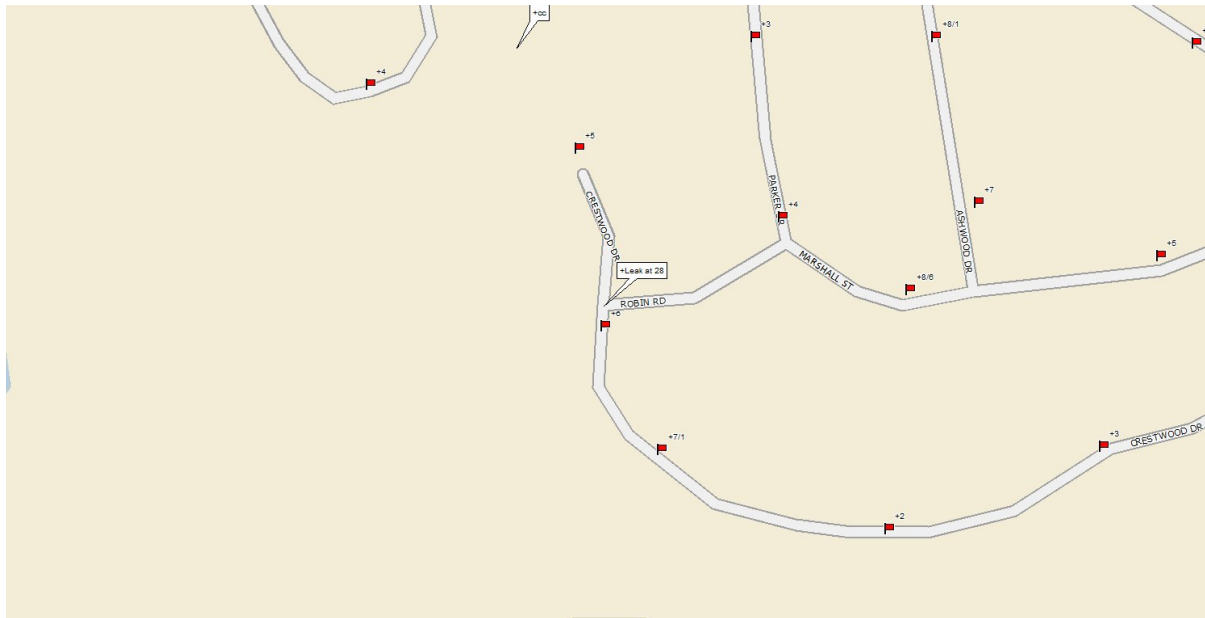
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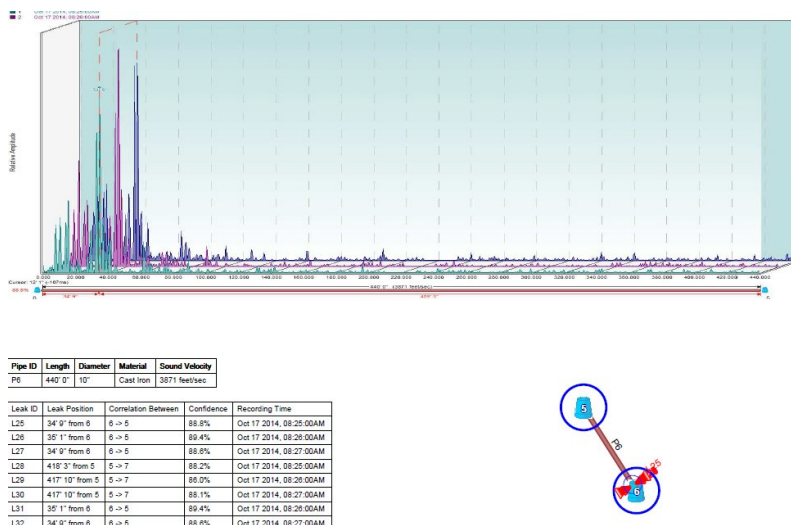
Department of Public Works, Water Department

Location: 28 Crestwood, Service Leaking, Main to Box to Cellar

Approx. Size: 2-4 GPM

Weather: 61°F Fog, 10 MPH Wind

Date and time of detection on correlation: 10/17/2014 8:25 AM





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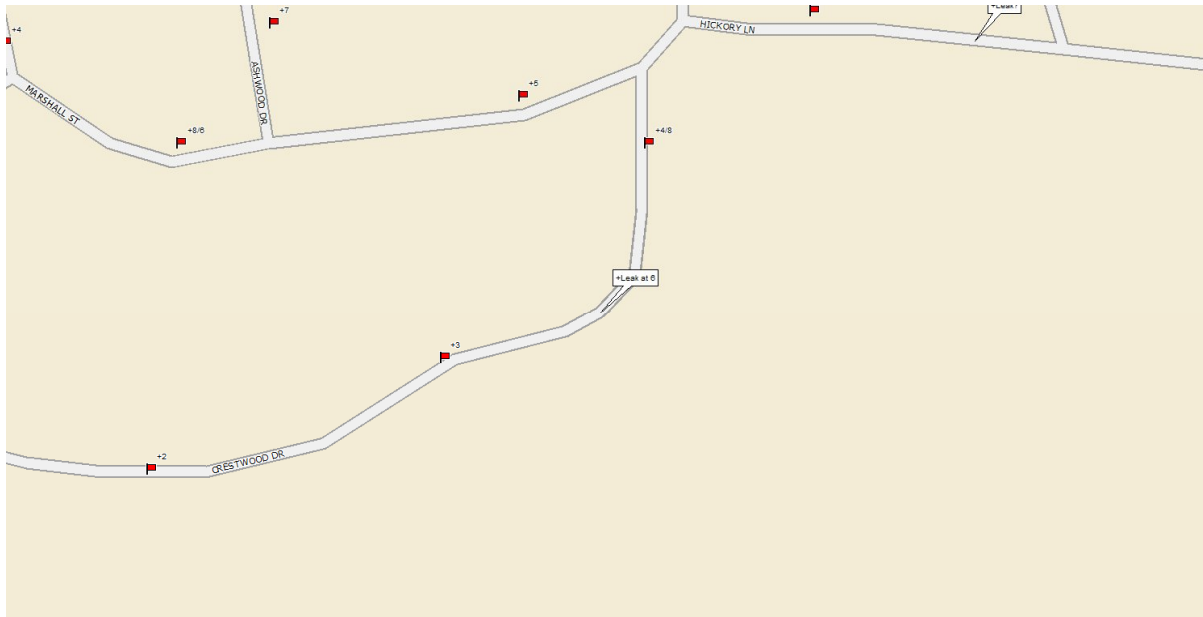
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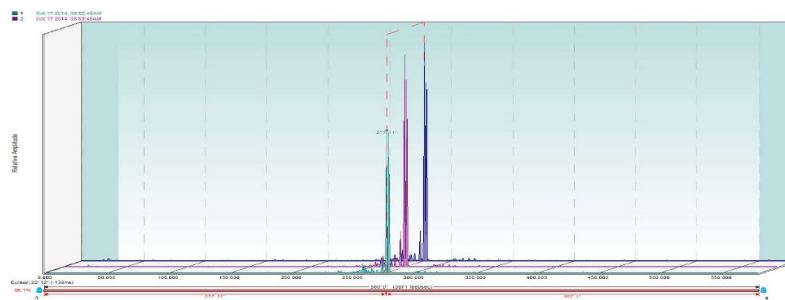
Department of Public Works, Water Department

Location: 6 Crestwood Drive, Service Leaking

Approx. Size: 1-3 GPM

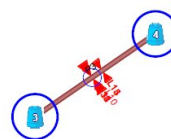
Weather: 61°F Fog, 10 MPH Wind

Date and time of detection on correlation: 10/17/2014 8:52 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P3	580' 0"	10"	Cast Iron	3571 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L10	277' 11" from 3	3 -> 4	98.1%	Oct 17 2014, 08:52:48AM
L11	277' 8" from 3	3 -> 4	98.4%	Oct 17 2014, 08:53:48AM
L12	278' 4" from 3	3 -> 4	98.4%	Oct 17 2014, 08:54:48AM
L13	325' 5" from 3	3 -> 5	92.2%	Oct 17 2014, 08:52:48AM
L14	325' 5" from 3	3 -> 5	92.5%	Oct 17 2014, 08:53:48AM
L15	325' 5" from 3	3 -> 5	91.0%	Oct 17 2014, 08:54:48AM
L34	277' 8" from 3	3 -> 4	98.4%	Oct 17 2014, 08:53:48AM
L35	278' 4" from 3	3 -> 4	98.4%	Oct 17 2014, 08:54:48AM





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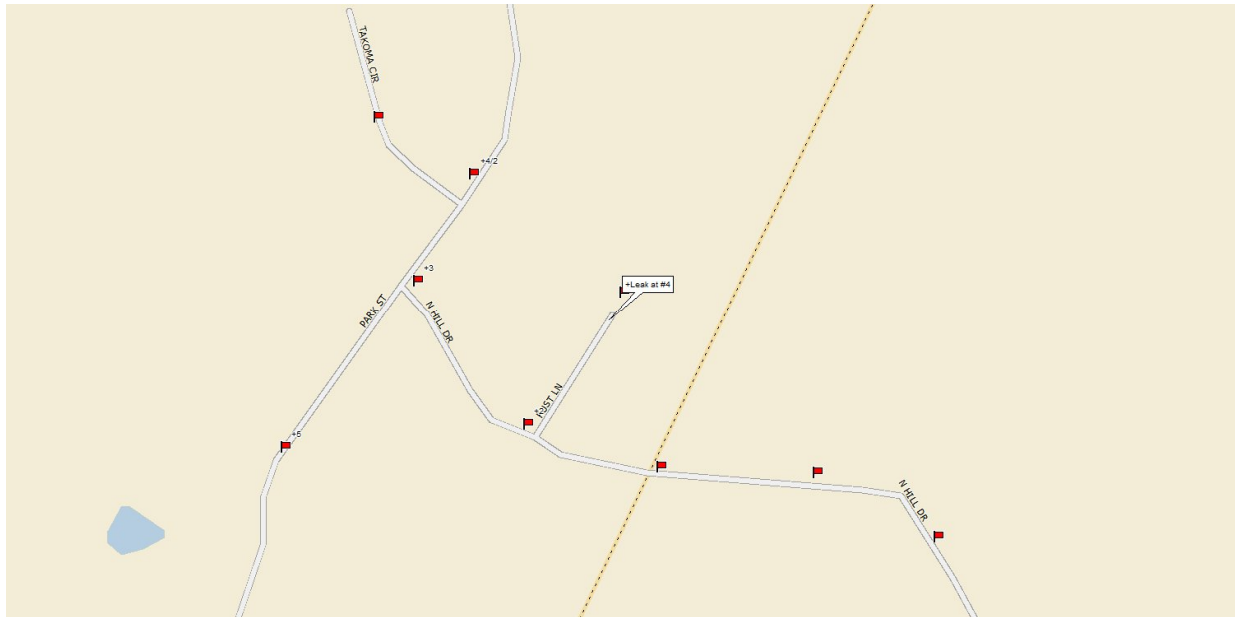
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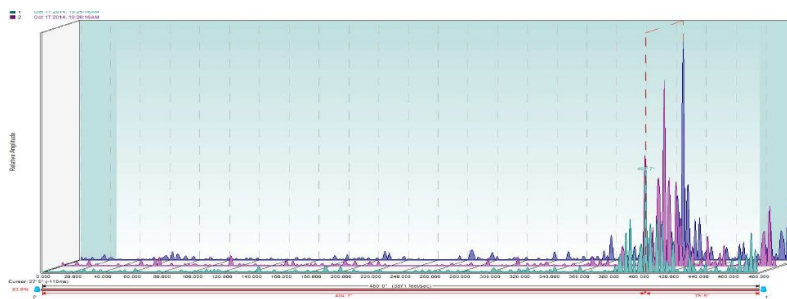
Department of Public Works, Water Department

