



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



**Thomas S. Burack, Commissioner**

**~Request for Proposals~**  
**Leak Detection Surveys at NH Community Water Systems**  
**August, 2014**

**I. Introduction**

The New Hampshire Department of Environmental Services (DES) is requesting proposals for leak detection surveys at twenty-six community water systems in New Hampshire during the 2015 field season. The purpose of the surveys is to reduce water and revenue loss by assisting water systems with leak identification and location. Projects range in size from entire distribution systems to portions thereof with the total length of pipe proposed to be surveyed spanning approximately 737 miles. Leak detection projects that are selected will be funded through a set aside of the Drinking Water State Revolving Fund (DWSRF).

**II. Background**

In June of 2014, DES sent leak detection project solicitations to all community water systems in New Hampshire. A copy of the solicitation is attached. Twenty-six responses were received. The survey requests that are selected for funding will be determined, in part, based on the total costs provided by the proposals. A general summary of the systems requesting leak detection assistance may be found in the tables below. The number of miles was derived based on estimates provided by the water systems and is intended for guidance only and should not be the sole determinant of contract price for each project.

PROJECT REQUEST				SURVEY MILES BY PIPE MATERIAL				PROJECT CONTACT	
PWSID	WATER SYSTEM	Town	PERCENT	UNDIFFER-			TOTAL	NAME	PHONE
				METAL	NONMETAL	ENTIATED			
0201010	Belmont Water Department	Belmont	10.0%	4.50	0.00	0.00	4.50	Jim Fortin	(603) 529-2677
0241010	Bethlehem Village District	Bethlehem	50.0%	12.10	0.00	0.00	12.10	Derek Brown	(603) 869-3440 / (603) 616-2320
0501010	City of Concord Project A	Concord	15.0%	30.00	0.00	0.00	30.00	Phil Bilodeau	(603) 228-2737
0501010	City of Concord Project B	Concord	15.0%	31.25	0.00	0.00	31.25	Phil Bilodeau	(603) 228-2737
1321010	City of Lebanon Water Department	Lebanon	56.0%	43.30	0.00	0.00	43.30	Jim Angers	office (603) 448-2514 cell 359-7072
0481010	Colebrook Water Works	Colebrook	88.0%	6.75	0.75	0.00	7.50	April Hyde	(603) 237-8019
1141020	Emerald Lake Village District	Hillsborough	83.0%	0.00	11.70	0.00	11.70	John Dahood, Chairpers	(603) 428-3525 / (603) 848-3525
0761010	Epping Water Department	Epping	77.0%	4.65	0.00	0.00	4.65	Dennis Koch	(603) 679-5441 ext 4
1032090	Glenwood North	Hampstead	100.0%	0.00	0.00	0.20	0.20	Daniel Wojcik Jr.	(603) 913-2375
0991010	Greenville Water	Greenville	50.0%	0.50	4.50	0.00	5.00	Gerald Curran	(603) 878-1338
0881020	Gunstock Acres Village Water District	Gilford	90.0%	11.00	3.00	0.00	14.00	Alex Crawshaw	(603) 293-8580
1241010	Keene Water Department	Keene	53.0%	64.40	0.00	0.00	64.40	Donna Hanscom	(603) 352-6550
1281010	Laconia Water Department	Laconia	15.0%	11.00	1.00	0.00	12.00	Drew McKeen	(603) 524-0901
0202010	Lakeland	Belmont	100.0%	10.00	0.00	0.00	10.00	Alex Crawshaw	(603) 293-8580
1973060	Leisure Village	Raymond	100.0%	0.00	3.00	0.00	3.00	Chris Kofer	(603) 234-2770
1471010	Manchester Water Works	Manchester	60.0%	300.00	0.00	0.00	300.00	Guy R Chabot	(603) 624-6494 ext 2801
1531010	Merrimack Village District	Merrimack	23.0%	29.00	5.00	5.00	39.00	David Fredrickson	(603) 424-9241 ext 108
1581010	Milton Water District	Milton	100.0%	5.50	1.50	0.00	7.00	Steve Elliot	(603) 652-7469
0162270	Nordic Village	Bartlett	100.0%	0.00	1.00	0.00	1.00	Francis X. Lyons	(603) 356-6767
0251010	Penacook-Boscawen Water Precinct	Boscawen	50.0%	5.00	15.00	0.00	20.00	Peter Minen	(603) 545-5681
1971010	Raymond Water Department	Raymond	100.0%	15.00	0.19	0.00	15.19	Scott Kesbly	(603) 895-4657
0382010	Rosebrook	Carroll	100.0%	11.00	1.00	1.00	13.00	Nancy Oleson	(603) 278-4491
2041010	Rye Water District	Rye	100.0%	40.50	0.20	0.00	40.70	Ken Aspen	(603) 436-2596
1163010	Town Line Village	Holderness	100.0%	0.00	1.50	0.00	1.50	Barry Chamber	(603) 536-9712
1221010	Town of Jaffrey	Jaffrey	100.0%	37.10	2.69	1.57	41.36	Randall Heglin / Doug St	(603) 532-6521
0262020	White Rock Water	Tilton	100.0%	0.00	5.00	0.00	5.00	Alex Crawshaw	(603) 293-8580
			<b>Total</b>	<b>672.55</b>	<b>57.03</b>	<b>7.77</b>	<b>737.35</b>		

PWSID	WATER SYSTEM	Town	Fire	Total Connections
0761010	Epping Water Department	Epping	Y	545
1221010	Town of Jaffrey	Jaffrey	Y	1445
1241010	Keene Water Department	Keene	Y	6,100
1321010	City of Lebanon Water Department	Lebanon	Y	3,406
0162270	Nordic Village	Bartlett	N	126
1971010	Raymond Water Department	Raymond	Y	1,200
0241010	Bethlehem Village District	Bethlehem	Y	500
0201010	Belmont Water Department	Belmont	Y	645
1471010	Manchester Water Works	Manchester	Y	31,000
0251010	Penacook-Boscawen Water Precinct	Boscawen	Y	1,137
0481010	Colebrook Water Works	Colebrook	Y	480
1163010	Town Line Village	Holderness	N	77
0881020	Gunstock Acres Village Water District	Gilford	N	576
0202010	Lakeland	Belmont	N	158
0262020	White Rock Water	Tilton	N	95
1032090	Glenwood North	Hampstead	N	20
2041010	Rye Water District	Rye	Y	1,560
1973060	Leisure Village	Raymond	N	126
0501010	City of Concord Project A	Concord	Y	12,000
0501010	City of Concord Project B	Concord	Y	12,000
1531010	Merrimack Village District	Merrimack	Y	8,730
1141020	Emerald Lake Village District	Hillsborough	N	520
0991010	Greenville Water	Greenville	Y	440
1581010	Milton Water District	Milton	Y	350
1281010	Laconia Water Department	Laconia	Y	6,200
0382010	Rosebrook	Carroll	Y	407

### III. Scope of Work

The work will consist of performing acoustic listening surveys on the distribution systems of the water systems selected from the list identified above. The surveys shall be conducted in accordance with “Manual of Water Supply Practices, Water Audits and Loss Control Programs” document identification number AWWA M36, American Water Works Association, 2009. Surveys must be performed in two phases: an initial screening of the area to identify suspect leaks followed by a pinpointing phase to locate the suspected leak. A detailed report of findings must be filed with DES and the water system at the conclusion of each survey. It will be the responsibility of the water system to repair any leaks found.