Location: 4 Rust Lane, Service Leaking

Approx. Size: 2-4 GPM

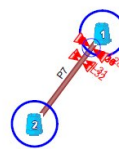
Weather: 65°F Clear, 13MPH Wind

Date and time of detection on correlation: 10/17/2014 10:25 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P7	480' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L28	404' 7" from 2	2 -> 1	83.5%	Oct 17 2014, 10:25:16AM
L29	404' 2" from 2	2 -> 1	85.6%	Oct 17 2014, 10:26:16AM
L30	404' 7" from 2	2 -> 1	87.2%	Oct 17 2014, 10:27:16AM
L31	137' 11" from 1	1 -> 3	79.2%	Oct 17 2014, 10:28:16AM
L32	150' 8" from 1	1 -> 3	74.6%	Oct 17 2014, 10:28:16AM
L34	404' 7" from 2	2 -> 1	85.5%	Oct 17 2014, 10:28:16AM
L35	404' 7" from 2	2 -> 1	87.2%	Oct 17 2014, 10:27:16AM



# Arthur Pyburn & Sons Inc.

## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

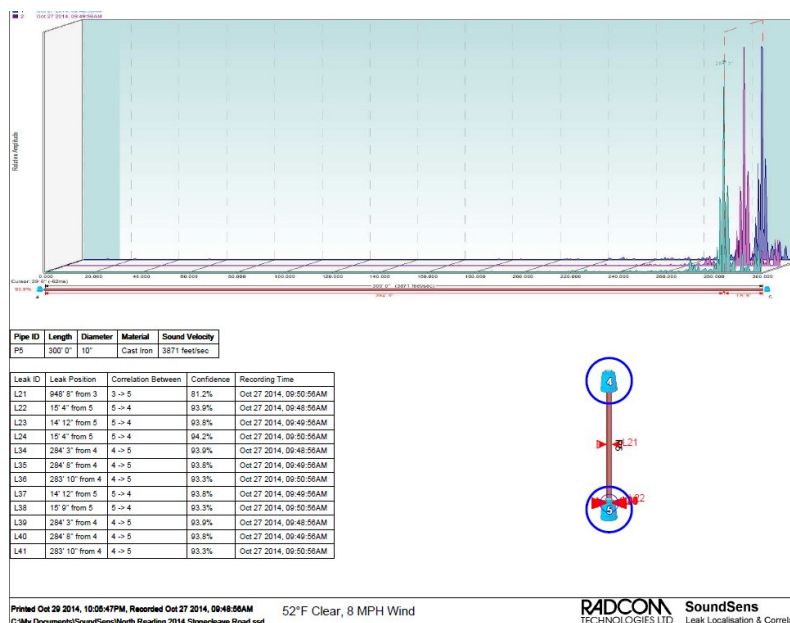
Department of Public Works, Water Department

Location: 7 Stonecleave Road, Service Leaking

Approx. Size: 1-3 GPM

Weather: 52°F Clear, 8MPH Wind

Date and time of detection on correlation: 10/27/2014 9:48 AM



# Arthur Pyburn & Sons Inc.

## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

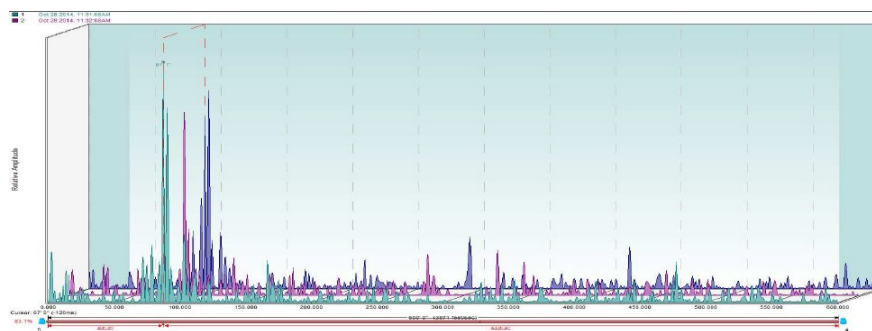
Department of Public Works, Water Department

Location: 8 School Hill Lane, Service Leaking

Approx. Size: 2-4 GPM

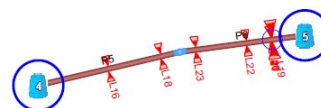
Weather: 57°F Clear, 12 MPH Wind

Date and time of detection on correlation: 10/29/2014 11:31 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P5	270' 0"	10"	Cast Iron	3871 feet/sec
P6	330' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L16	787' 8" from 3	3 → 4	72.0%	Oct 28 2014, 11:31:08AM
L18	687' 12" from 3	3 → 4	70.6%	Oct 28 2014, 11:33:08AM
L19	87' 7" from 5	5 → 4	83.1%	Oct 28 2014, 11:31:08AM
L20	88' 0" from 5	5 → 4	81.4%	Oct 28 2014, 11:32:08AM
L21	90' 5" from 5	5 → 4	83.0%	Oct 28 2014, 11:33:08AM
L22	154' 1" from 5	5 → 3	72.1%	Oct 28 2014, 11:31:08AM
L23	200' 4" from 5	5 → 3	69.8%	Oct 28 2014, 11:32:08AM
L40	88' 0" from 5	5 → 4	81.4%	Oct 28 2014, 11:32:08AM
L41	90' 5" from 5	5 → 4	83.0%	Oct 28 2014, 11:33:08AM

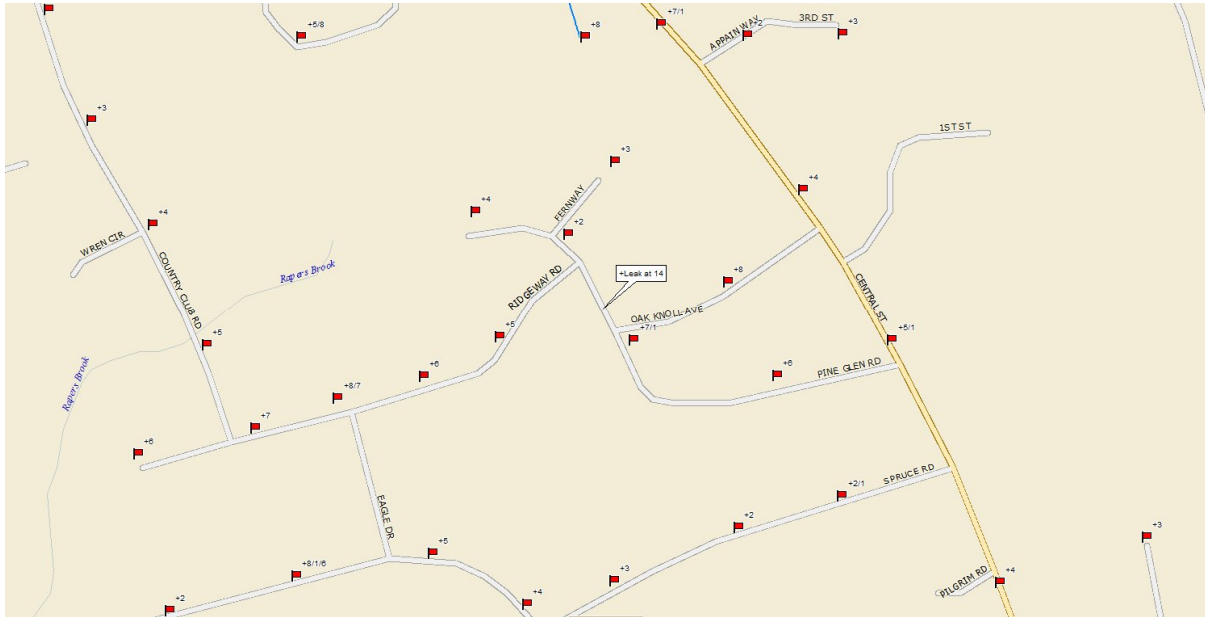


**Arthur Pyburn & Sons Inc.**  
**Technical Services**  
**Leak worksheet**

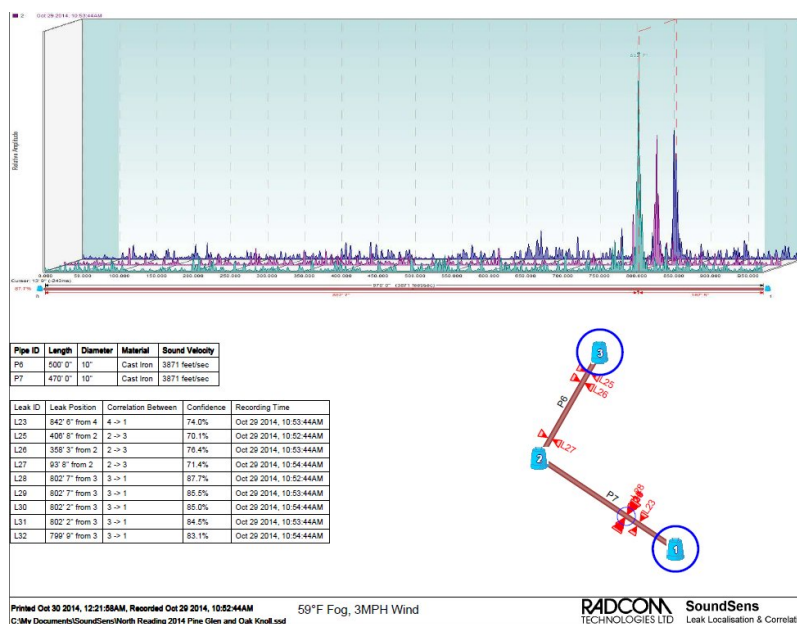
1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