- Task 1 - Initial Survey

The leak detection firm (firm) will utilize specialized equipment to “listen” for sounds on direct contact points such as main line gate valves, fire hydrants, meter/curb valves, and blow-off’s. The initial survey may be performed on contact points within the system provided that leak sounds travel the entire distance between contact points. If leak sounds may not be heard the entire distance between points as a result of pipe material, pipe diameter, contact point spacing, system pressure, soil type, equipment sensitivity, or any other factor, a ground microphone must be used to listen directly over the pipe at a six to ten foot interval in addition to listening to available contact points. The firm will utilize a test rod and/or resonance plate in conjunction with the ground microphone in instances where the main is located more than three feet off of a hard surface.

- Task 2 - Pinpointing Phase

In areas where leakage is detected, the firm will first confirm the locations of mains and services through the use of maps and/or pipe locators. The firm will then perform an intensified pattern of sonic tests directly over the mains and services to identify the location of the leak. An electronic digital leak noise correlator may be used as a pinpointing tool, but a ground microphone shall be used to confirm the correlator results.

- Task 3 - Leak Report

The firm will prepare illustrated leak locations on diagrammatic reports. Each leak that is identified will be classified according to estimated size and hazard to help facilitate repair by the water system. The firm will meet with the designated representative of the water system on a daily basis and deliver leak reports from the previous day. At the conclusion of the survey, a final report will be prepared and submitted to the Department and copied to the water system. The report will include the original leak reports, a breakdown of the rate of water loss by classification, a breakdown of the loss by source of leakage, and a summary of the project.

#### **IV. Proposal Format**

The proposal should include the following information:

- **Methodology:** The proposals must include a description of the methodology proposed to perform the leak detection survey. The description should include the technology and equipment to be used to detect leaks, determine field location, and description of means to estimate leak volume.
- **Qualifications:** A description of the technical qualifications, training received, and experience of each staff member that will perform the surveys.
- **Cost & Time:** A breakdown of the cost and time required to complete each of the twenty-six projects. All of the projects may not be funded. Projects selected for funding will be determined in part based on the total cost of the proposals received.
- **Previous Work:** Examples of the three most recently completed leak detection surveys for community water systems that have utilized the firm's services including contact information. Please include examples of the daily and final leak report format that would be used in task 3 above.

#### **V. Additional Information**

Multiple contracts may be awarded to complete the surveys if time and/or personnel constraints present a problem such that the work could not be completed by a single firm during the 2015 season.

All firms are responsible for consulting with the individual water systems and/or reviewing DES files to ensure an accurate price is provided in the proposal(s). Many of the twenty-six water systems included a distribution map with their request for funding. The maps are of varying quality but may be viewed by contacting DES (see below).

All water systems receiving assistance are required to work with the selected firm to ensure successful implementation. The firm selected will be responsible for contacting each water system to confirm the availability of water system staff to conduct the necessary work before and during the actual leak detection surveys.

#### **VI. Evaluation Criteria**

A selection committee consisting of DES representatives will be used to evaluate the submitted proposals based on the following criteria:

- Overall understanding of the services to be provided 20%
- Adequacy of approach to identify leaks in diverse situations 20%
- Qualifications and experience of staff 20%
- Cost of projects 20%

- Time to complete

20%

### **VII. Proposal Submittal Date**

Three copies of the firm's proposal should be submitted no later than September 30<sup>th</sup>, 2014 to:

Stacey Herbold  
Drinking Water & Groundwater Bureau  
New Hampshire Department of Environmental Services  
29 Hazen Drive, PO Box 95  
Concord, NH 03302-0095

### **VIII. Questions**

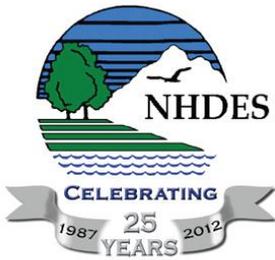
All inquiries related to this request for proposal should be made to Stacey Herbold who may be reached using the address above, by telephone (603) 271-0659, or by email at [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov).

### **IX. Attachments**

Leak project solicitation

General map showing locations of proposed surveys

Project request submittals provided by the community water systems seeking assistance.



The State of New Hampshire  
**Department of Environmental Services**

**Thomas S. Burack, Commissioner**

*Celebrating 25 Years of Protecting  
New Hampshire's Environment*



**Free Leak Detection Surveys for Community Water Systems  
~Project Solicitation~**

The New Hampshire Department of Environmental Services (“DES”) is currently soliciting requests for leak detection surveys from community water systems in New Hampshire. Acoustic leak detection surveys locate leaks using mechanical and electronic listening equipment to detect leakage sounds. Proactive leak detection provides the opportunity to repair leaks early and minimize wasteful water withdrawals, capture lost revenue, and control disruption to the water system.

Project requests will be prioritized on a competitive basis and leak detection surveys awarded to those that demonstrate the greatest potential for water savings and/or provide the most benefit to the water system. The surveys will be funded by DES and completed using a professional leak detection firm.

Project requests must be received by DES no later than **July 11, 2014** in order to be considered. Requests need to be returned to the following address:

NHDES – Drinking Water & Groundwater Bureau  
Water Use & Conservation Program  
29 Hazen Drive, PO Box 95  
Concord, NH 03302-0095

DES will rank and prioritize the project requests and assemble a Request for Proposal (RFP) to allow interested leak detection firms to submit competitive bids for completion of the work. DES will select the firm that will complete the leak detection surveys and anticipates that the work will be conducted during the 2015 field season.

**Eligibility & Requirements**

- The applicant must be an active New Hampshire community water system.
- The water system shall provide the assistance of a Certified Operator, as needed by the leak detection firm, to ensure successful implementation of the survey.
- The water system shall locate and paint all main line valves prior to the leak detection survey.
- The water system shall locate curb stops, as needed by the leak detection firm, to ensure successful implementation of the survey.
- Following receipt of the final report from the leak detection firm, the water system shall prepare a response plan to address all leaks identified during survey.