**System Name:** Town of North Reading, Massachusetts  
**Department of Public Works, Water Department**  
**Location:** 14 Pine Glen Road, Service Leaking  
**Approx. Size:** 2-4 GPM  
**Weather:** 59°F Fog, 3MPH Wind  
**Date and time of detection on correlation:** 10/29/2014 10:52 AM



# Arthur Pyburn & Sons Inc.

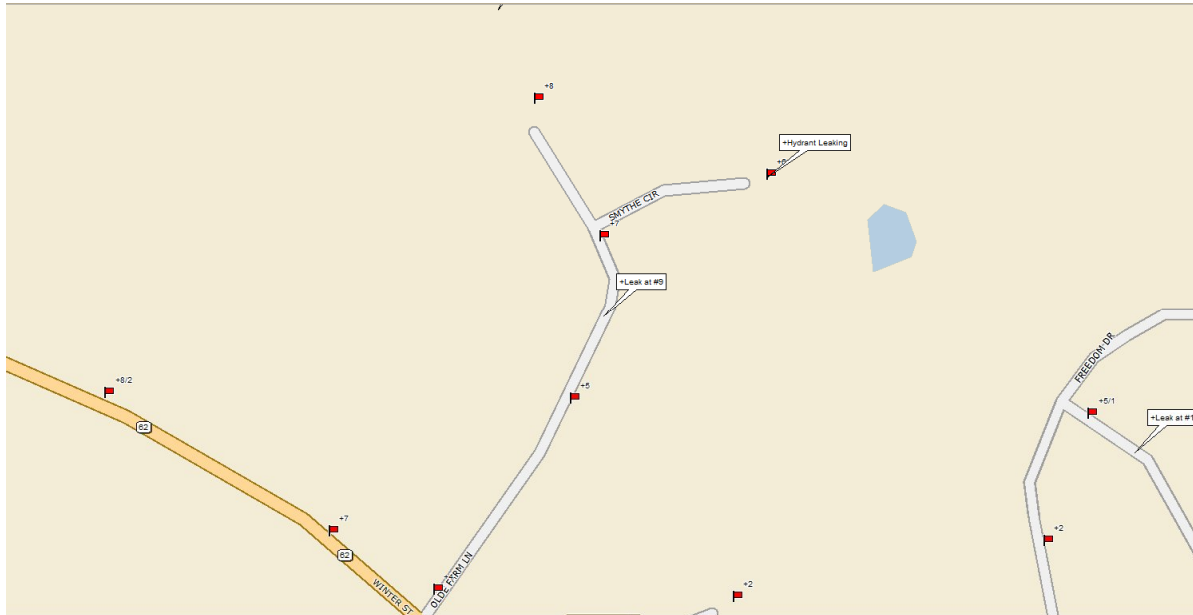
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

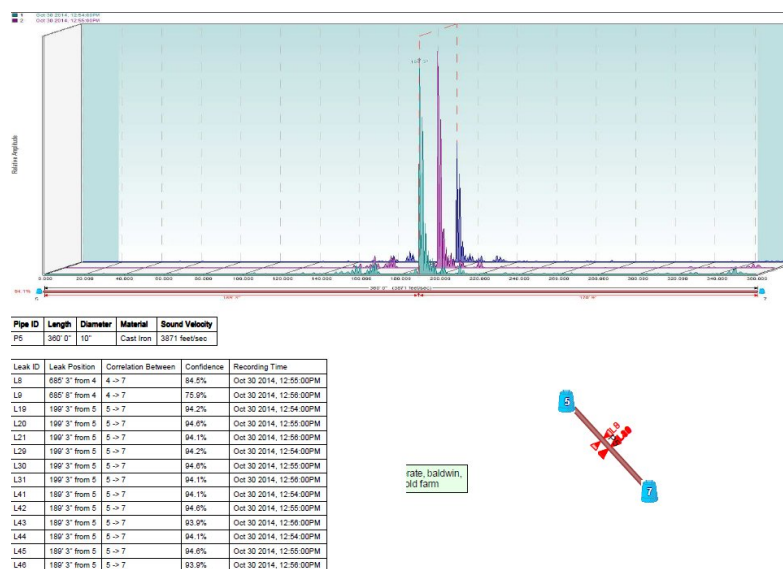
Department of Public Works, Water Department

Location: 9 Olde Farm Lane, Service Leaking

Approx. Size: 1-3 GPM

Weather: 57°F Partly Cloudy, 8MPH Wind

Date and time of detection on correlation: 10/30/2014 12:54 PM



Printed Nov 01 2014, 10:30:00PM, Recorded Oct 30 2014, 12:54:00PM  
C:\My Documents\SoundSens\North Reading 2014 Olde Farm Lane.ssd

57°F Partly Cloudy, 8MPH Wind

**RADCOM** SoundSens  
TECHNOLOGIES LTD Leak Localisation & Correlation

# Arthur Pyburn & Sons Inc.

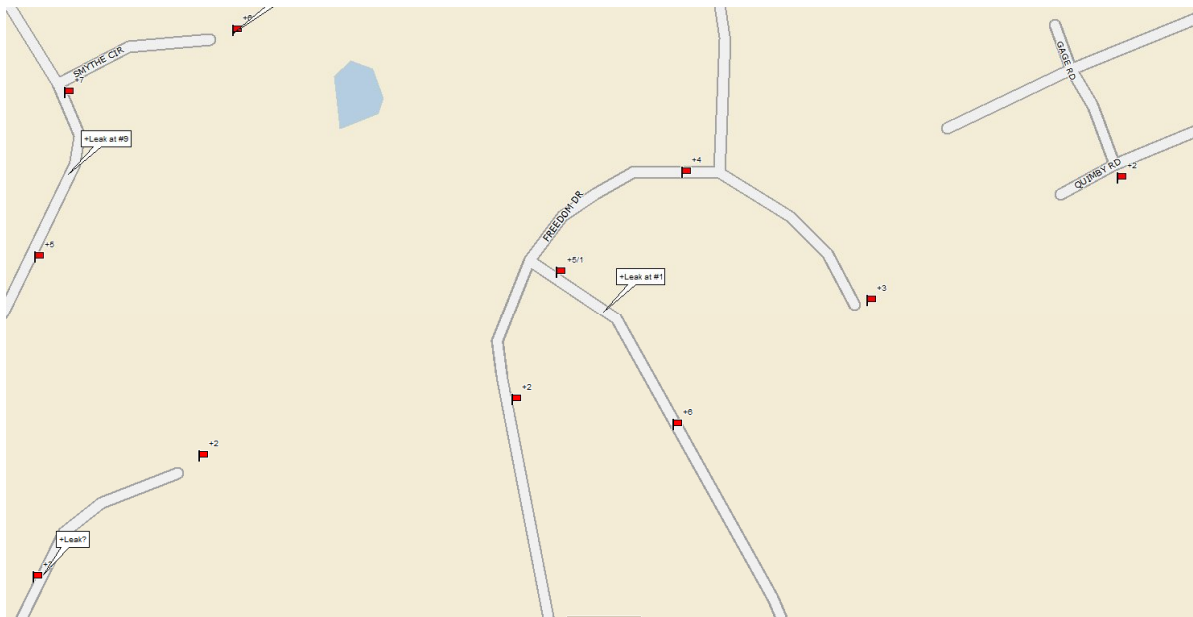
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

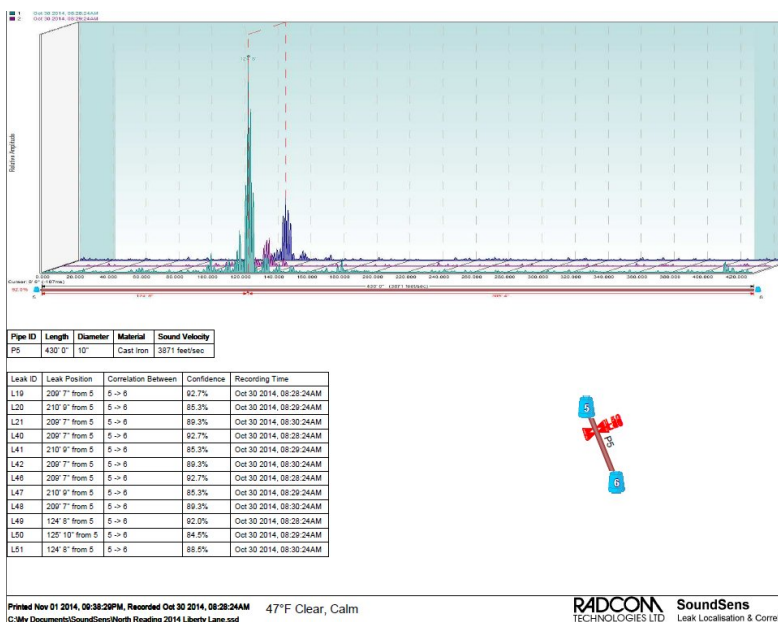
Department of Public Works, Water Department

Location: 1 Liberty Lane, Service Leaking, Need to expose curbstop using as-built; cannot locate with metal detector

Approx. Size: Unknown

Weather: 47°F Clear, Calm

Date and time of detection on correlation: 10/30/2014 8:28 AM





Arthur Pyburn & Sons Inc.