**Ranking Criteria**

- Potential water savings of project
- Benefit to water system as a result of overall demand reduction
- Demonstration that the water system will repair identified leaks in a timely manner
- Demonstration that the water system will provide the assistance of a certified operator

[www.des.nh.gov](http://www.des.nh.gov)

29 Hazen Drive • PO Box 95 • Concord, NH 03302-0095  
(603) 271-3503 • TDD Access: Relay NH 1-800-735-2964

## **Required Information**

Water System Name: \_\_\_\_\_ PWSID: \_\_\_\_\_

Point of contact for this project: \_\_\_\_\_ Phone: \_\_\_\_\_

Certified Operator that will assist with surveys: \_\_\_\_\_

Total miles of pipe proposed to be surveyed: \_\_\_\_\_ Percent of distribution system: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: \_\_\_\_\_

## **Examples of Supporting Justification (When Available)**

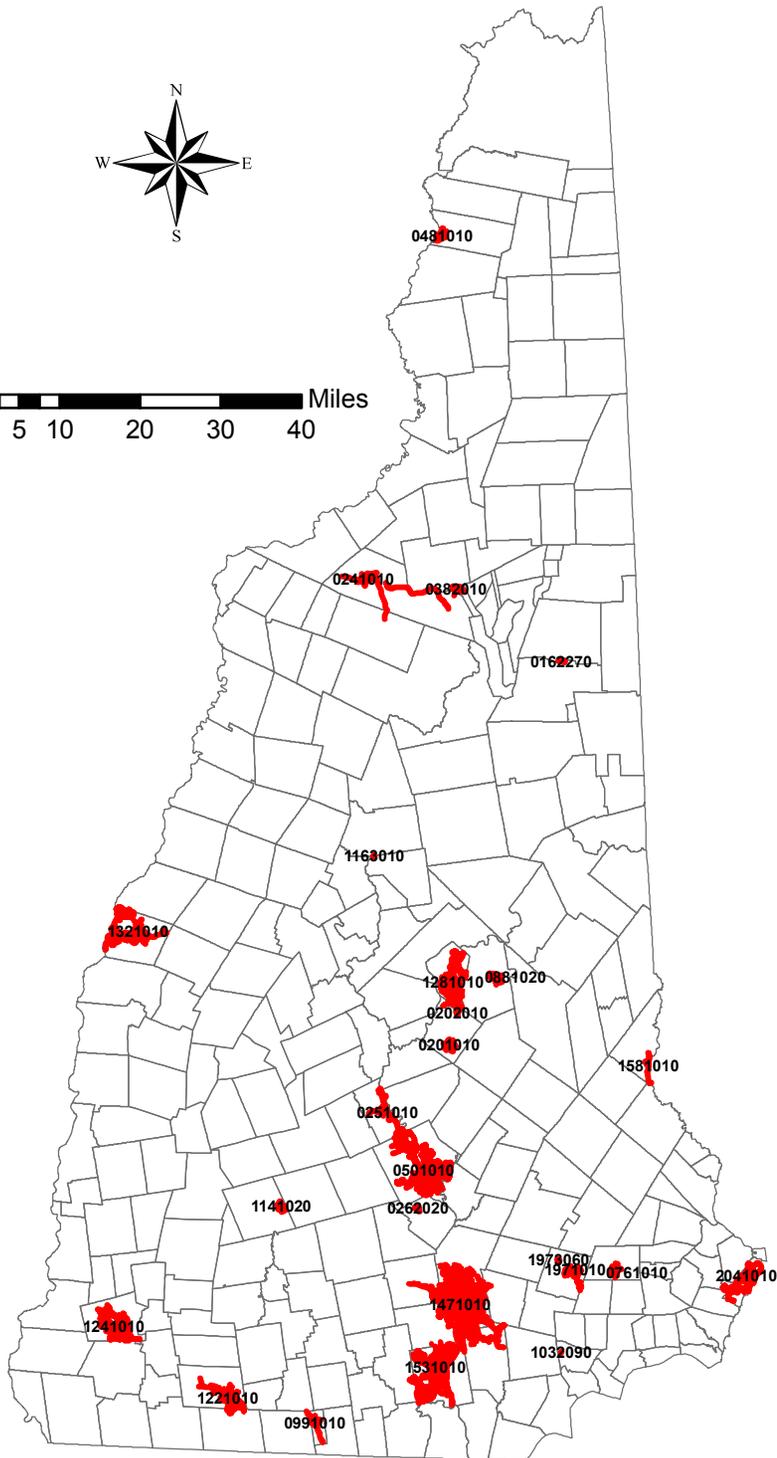
Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

## **Technical Resources**

- AWWA Water Loss Control:  
<http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual “Water Audits & Leak Detection”
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

# New Hampshire Department of Environmental Services Proposed Leak Detection Surveys -Field Season 2015-



PWSID	SYSTEM NAME	TOWN
0162270	NORDIC VILLAGE	BARTLETT
0201010	BELMONT WATER DEPT	BELMONT
0202010	LAKELAND MGT CO	BELMONT
0241010	BETHLEHEM VILLAGE DIST	BETHLEHEM
0251010	PENACOOK BOSCAWEN WATER PRCT	BOSCAWEN
0262020	WHITE ROCK WATER CO	BOW
0382010	ROSEBROOK WATER COMPANY INC	CARROLL
0481010	COLEBROOK WATER WORKS	COLEBROOK
0501010	CITY OF CONCORD	CONCORD
0761010	EPPING WATER AND SEWER DEPT	EPPING
0881020	GUNSTOCK ACRES VILLAGE DIST	GILFORD
0991010	GREENVILLE WATER DEPT	GREENVILLE
1032090	GLENWOOD REALTY	HAMPSTEAD
1141020	EMERALD LAKE	HILLSBOROUGH
1163010	TOWN LINE VILLAGE	HOLDERNESS
1221010	JAFFREY WATER WORKS	JAFFREY
1241010	KEENE WATER DEPT	KEENE
1281010	LACONIA WATER WORKS	LACONIA
1321010	LEBANON WATER DEPT	LEBANON
1471010	MANCHESTER WATER WORKS	MANCHESTER
1531010	MERRIMACK VILLAGE DIST	MERRIMACK
1581010	MILTON WATER DIST	MILTON
1971010	RAYMOND WATER DEPT	RAYMOND
1973060	LEISURE VILLAGE	RAYMOND
2041010	RYE WATER DIST	RYE

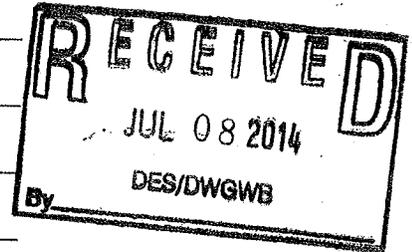
**Drinking Water and Groundwater Bureau  
Water Use & Conservation Program**