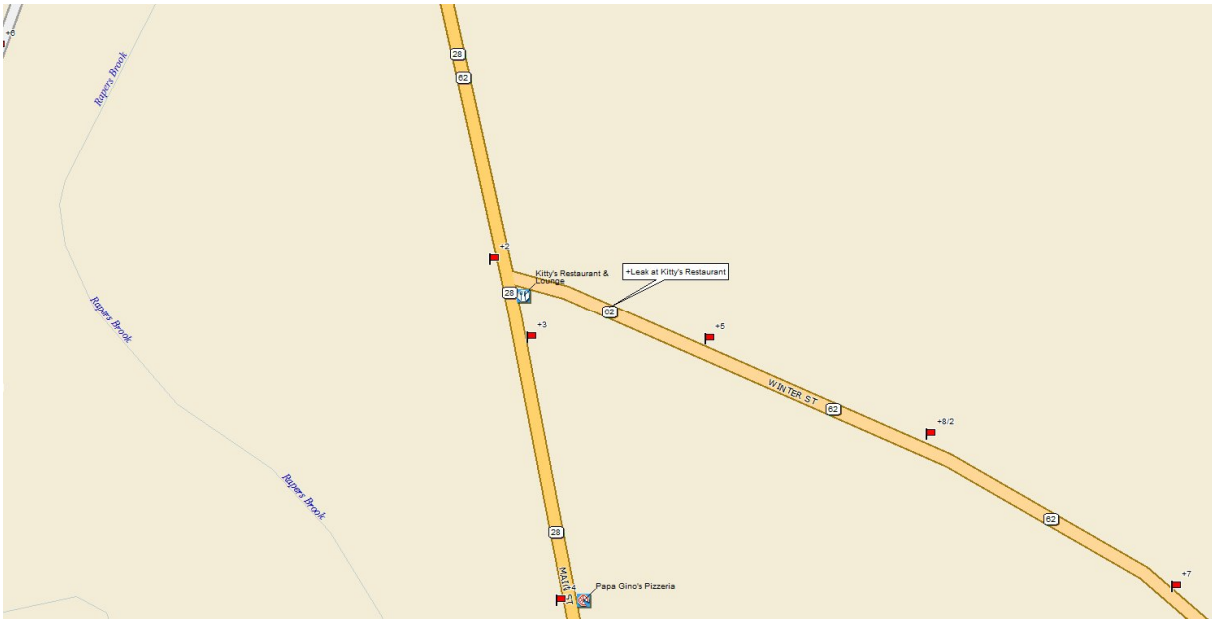
Technical Services

Leak worksheet

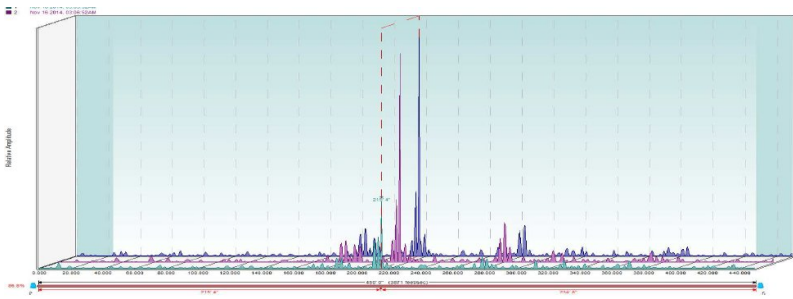
1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com

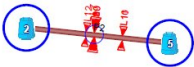


System Name: Town of North Reading, Massachusetts  
Department of Public Works, Water Department  
Location: Kitty's Restaurant Fire Service Leaking  
Approx. Size: 2-4 GPM  
Weather: 25°F Clear, Calm  
Date and time of detection on correlation: 11/16/2014 3:05 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P2	450' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L7	215' 4" from 2	2 -> 5	98.8%	Nov 16 2014, 03:05:52AM
L8	215' 4" from 2	2 -> 5	90.9%	Nov 16 2014, 03:06:52AM
L9	215' 4" from 2	2 -> 5	90.9%	Nov 16 2014, 03:07:52AM
L10	149' 9" from 5	5 -> 3	80.7%	Nov 16 2014, 03:05:52AM
L11	149' 9" from 5	5 -> 3	82.1%	Nov 16 2014, 03:06:52AM
L12	263' 8" from 5	5 -> 3	80.0%	Nov 16 2014, 03:07:52AM
L19	215' 4" from 2	2 -> 5	90.6%	Nov 16 2014, 03:06:52AM
L20	215' 4" from 2	2 -> 5	90.9%	Nov 16 2014, 03:07:52AM



# Arthur Pyburn & Sons Inc.

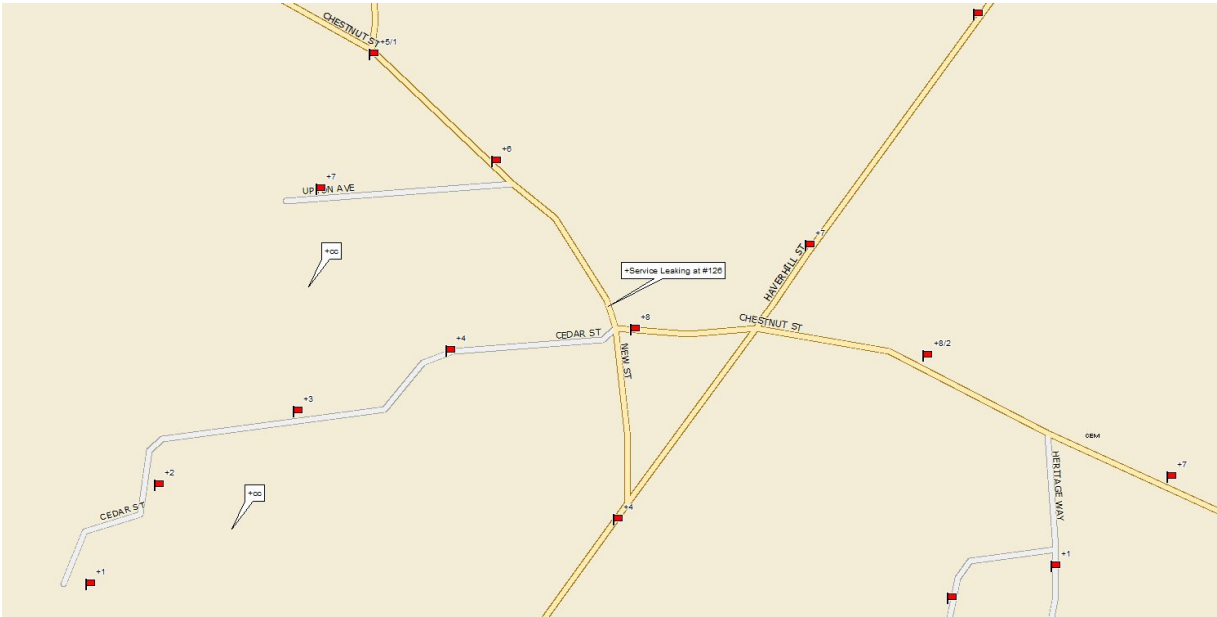
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** 126 Chestnut Street, Service Leaking

**Approx. Size:** 2-4 GPM

**Weather:** 51°F Fog, Calm

**Date and time of detection:** 11/12/2014 3:07AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.



# Arthur Pyburn & Sons Inc.

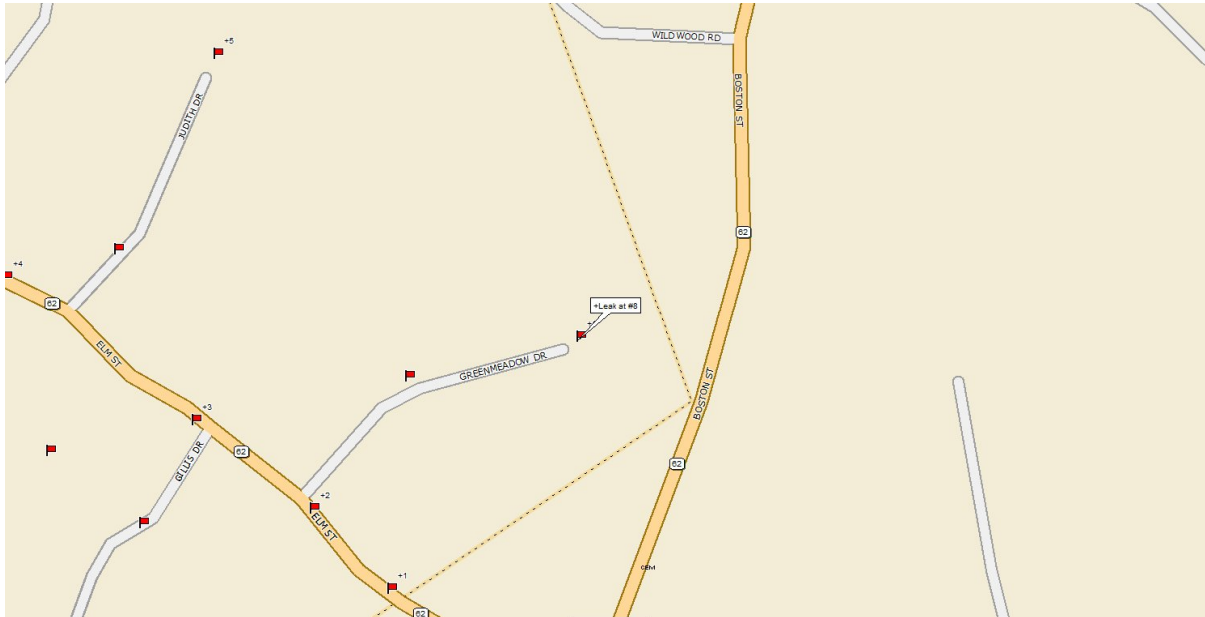
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** 8 Green Meadow Drive, Service Leaking