Contact: 603-271-0659  
Stacey.Herbold@des.nh.gov



**Required Information**

Water System Name: Belmont Water Dept PWSID: 0201010  
 Point of contact for this project: Jim Fortin Phone: 603-528-2677  
 Certified Operator that will assist with surveys: Don Hurd  
 Total miles of pipe proposed to be surveyed: 4.5 Percent of distribution system: 10  
 Pipe material: Cast IRON Age: 62 Miles: 2.5  
 Pipe material: Ductile Age: 32 Miles: 2  
 Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_  
 Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_



\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 30

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control:  
<http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

**Required Information**

Water System Name: Bethlehem Village District PWSID: 0241010  
Point of contact for this project: Derek Brown Phone: 869-3440 - 616-2320  
Certified Operator that will assist with surveys: Joshuelch Derek Brown  
Total miles of pipe proposed to be surveyed: 12.1 Percent of distribution system: 1/2  
Pipe material: Cast Iron Age: 100 + Miles: 5.7  
Pipe material: Cast Iron Age: 100 + Miles: 3.4  
Pipe material: Cast Iron Age: 60 Miles: 1  
Pipe material: Cast Iron Age: 60 Miles: 2

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: As soon as it can be done

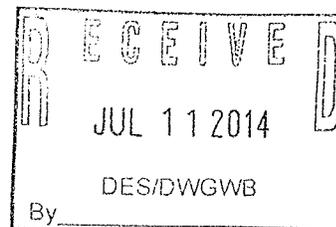
**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

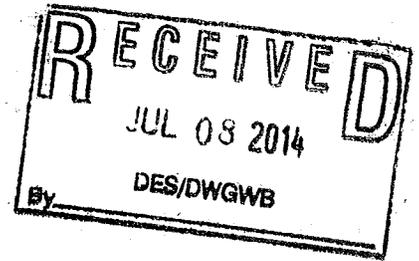
**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



July 7<sup>th</sup>, 2014

Concord General Services  
311 N. State St  
Concord, NH 03301  
603 228-2737



NH Dept. of Environmental Services Free Leak Detection Survey (A)

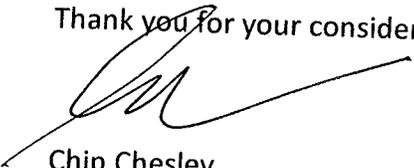
The City of Concord, PWSID #0501010, is requesting to participate in the 2015 Leak Detection Survey Program. With over 200 miles of distribution system piping, we are requesting a system survey of 15%. The 15% will cover the large Downtown area, where older mains and recently cement lined mains exist. Our water conservation technician, Josh Worthen, NH Operator #2952, will be on hand to assist the survey crew with any distribution need.

The area requested will be the entire downtown area, including commercial and residential areas. Boundaries of the survey will be from Penacook Street south to Pleasant St, the Extra-High service area to the west, and the Fort Eddy Commercial zone to the east (see Appendix A). Pipe materials and sizes range from 6" thru 20" cement lined cast iron, and 6" thru 16" cement lined ductile iron, with a break down in Appendix B. The area was chosen based on recent findings where leaks have occurred post construction (services and joints being disrupted by the aggressive cleaning and lining) and the age of cast iron materials. There are also significant high traffic areas that require extra manpower, and flexible time for an accurate survey.

Our recent water audit, using AWWA's M36 software, resulted under the 15% non-revenue water figure, and less than 10% of that being Current Annual Real Losses. While these numbers are acceptable by industry standards, Concord being an innovator in New England, with an established position to monitor this data, needs to use whatever resource(s) available to lower this percentage of non-revenue water.

Based on the initial survey and follow up surveys, all correlations found will be thoroughly investigated (test holes in asphalt, chlorine indicator tests on visible water, pressure tests, etc.) and all real losses will be repaired. Any situation where the previous statement is not possible based on recommendations of City Engineers and Concord General Services will be reported to the NH DES Water Conservation Program.

Thank you for your consideration,

  
Chip Chesley  
Director, Concord General Services

**APPENDIX B**

**CAST IRON MAINS**

<b><u>SIZE OF MAIN</u></b>	<b><u>AGE (yrs.)</u></b>	<b><u>MILES</u></b>
6"	60-100 +	4
8"	60-100 +	7
10"	60-100 +	6
12"	50	1
20"	100 +	3

**SUBTOTAL 21**

**DUCTILE IRON MAINS**

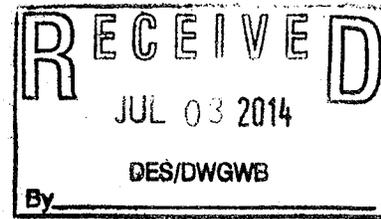
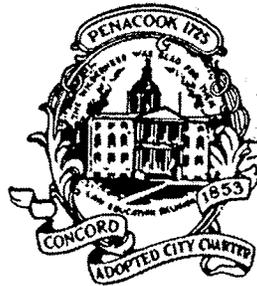
<b><u>SIZE OF MAIN</u></b>	<b><u>AGE (yrs.)</u></b>	<b><u>MILES</u></b>
6"	40	1
8"	8-30	5.5
12"	8-30	1
16"	40	1.5

**SUBTOTAL 9**

**TOTAL PROJECT 30 MILES**

July 7<sup>th</sup>, 2014

Concord General Services  
311 N. State St  
Concord, NH 03301  
603 228-2737



NH Dept. of Environmental Services Free Leak Detection Survey (B)

The City of Concord, PWSID #0501010, is requesting to participate in the 2015 Leak Detection Survey Program. With over 200 miles of distribution system piping, we are requesting a system survey of 15%. The 15% will cover the large South End area, where older mains and recently cement lined mains exist. Our water conservation technician, Josh Worthen, NH Operator #2952, will be on hand to assist the survey crew with any distribution need.

The area requested will be the entire south end area, including commercial and residential areas. Boundaries of the survey will be from Pleasant Street south to Bow town line and the Heights zone to the east (see Appendix A). Pipe materials and sizes range from 6" thru 16" cement lined cast iron, and 4" thru 12" cement lined ductile iron, with a break down in Appendix B. The area was chosen based on recent findings where leaks have occurred post construction (services and joints being disrupted by the aggressive cleaning and lining) and the age of cast iron materials. There are also significant high traffic areas that require extra manpower, and flexible time for an accurate survey.

Our recent water audit, using AWWA's M36 software, resulted under the 15% non-revenue water figure, and less than 10% of that being Current Annual Real Losses. While these numbers are acceptable by industry standards, Concord being an innovator in New England, with an established position to monitor this data, needs to use whatever resource(s) available to lower this percentage of non-revenue water.

Based on the initial survey and follow up surveys, all correlations found will be thoroughly investigated (test holes in asphalt, chlorine indicator tests on visible water, pressure tests, etc.) and all real losses will be repaired. Any situation where the previous statement is not possible based on recommendations of City Engineers and Concord General Services will be reported to the NH DES Water Conservation Program.

Thank you for your consideration,

Chip Chesley  
Director, Concord General Services

APPENDIX B

CAST IRON MAINS

<u>SIZE OF MAIN</u>	<u>AGE (yrs.)</u>	<u>MILES</u>
6"	60-100 +	7.5
8"	60-100 +	2.5
10"	60-100 +	3.5
12"	50	2.5
14"	100 +	1
16"	100 +	1

SUBTOTAL 18

DUCTILE IRON MAINS

<u>SIZE OF MAIN</u>	<u>AGE (yrs.)</u>	<u>MILES</u>
4"	20	.5
6"	8-30	.75
8"	8-30	8.5
12"	8-30	3.5

SUBTOTAL 13.25

TOTAL PROJECT 31.25 MILES



**CITY OF LEBANON**  
**DEPARTMENT OF PUBLIC WORKS**  
193 Dartmouth College Highway  
Lebanon, NH 03766

July 10, 2014

To: Derek Bennett  
NHDES – DWGB  
29 Hazen Drive  
P.O. Box 95  
Concord, NH 03302-0095

The City of Lebanon is interested in applying for the 2015 grant for the Free Leak Detection Survey Program. The City is currently undergoing a leak detection program under the previous grant and would like to continue the program to eliminate any leaks in the rest of the system. The City currently maintains approximately 88 miles of various types and sizes of water lines along with 853 hydrants. The City has an aging system with most lines more than 80 years old. We are continually working on replacing lines as funding allows mostly thru our CSO Projects.

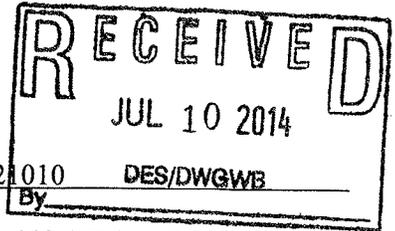
The City has used leak detection equipment in the past with the most recent time being in the spring of 2012 when we were able to locate a leak in West Lebanon that ran for a two week period with a loss of approximately 8.4 million gallons. Thanks to the assistance of Granite State Rural Water we were able to locate the leak on Interchange Drive and made the needed repairs. The City currently produces about 624 million gallons per year and our calculated unaccounted for usage totals approximately 10 % to 12% which translates to over 171,000 gpd of non-revenue water produced. This equates to an annual loss of potential revenues of \$336,857.00.

The City would like to lower non-revenue water usage and is able to provide needed resources together to accomplish that task. We are proposing to evaluate approximately 43 miles of water lines in the City which equals approximately 56% of our system. We would work with the Leak Detection Firm as needed and prepare a response plan based on what leaks are found during the survey. The City will prioritize the areas identified and based on the information received develop a response plan.

Respectfully submitted,

Jim Angers

Water Treatment Plant Superintendent  
City of Lebanon, NH



**Required Information**

Water System Name: City of Lebanon Water Department PWSID: 1321010 By DES/DWGWB

Point of contact for this project: Jim Angers, Superintendent Phone: Office (603) 448-2514, cell 359-7072

Certified Operator that will assist with surveys: Clive Tweed, Foreman, Office (603) 298-5190, cell 727-2705

Total miles of pipe proposed to be surveyed: 43 Percent of distribution system: 56%

Pipe material: < 4" galv. & Cu Age: Unknown Miles: 10

Pipe material: 6" to 8" Iron Age: Unknown Miles: 17

Pipe material: 10" to 12" Iron Age: Unknown Miles: 14

Pipe material: 16" Iron Age: Unknown Miles: 2.3

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 30 to 60 days

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
  - The 2014 Leak detection survey is in progress at the time of submittal of this application.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
  - Estimated as 10-12% of current production.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system.
  - Systematically reducing non-revenue water loss due to leaks, bleeds, etc., over the past five years has assisted in reducing water plant production by approximately 200,000 gallons per day.

### Required Information

Water System Name: Colebrook Water Works PWSID: 0481010

Point of contact for this project: April Hyde Phone: 603 237 8019

Certified Operator that will assist with surveys: April Hyde

Total miles of pipe proposed to be surveyed: 7 1/2 Percent of distribution system: 88

Pipe material: Ductile Iron Age: 2-130 Miles: 6 3/4

Pipe material: Plastic HDPE Age: 3-4 yrs Miles: 3/4

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 8 months depending on time of year

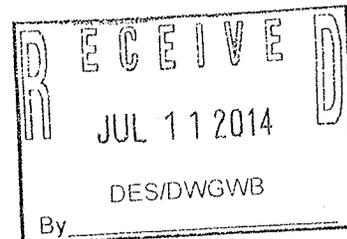
### Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples of system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

### Technical Resources

- AWWA Water Loss Control: <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [derek.bennett@des.nh.gov](mailto:derek.bennett@des.nh.gov) (603-271-6685), [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



**LEAK DETECTION GRANT**

**APPLICATION**

**EMERALD LAKE VILLAGE DISTRICT**

**REQUIRED INFORMATION**

Water System Name: Emerald Lake Village District

PWSID: **1141020**

Point of Contact for this Project: John Dahood, Chairperson, Board of Commissioners  
603-464-2549/603-289-3560  
[smd7411@aol.com](mailto:smd7411@aol.com)

Scott Osgood, District Administrator  
603-464-3128  
[emeraldlakedistrict.dso@gmail.com](mailto:emeraldlakedistrict.dso@gmail.com)

Certified Operator: Joe Damour  
Water System Operators, Inc.  
603-428-3525/603-848-3525  
Henniker, New Hampshire

Total miles of pipe: Total: ap. 14 miles  
New Main Line (Metal) with dataloggers: ap. 2.3 miles  
To be Surveyed: ap. 11.7 miles  
Percentage: ap. 83% (plastic)

Pipe Material: 1-2-4 inch flexible plastic

Age: Ap. 50 years

Project Distribution Map: To Be Provided Separately

Proposed Maximum Number of Days for Repair: 2-5 days

**SUPPORTING JUSTIFICATION**

The attached Leak Log contains the dated reason and quantification of loss of nonrevenue water for all leaks experienced from 2012 to date (WSO). This includes ap 59,000 gallons in 2014. No water audit has been possible because the ELVD does not have meters yet. The system has not experienced a total outage in the last three years; but most of the leaks in excess of 20 GPM have caused low water pressure and isolated temporary outages.

## BACKUP INFORMATION

### I. INTRODUCTION

This application for funding to conduct a leak survey is submitted on behalf of the Emerald Lake Village District ("ELVD"), situated within the Town of Hillsborough. The ELVD has a community well system consisting of 8 bedrock wells, a pumphouse, two treatment centers, and a 180,000 gallon atmospheric holding tank. The water system, including distribution lines and mains, is more than 50 years old. The District is struggling with replacement of aging water infrastructure.