**Approx. Size:** 1-3 GPM

**Weather:** 65°F Mostly Cloudy 10MPH Wind

**Date and time of detection:** 10/7/2014 10:26 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

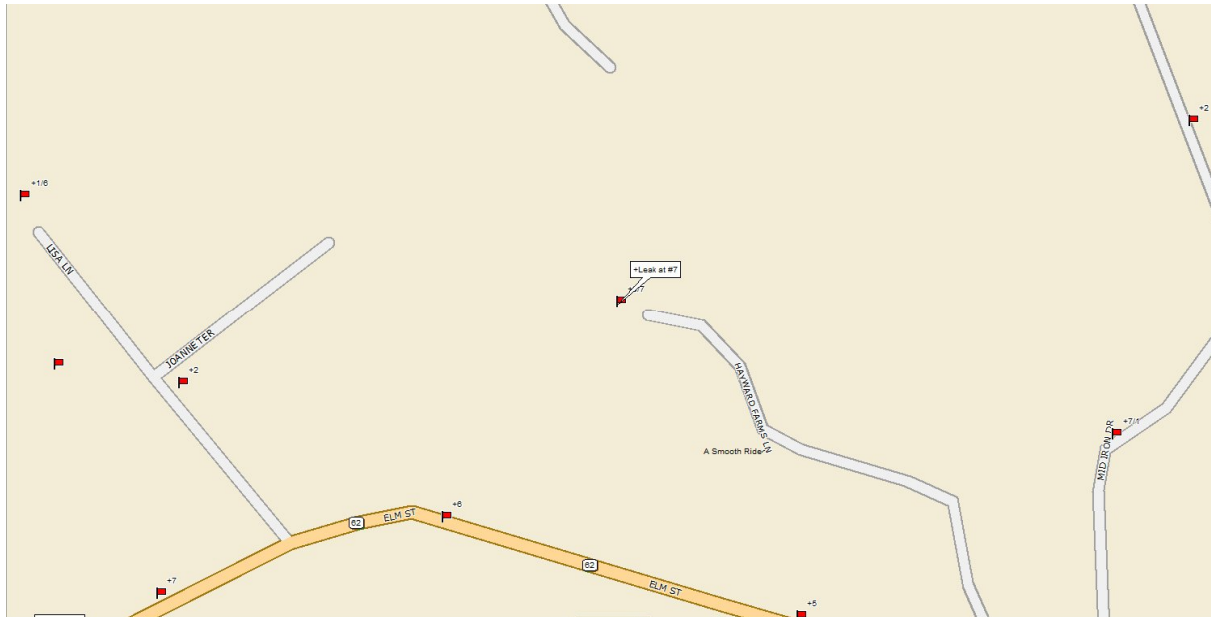
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** 7 Hayward Farms Lane, Service Leaking

**Approx. Size:** 2-4 GPM

**Weather:** 65°F Mostly Cloudy, 10 MPH Wind

**Date and time of detection:** 10/10/2014 10:26 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

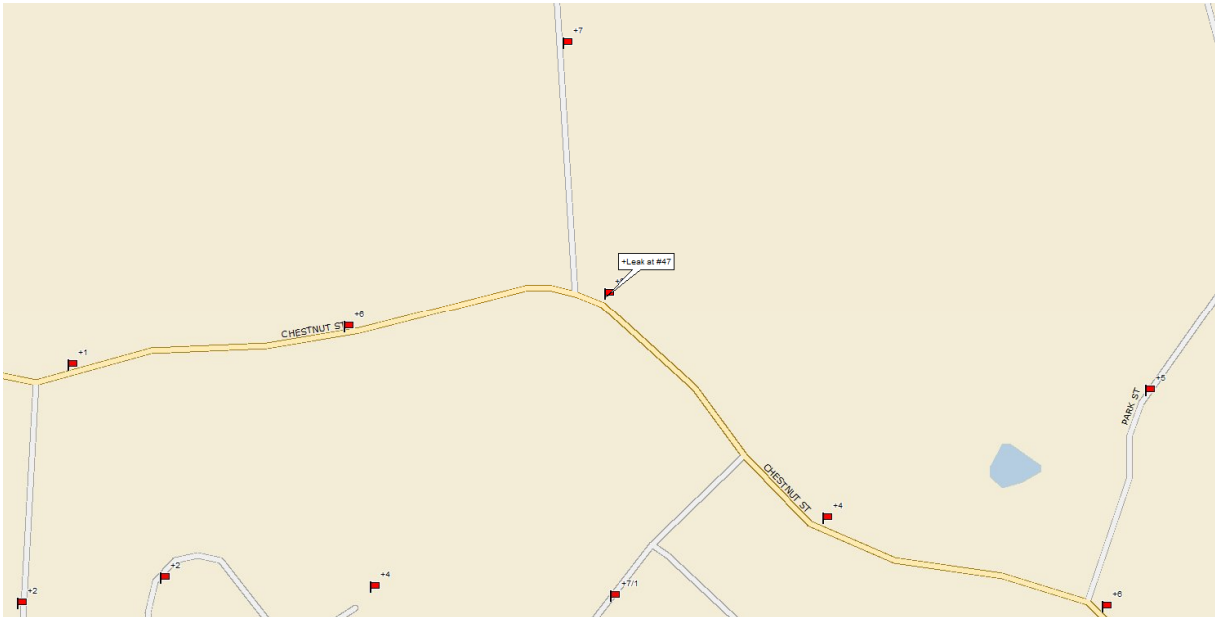
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

Department of Public Works, Water Department

Location: 47 Chestnut Street, Service Leaking

Approx. Size: 2-4 GPM

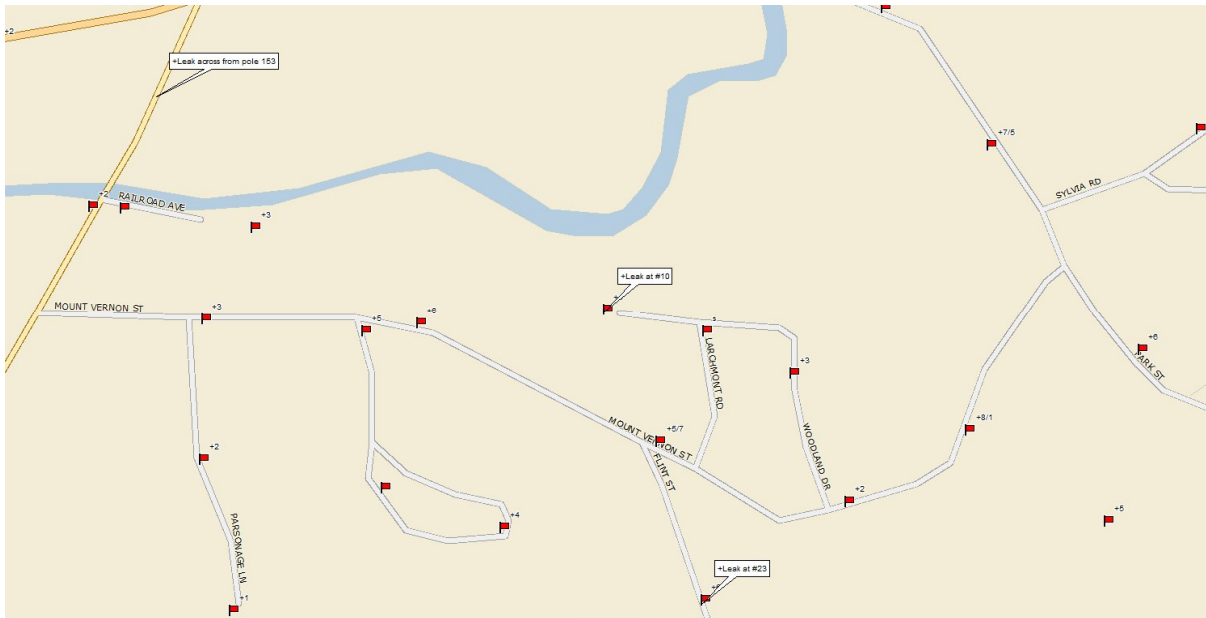
Weather: 58°F Clear, 3MPH Wind

Date and time of detection: 10/20/2014 12:36 PM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Leak worksheet

**gpyburn@apsitech.com**



Date and time of detection: 10/28/2014 2:11 PM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

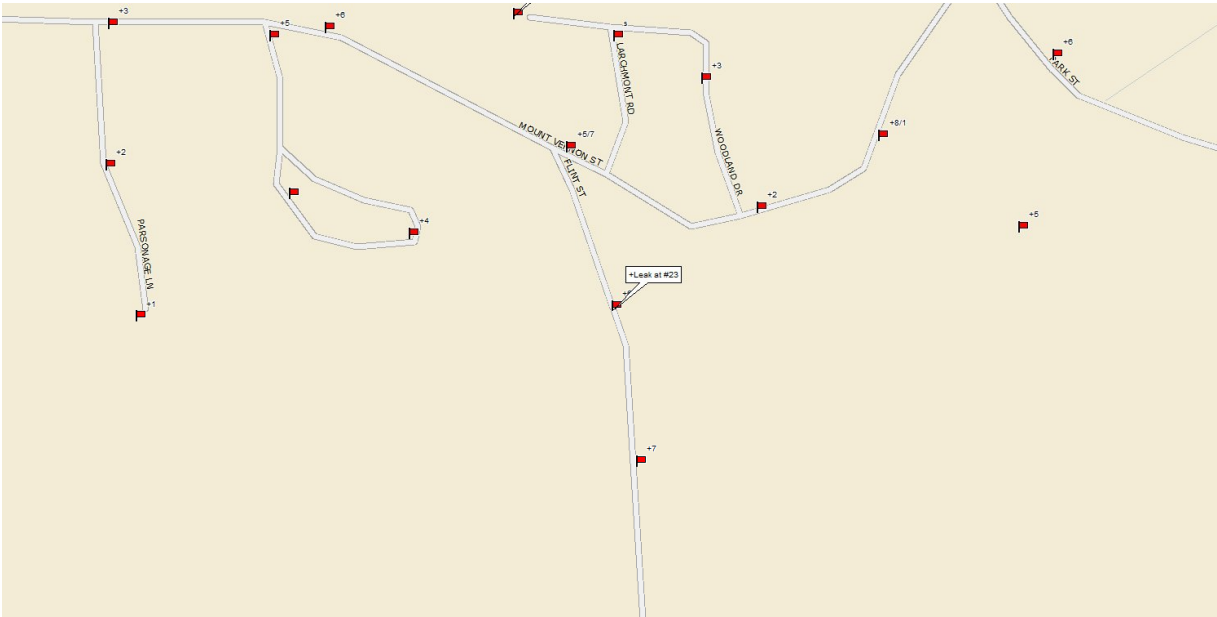
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

Department of Public Works, Water Department

Location: 23 Flint Street, Service Leaking

Approx. Size: 1-3 GPM

Weather: 54°F Clear, Calm

Date and time of detection: 10/20/2014 3:12 PM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