In 2007, the District imposed a moratorium on new connections on advice of DES due to frequent water shortages caused by leakage and pipe breaks, as well as source capacity. Due to significant improvements since that time, on November 12, 2010, DES issued a letter allowing further connections, with development of Patten Hill Well #11 and appropriations for water system upgrade through pipe and main replacement. The letter notes that "A recent leak survey of ELVD piping by Heath Consultants reveals no significant detectable water losses". However, leaks continue throughout the branch roads which do not have upgraded lines.

DES recommended continued development of additional source wells in the event of further building, "continued efforts to complete the water metering project and establishing a rate structure that encourages conservation"; and, completion of the piping replacement project.

The District consists of approximately 550 residences, many of which originated as camps and seasonal vacation homes in this development, which was created in the 1960's when no regulations governed. A fascinating history of this development and its wells is encapsulated in the first Master Plan of 1989 for the ELVD. Appendix A attached includes relevant pages from that plan (pages 1-6, page 24).

In June 1979, the District was formed. In January 1984, by a vote of 14 to 6, the water system was purchased from the developer for the sum of \$225,000 which consisted of \$185,000 for the system, \$30,000 for extra land, and \$10,000 as a reserve for first year operational and maintenance costs. As of the time of the 1989 Master Plan, there were six wells for 340 homes, by which time more wells were added including Well #9 on Patten Hill in 1988. Some wells were abandoned in this process, leaving 8 operating wells currently in the District. (See Appendix B; Map of District Water System)

As of the latest warrant issue for water billing in 2013-2014, a total of 529 residences were on the roster; some residences have their own wells. Currently, water charges are billed at a flat rate of \$630 per annum, as increased by \$100 per annum this past billing cycle to accommodate long term debt incurred to support infrastructure improvements

This defines the current revenue parameters, which must factor in a history of ap. 20%+ delinquency and default rate, to net approximately \$250,000- \$280,000 in gross revenues. As the water charges necessarily escalate, so does the delinquency rate. Although the median income level for Hillsborough is ap \$55,000, it is believed that the average income within the District is substantially lower.

The District contracts with Water System Operators Inc of Henniker, New Hampshire (“WSO”) at a current monthly maintenance cost of \$4,994 per month. WSO also completes leak repairs, handles treatment, replacement of parts, and related functions at additional cost. Annual leak repair is estimated at \$20,000 to \$25,000. Parts and infrastructure replenishment, according to WSO, should cause the District to maintain a capital reserve fund of \$50,000 to \$100,000. This is apart from any capital improvement program.

## II. DEMONSTRATED NEED

### A. Financial Circumstances

In 2013, The District paid off a five year \$80,000 note for construction of a water system pump house in 2008.

In 2006, the District voted to raise \$700,000 for capital improvements to the water system, including construction of a new District water storage tank and a new well (Well #11), with bond financing under the Municipal Finance Act. Repayment on this bond is current with the NH Municipal Bond Bank under a 20 year schedule.

Bond financing was authorized again by the voters for a total of \$2.4 million in 2010, and \$1.8 million was incurred through the DES DWSRF in Phase I for a partial retrofit of the distribution side of the water system.

The total of the annual bond payments for this year will be \$162,803.18.

The balance of \$600,000 in voter authorized bond financing is the subject of the pending DW SRF 2013 Application recently submitted for a further phase of work.

Installation of water meters has been deferred under the District’s current Water Conservation Plan submitted December 2013, and approved with conditions by letter dated February 20, 2014. A pre-application for ap. \$1 million for the following year has been submitted, to fund meter installation.

A question continues to exist whether the residents can continue to support added debt service. It does not currently have the resources to meet the maintenance reserve budget or to fund capital improvements which are necessary, and some of which are required by DES in a November 2012 Sanitary Survey. See Appendix C, attached.

**B. System Failures**

The 2009 Water System Plan was commissioned with the engineering firm of Tata & Howard to develop phased remediation of the aging system.

The first phase consisted of replacing the standard 2 inch plastic distribution lines with 8 inch metal pipes in a complete loop around the lake, along with mains and blowoff valves. Vaults for 4 dataloggers were created, but due to a shortage of funds, dataloggers, or water flow meters, were not installed.

The last general leak survey was performed in 2011. Since the majority of the lines remain plastic, acoustical means are necessary to determine flow.

DES wants the ELVD to conduct another leak survey, as stated in a recent June 23 status meeting on the Water Conservation Plan, and on efforts to continue replacement of infrastructure.

Although the incidence of leaking since completion of Phase 1 in 2013 has decreased substantially, leaks still occur in the branch roads which have not had replacement of lines and mains. See Appendix D, Leak Log 2012-2014 by WSO.

**C. Timeliness**

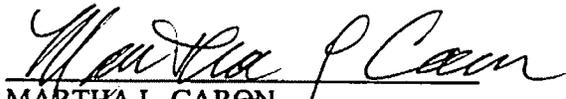
If a leak survey is necessary, it should be conducted before proceeding with any further line and main replacements. The District proposes that the four dataloggers be installed first along the newly replaced primary loop of Phase 1, as represented on the attached map. See Appendix E. Thereafter, a leak survey can be made to determine priority areas for branch line replacement as part of any Phase 2. On the other hand, WSO is very familiar with the leak history and can recommend where available funding should be invested.

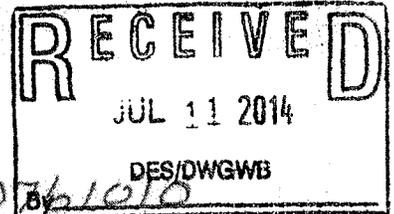
Respectfully Submitted this 10<sup>th</sup> day of July, 2014.

Emerald Lake Village District  
Board of Commissioners (including Water)

  
\_\_\_\_\_  
JOHN DAHOOD, Chair

  
\_\_\_\_\_  
DENISE DEFOREST

  
\_\_\_\_\_  
MARTHA L. CARON



**Required Information**

Water System Name: Epping Water Dept. PWSID: 0761010

Point of contact for this project: DENNIS KOCH Phone: 679-5441 x4

Certified Operator that will assist with surveys: NORM DIONNE

Total miles of pipe proposed to be surveyed: 4.65 Percent of distribution system: 77%

Pipe material: 6" CI Age: 87 Miles: 2.3

Pipe material: 6" DI Age: 85 Miles: .85

Pipe material: 8" CI Age: 80 Miles: .9

Pipe material: 10" CI Age: 87 Miles: .6

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 120

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

**Required Information**

Water System Name: GLENWOOD NORTH PWSID: 1032090

\* Point of contact for this project: Pennichuck, Daniel Wojcik, Jr. Phone: 603-913-2375

Certified Operator that will assist with surveys: BERNARD ROUSSEAU

Total miles of pipe proposed to be surveyed: N/A Percent of distribution system: small water system for 20-unit apartment complex

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 30

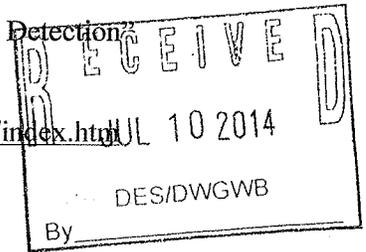
**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.html](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.html)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



\* GLENWOOD NORTH is owned by Minda's Realty, LLC  
(603) 819-4370

Pennichuck is contracted to maintain system.

**Required Information**

Water System Name: Greenville, NH Water PWSID: 0991010

Point of contact for this project: Gerald Curran Phone: 828-1338

Certified Operator that will assist with surveys: Gerald Curran

Total miles of pipe proposed to be surveyed: 5.0 miles Percent of distribution system: 50%

~~Pipe material: Ductile Iron Age: 11 years Miles: 4.9~~

~~Pipe material: Ductile Iron Age: 3 years Miles: 3.0~~

Pipe material: Asbestos Cement Age: >30 years Miles: 4.5

Pipe material: Cast Iron Age: >30 years Miles: 0.5

for Gerald  
7/21/14

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 60 Days

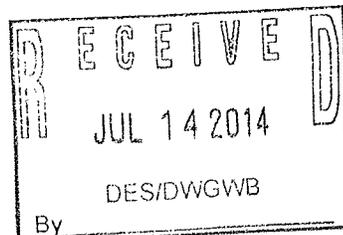
**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



Required Information

Water System Name: Gunstock Acres Village Water District PWSID: 0881020

Point of contact for this project: Alex Crawshaw Phone: (603) 293-8580

Certified Operator that will assist with surveys: Alex Crawshaw

Total miles of pipe proposed to be surveyed: 14 Percent of distribution system: 90%

Pipe material: Cast Iron Age: 50 Miles: 11

Pipe material: PVC Age: 45 Miles: 3

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Distribution map is too large to mail. but is up to date and available as well as curbs. No hydrant  
Proposed maximum number of days for leak repair following discovery: 2

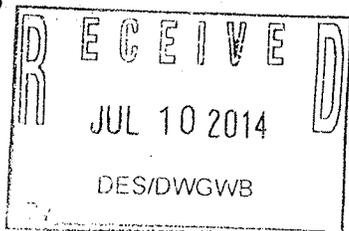
Examples of Supporting Justification (When Available)

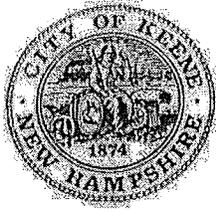
Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- > Results of any recently completed leak detection surveys and/or a report of the findings.  
I provide quarterly reports to DES of leak detection. We repair ~15 breaks per year
- > A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.  
Quarterly reports to DES. We are currently losing 43K Gals / day
- > Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)  
None
- > Any other information demonstrating the potential benefit to the water system

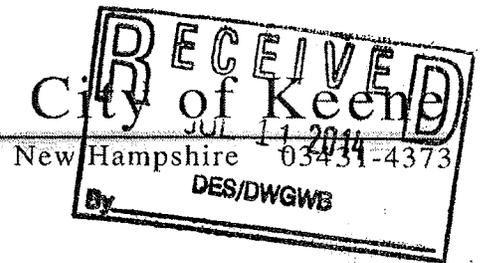
Technical Resources

- > AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- > USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- > American Water Works Association M36 manual "Water Audits & Leak Detection"
- > NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- > NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)





350 Marlboro Street



July 11, 2014

NH Department of Environmental Services  
Drinking Water and Groundwater Bureau  
Water Use and Conservation Program  
29 Hazen Drive  
PO Box 95  
Concord, NH 03302-0095

Re: Leak Detection Survey Application

The City of Keene submits this application for a leak detection survey with the following information.

1. The most recent leak detection survey of the entire system was performed in the summer of 2011. 29 leaks were identified ranging in size from 1 to 40 gpm. The estimated water loss was approximately 354,000 gallons per day, and the larger leaks were repaired immediately upon detection. All leaks were repaired within 90 days of detection.
2. The City's unaccounted for water audit in 2013 shows that the use of approximately 17% of the water produced cannot be identified.
3. The City has approximately 15 miles of water main that are 100 years or older, and an additional 25 miles older than 75 years. Although leaks are repaired when they surface or are otherwise detected, the City's soil conditions are sandy and leaks can go undetected for some time if they drain into the ground or find their way to a sewer or storm drain. The City's relatively high water pressure (90-95 psi in most areas) can result in larger amounts of water loss.

Donna Hanscom  
Assistant Public Works Director

**Area Code 603**

**Phone**

Airport 357-9835 • Assessment 352-2125 • City Attorney 357-9806 • City Clerk 352-0133 • City Manager 357-9804 • Code Enforcement 352-5440 •  
Earm-It 357-9811 • Facilities Maintenance 357-9844 • Fleet Services 352-6550 • Finance 352-1013 • Fire 357-9861 • Health 352-5440 • Human Resources  
357-9858 • Human Services 357-9809 • Information Management Services 357-9802 • Library 352-0157 • Mayor 357-9804 • Parks, Recreation & Facilities  
357-9829 • Planning 352-5474 • Police 357-9815 • Public Works 352-6550 • Purchasing 357-9800 • Recycler Center/Transfer Station 352-5739 • Revenue  
Collection 357-9801 • Water & Sewer 352-6550 • Water & Sewer Billing 352-3239 • Water Treatment Facility 357-8483 • Wastewater Treatment Plant 357-9836 •  
Youth Services 357-9810

**FAX**

Airport 357-9853 • Assessment 357-9857 • City Clerk 357-9884 • City Hall 357-9847 • Fire 358-3420 • Fleet Services 352-4879 • Library 352-1101 • Parks,  
Recreation & Facilities 357-9859 • Police 357-9823 • Public Works 357-9848 • Recycle Center/Transfer Station 357-0106 • Revenue Collection 357-9898 •  
Water Treatment Facility 358-1008 • Wastewater Treatment Plant 357-9854

**Website**

[www.ci.keene.nh.us](http://www.ci.keene.nh.us)

**CITY OF Keene -- WATER MAIN AGE AND MATERIAL**  
 highlighted area is proposed for leak detection

Cast Iron - some is lined but not noted		
	feet	miles
>=100	42907	8.1
75-99	41560	7.9
50-74	20845	3.9
25-49	23300	4.4
<25	375	lined
total		24.4

Cast Iron Universal Pipe		
	feet	miles
>=100	36606	6.9
75-99	89510	17.0
50-74	102026	19.3
25-49	58081	11.0
<25	4863	0.9
total	0	55.1

Ductile Iron Pipe		
	0 Feet	miles
>=100		
75-99	1610	0.3
50-74	1237	0.2
25-49	88377	16.7
<25	128400	24.3
total		41.6