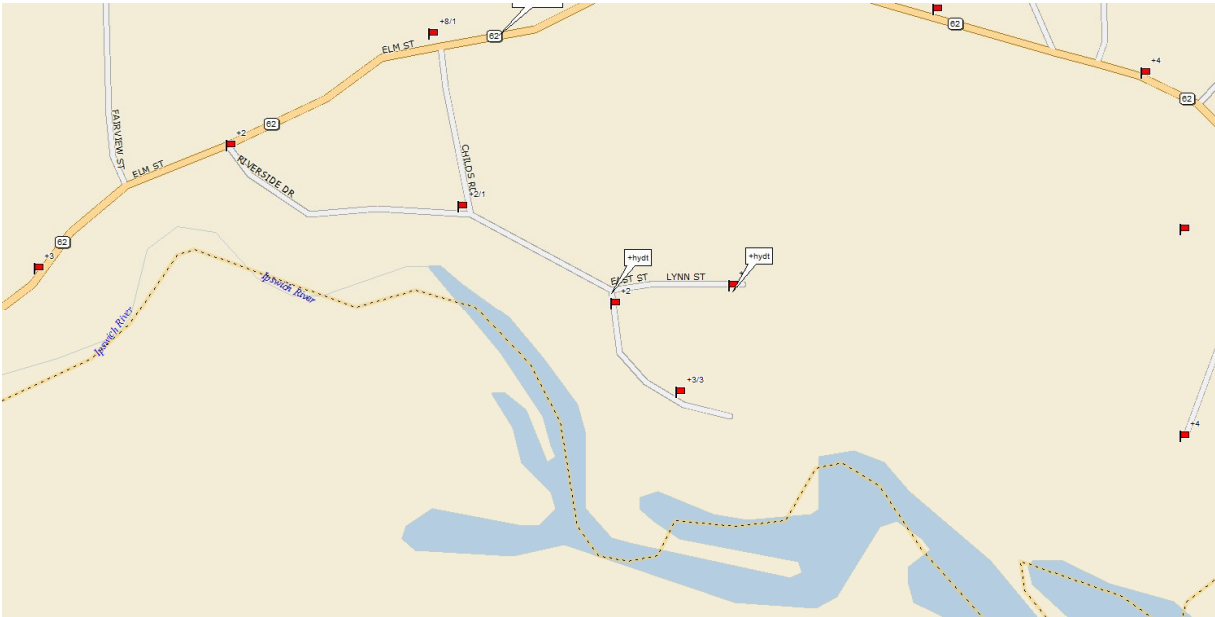
## Technical Services

### Leak worksheet

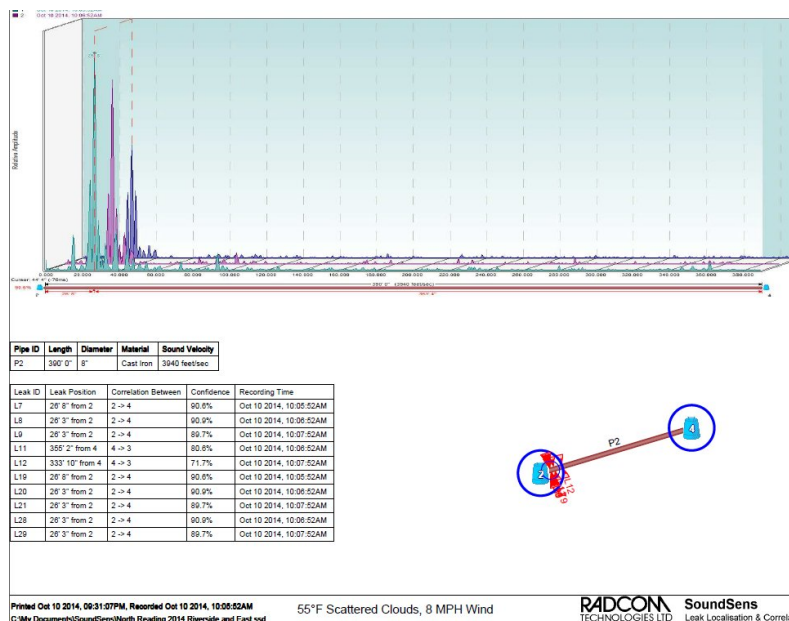
1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



**System Name:** Town of North Reading, Massachusetts  
**Department of Public Works, Water Department**  
**Location:** Hydrant at intersection of Riverside Drive and East Street  
**Approx. Size:** ½-1 GPM  
**Weather:** 55°F Scattered Clouds, 8MPH Wind  
**Date and time of detection on correlation:** 10/10/2014 10:05 AM



**Arthur Pyburn & Sons Inc.**  
**Technical Services**  
**Leak worksheet**

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts  
**Department of Public Works, Water Department**  
**Location:** Hydrant across from 7 East Street  
**Approx. Size:** 1-2 GPM  
**Weather:** 55°F Scattered Clouds, 8MPH Wind  
**Date and time of detection:** 10/10/2014 10:05 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** Hydrant by Marblehead and Ten Rod Road across from 96 Marblehead

**Approx. Size:** ½-1 GPM

**Weather:** 39°F Clear, 6 MPH Wind

**Date and time of detection:** 10/12/2014 6:46 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.



# Arthur Pyburn & Sons Inc.

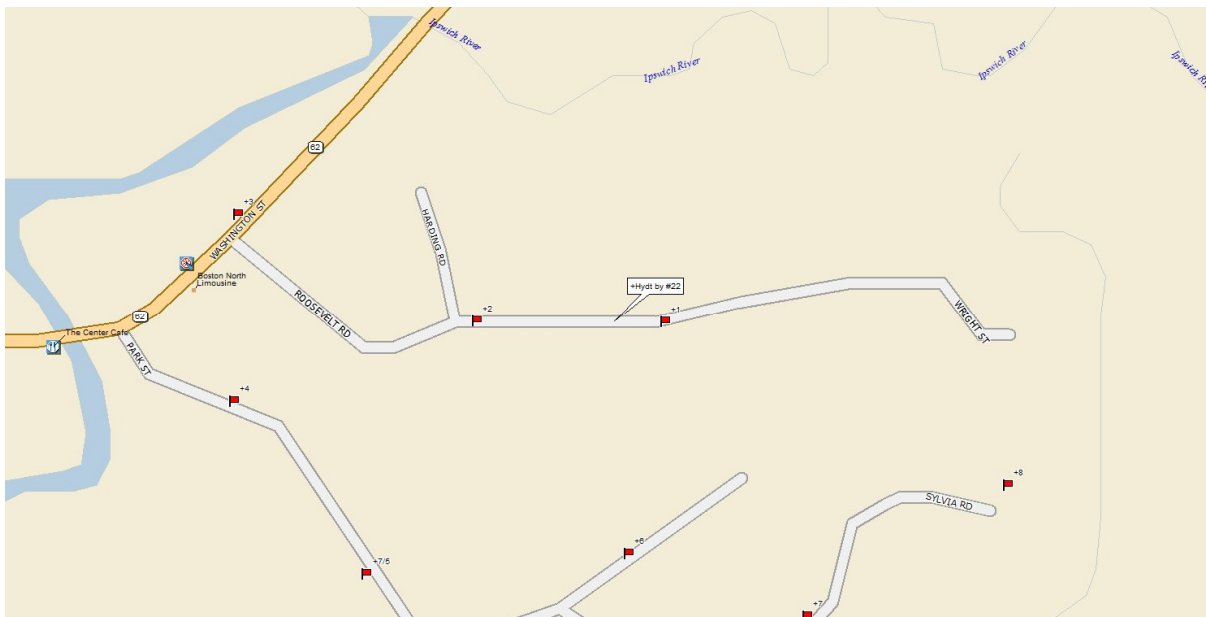
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

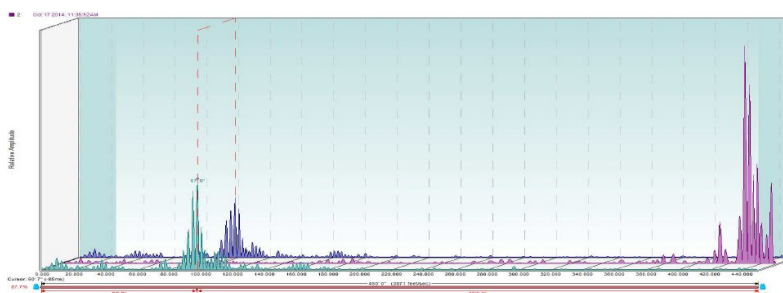
Department of Public Works, Water Department

Location: Hydrant by 22 Wright Street

Approx. Size: 1/2-1 GPM

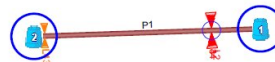
Weather: 69°F Few Clouds, 13 MPH Wind

Date and time of detection on correlation: 10/17/2014 11:36 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P1	430' 2"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L1	430' 2" from 1	1 -> 2	90.0%	Oct 17 2014, 11:35:52AM
L2	97' 9" from 1	1 -> 2	87.7%	Oct 17 2014, 11:36:52AM
L3	97' 9" from 1	1 -> 2	85.8%	Oct 17 2014, 11:37:52AM
L43	430' 2" from 1	1 -> 2	90.0%	Oct 17 2014, 11:35:52AM
L44	97' 9" from 1	1 -> 2	85.8%	Oct 17 2014, 11:37:52AM



# Arthur Pyburn & Sons Inc.

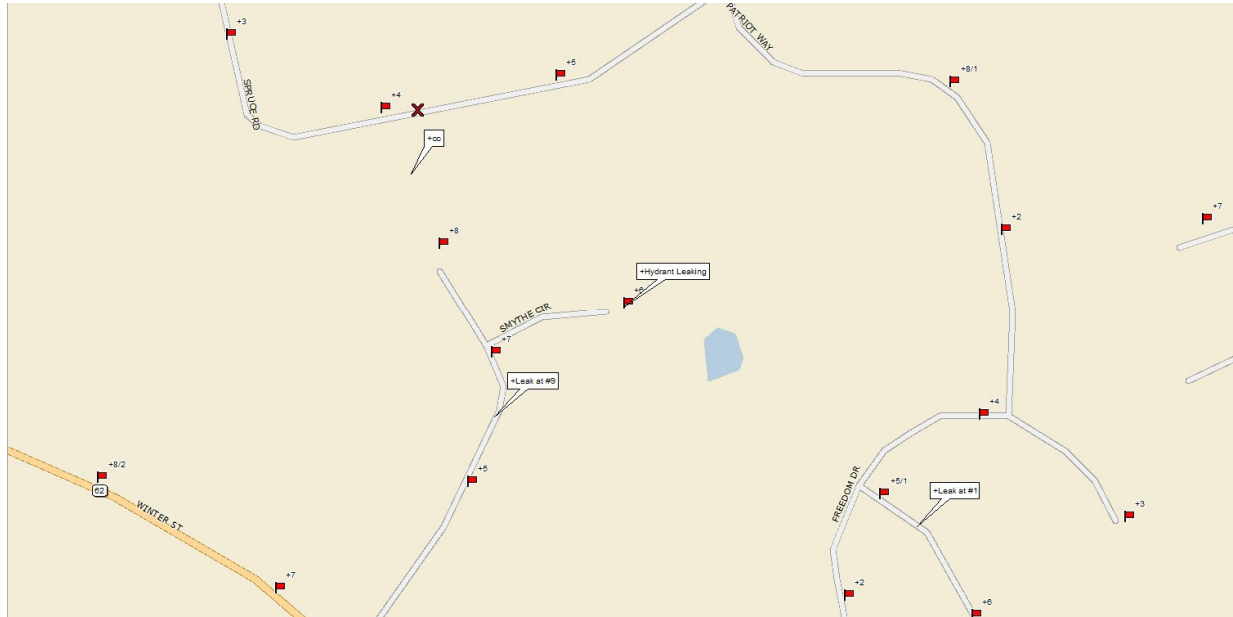
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

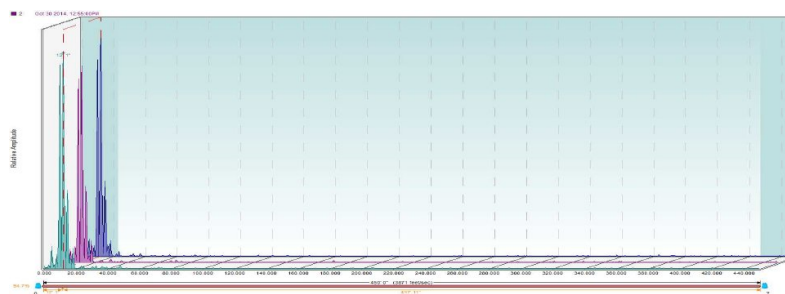
Department of Public Works, Water Department

Location: Hydrant at the end of Smythe Circle

Approx. Size: 1-2 GPM

Weather: 57°F Partly Cloudy, 8 MPH Wind

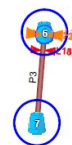
Date and time of detection on correlation: 10/30/2014 12:54 PM



Pipe ID	Length	Diameter	Material	Sound Velocity
P3	450' 0"	10"	Cast Iron	3871 feet/sec

Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L10	12' 1" from 6	6 → 7	94.7%	Oct 30 2014, 12:54:00PM
L11	12' 6" from 6	6 → 7	94.6%	Oct 30 2014, 12:55:00PM
L12	12' 6" from 6	6 → 7	94.6%	Oct 30 2014, 12:55:00PM
L13	92' 3" from 6	6 → 8	95.2%	Oct 30 2014, 12:54:00PM
L14	92' 7" from 6	6 → 8	93.8%	Oct 30 2014, 12:55:00PM
L15	92' 3" from 6	6 → 8	95.3%	Oct 30 2014, 12:55:00PM
L22	12' 1" from 6	6 → 7	94.6%	Oct 30 2014, 12:55:00PM
L23	12' 1" from 6	6 → 7	94.7%	Oct 30 2014, 12:55:00PM

R.



# Arthur Pyburn & Sons Inc.

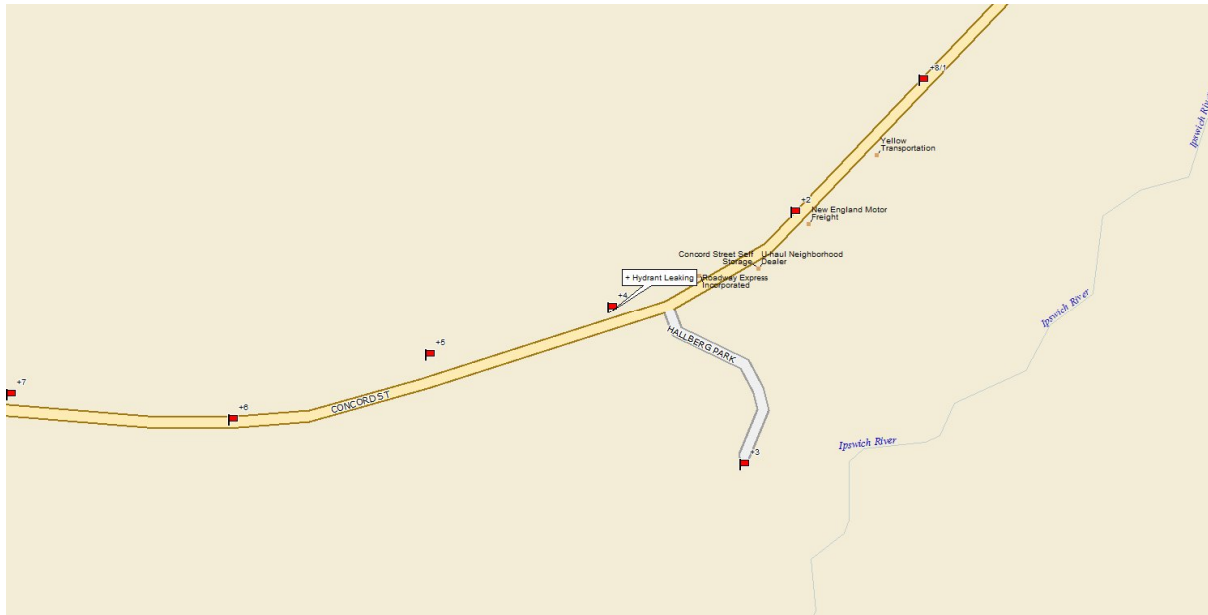
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** Hydrant leaking by 73 Concord Street

**Approx. Size:** ½ -1 GPM

**Weather:** 48°F Clear, 3 MPH Wind

**Date and time of detection:** 10/20/2014 11:05 PM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



System Name: Town of North Reading, Massachusetts

Department of Public Works, Water Department

Location: Hydrant by 9 Laurel Road

Approx. Size: 1/2 - 1 GPM

Weather: 63°F Overcast, 13 MPH Wind

Date and time of detection: 10/17/2014 10:02 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

**Arthur Pyburn & Sons Inc.**  
Technical Services  
Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



**System Name:** Town of North Reading, Massachusetts  
**Department of Public Works, Water Department**  
**Location:** Hydrant by 19 Shady Hill Drive  
**Approx. Size:** ½-1 GPM  
**Weather:** 54°F Mostly Cloudy, 10 MPH Wind  
**Date and time of detection:** 10/28/2014 9:53 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

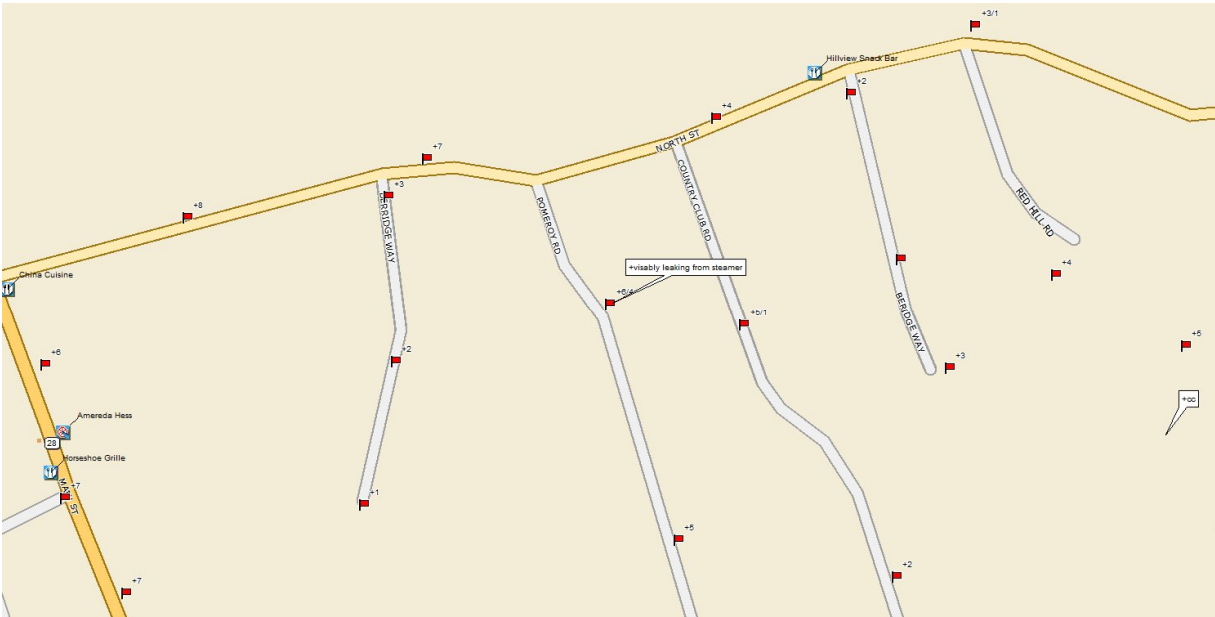
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



System Name: Town of North Reading, Massachusetts

Department of Public Works, Water Department

Location: Hydrant by approx. 6 Pomeroy Road

Approx. Size: 1-2 GPM

Weather: 55°F Fog, 3MPH Wind

Date and time of detection: 10/29/2014 9:45 AM

Leak detected visually. No Correlations Available.

# Arthur Pyburn & Sons Inc.

## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts

Department of Public Works, Water Department

Location: Hydrant by 27 Southwick Road

Approx. Size: ½-1 GPM

Weather: 51°F Mostly Cloudy, 6 MPH Wind

Date and time of detection: 10/31/2014 11:28 AM

Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.

# Arthur Pyburn & Sons Inc.

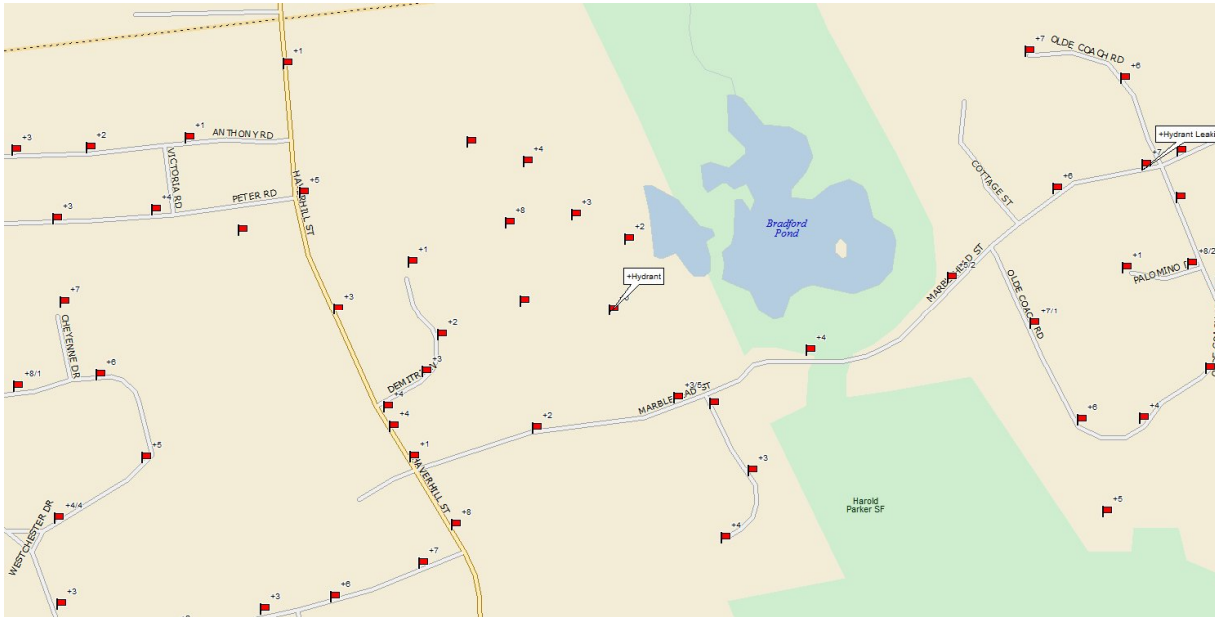
## Technical Services

### Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646

[gpyburn@apsitech.com](mailto:gpyburn@apsitech.com)



**System Name:** Town of North Reading, Massachusetts

**Department of Public Works, Water Department**

**Location:** Hydrant on Little Meadow Way on the right side of the fork coming into the development

**Approx. Size:** ½-1 GPM

**Weather:** 40°F Mostly Cloudy, 12 MPH Wind

**Date and time of detection:** 11/14/2014 11:32 AM

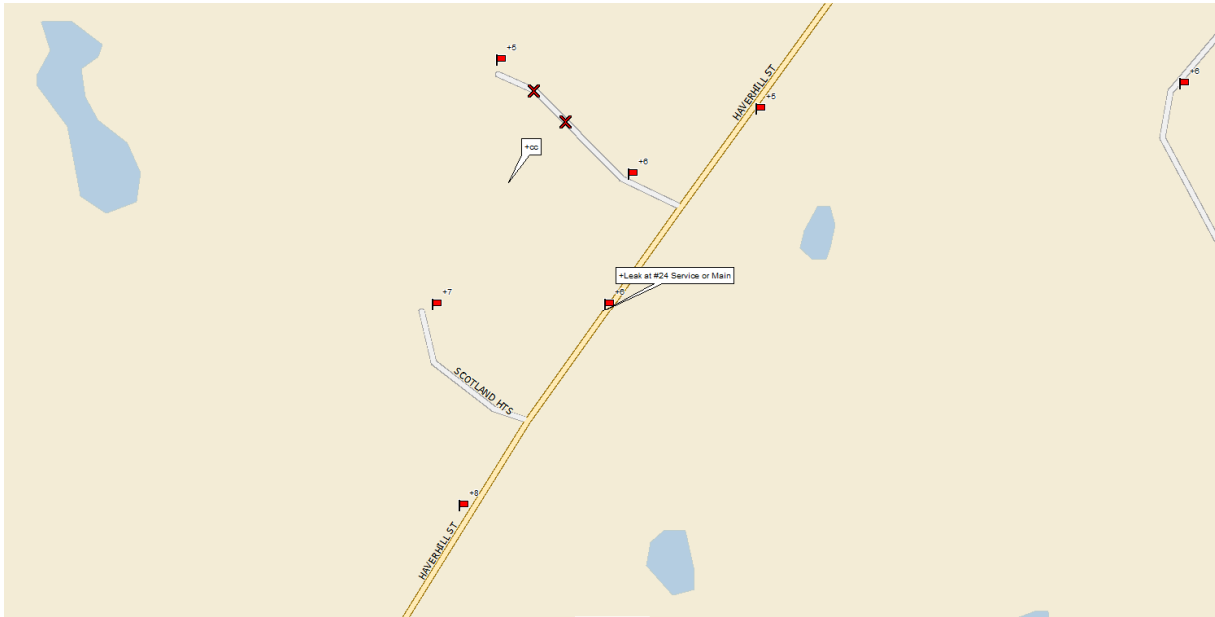
Leak detected during the audit of noise logger recordings. No correlations available. Located using ground microphone.



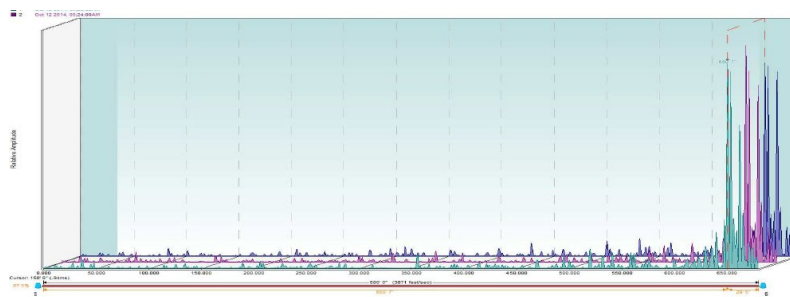
**Arthur Pyburn & Sons Inc.**  
**Technical Services**  
**Leak worksheet**

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646  
gppyburn@apsitech.com

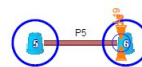


**System Name:** Town of North Reading, Massachusetts  
**Department of Public Works, Water Department**  
**Location:** Service or main leak by 24 Haverhill Street  
**Approx. Size:** 1-2 GPM  
**Weather:** 37°F Clear, 6MPH Wind  
**Date and time of detection on correlation:** 10/12/2014 5:23 AM



Pipe ID	Length	Diameter	Material	Sound Velocity
P5	650' 0"	10"	Cast Iron	3871 feet/sec

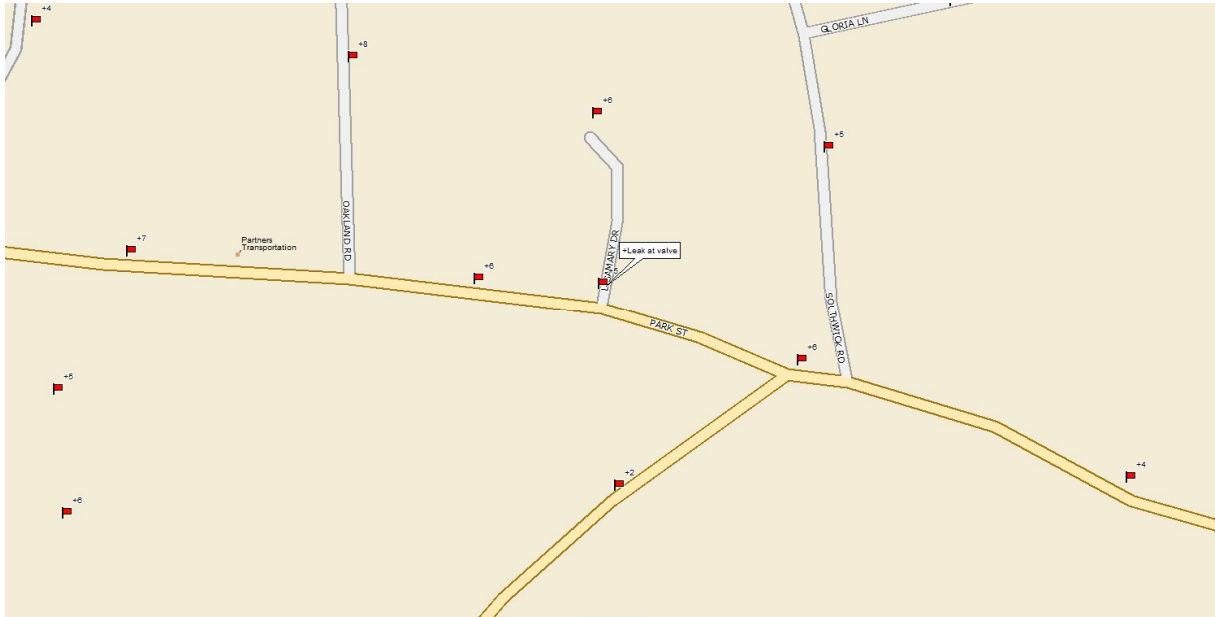
Leak ID	Leak Position	Correlation Between	Confidence	Recording Time
L19	650' 7" from 5	5 -> 6	87.5%	Oct 12 2014, 05:23:00AM
L20	650' 7" from 5	5 -> 6	88.0%	Oct 12 2014, 05:24:00AM
L21	650' 7" from 5	5 -> 6	87.8%	Oct 12 2014, 05:25:00AM
L37	650' 7" from 5	5 -> 6	88.0%	Oct 12 2014, 05:26:00AM
L38	650' 7" from 5	5 -> 6	87.4%	Oct 12 2014, 05:26:00AM



**Arthur Pyburn & Sons Inc.**  
Technical Services  
Leak worksheet

1065 Summer Street ♦ Lynnfield, MA 01940

Phone (617) 529-3646  
gpyburn@apsitech.com



System Name: Town of North Reading, Massachusetts  
Department of Public Works, Water Department  
Location: Believed to be a mechanical joint on valve for Lisamary Drive  
Approx. Size: 4-8 GPM  
Weather: 51°F Mostly Cloudy, 6 MPH Wind  
Date and time of detection on correlation: 10/31/2014 11:55 AM