Copper Pipe		
Age	feet	miles
>=100	0	0.0
75-99	31	0.0
50-74	2165	0.4
25-49	256	0.0
<25	0	0.0
total		0.5

Wrought Iron		
Age	feet	miles
57	1073	0.20322

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**Herbold, Stacey P**

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**From:** Nuttelman Seth <Nuttelmans@city.Laconia.NH.US>  
**Sent:** Thursday, July 17, 2014 9:49 AM  
**To:** Herbold, Stacey P  
**Subject:** RE: 2014/2015 Leak Detection Grants!  
**Attachments:** 20142015 Leak Detection Survey Grant Application (2).doc; 2013 LWW Water Loss Report.pdf; Weirs Overview.jpg

Stacey,

Attached please find three documents as submittal for the Leak Detection Survey Grant. The first attachment is the required information on the application. The second is a copy of our 2013 Water Loss Report and the third is a PDF file of our GIS mapping for the area in question. The area that I propose to have the leak detection survey performed is referred by us as our Weirs System and as you can see by the Water Loss Report, our calculated loss for this part of our system is 35%. This is an extremely high percentage for us and it appears that our problems in this area started back in the summer of 2011 according to our power consumptions and pumping records. We have actively been pursuing this problem with some, but I would have to say marginal, success. While we have located and repaired a few leaks, it is obvious that some problems still remain.

The third attachment labeled Weirs Overview is a PDF file of our GIS mapping system for the area in question. At this time, pipe sizes and labeling are not on this particular file because we recently upgraded our system to the "cloud" and in the process lost our labeling. I have contacted our IT people that assure me this is an easy fix and I anticipate having the labeling available shortly. Furthermore, larger scale plans and complete records will be available during the survey work.

Please let me know if this information is sufficient for your needs and I appreciate any assistance you can provide in procuring the necessary funding.

Sincerely,

Seth

Seth Nuttelman  
Superintendent  
Laconia Water Department  
988 Union Avenue  
Laconia, NH 03246  
Phone (603) 524-0901  
Fax (603) 528-5964  
[nuttelmans@city.laconia.nh.us](mailto:nuttelmans@city.laconia.nh.us)

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**From:** Herbold, Stacey P [<mailto:Stacey.Herbold@des.nh.gov>]  
**Sent:** Tuesday, July 15, 2014 10:34 AM  
**To:** Nuttelman Seth  
**Subject:** RE: 2014/2015 Leak Detection Grants!

Hi Seth,

If you can get me the application by the end of the week that will be fine. I also request you keep the application simple. Include the information you did about water losses in the below e-mail, fill out the information on the

**Required Information**

Water System Name: Laconia Water Department PWSID: 1281040

Point of contact for this project: Seth Nuttelman Phone: (603) 524-0901

Certified Operator that will assist with surveys: Drew McKeen, Jason Cornhissen

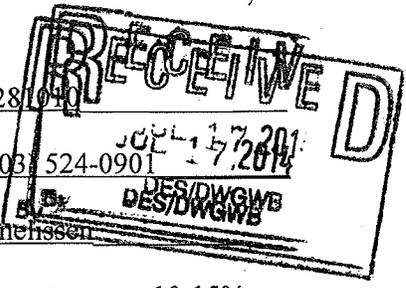
Total miles of pipe proposed to be surveyed: 12 +/- Percent of distribution system: 10-15%

Pipe material: Ductile Iron Age: 40 +/- Miles: 4

Pipe material: Cast Iron Age: 75 +/- Miles: 7

Pipe material: PVC Age: 40 +/- Miles: 1

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_



\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 10

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

**Required Information**

Water System Name: Lakeland PWSID: 0202010

Point of contact for this project: Alex Crawshaw Phone: (603) 293-8580

Certified Operator that will assist with surveys: Alex Crawshaw

Total miles of pipe proposed to be surveyed: 10 Percent of distribution system: 100%

Pipe material: PVC Age: 410 Miles: 10

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: Too large to include but available and up to 2 days

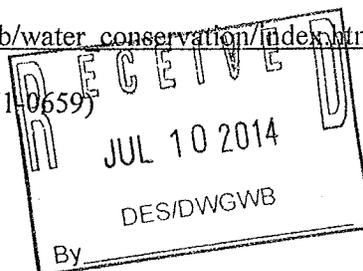
**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

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- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



**Required Information**

System Name: Leisure Village PWSID: 1973060

Point of contact for this project: CHRIS KOFER Phone: 603. 234. 2870

Certified Operator that will assist with surveys:  
- SAME -

Total miles of pipe proposed to be surveyed: \_\_\_\_\_ Percent of distribution system: \_\_\_\_\_

Pipe material: MK 1 1/2" PE Age: 40yrs Miles: 2 ±

Pipe material: 3/4" PE Age: 40yrs Miles: 1 ±

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 7

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

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- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
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- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

### Required Information

Water System Name: Manchester Water Works

PWSID: NH1471010

Point of contact for this project: Guy R. Chabot, P.E.

Phone: 603-624-6494, ext. 2801

Certified Operator that will assist with surveys: Walter Belair

Total miles of pipe proposed to be surveyed: 300

Percent of distribution system: 60%

Pipe material: Cast Iron Pipe

Age: 46-140 years

Miles: 145

Pipe material: Ductile Iron Pipe

Age: 1-46 years

Miles: 145

Pipe material: \_\_\_\_\_

Age: \_\_\_\_\_

Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_

Age: \_\_\_\_\_

Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 3 days

### Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

### Technical Resources

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<http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
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[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



## MANCHESTER WATER WORKS 2013 WATER AUDIT REPORT

<b>Water Supplied by MWW Sources</b>  6,298,214,000	<b>Water Supplied</b>  5,294,682,240	<b>Authorized Consumption</b>  4,909,421,315	<b>Water Exported</b> 1,003,531,760		<b>Revenue Water</b>  5,354,736,142
			<b>Billed Authorized Consumption</b>  4,351,204,382	<b>Billed Metered Consumption</b> 4,349,467,408	
<b>Water Imported</b>  0	<b>Water Losses</b>  118,200,916	<b>Water Losses</b>  118,200,916	<b>Unbilled Authorized Consumption</b>  558,216,933	<b>Billed Unmetered Consumption</b> 1,736,974	<b>Non-Revenue Water</b>  676,417,849
			<b>Apparent Losses</b>  70,698,544	<b>Unbilled Metered Consumption</b> 142,301,764	
			<b>Real Losses</b> 47,502,372	<b>Unbilled Unmetered Consumption</b> 415,915,169	
			<b>Leaks on Mains</b> 36,083,892	<b>Unauthorized Consumption</b> 15,745,535	
			<b>Leaks on Services</b> 11,418,480	<b>Customer Meter Inaccuracies (est.)</b> 54,953,009	
			<b>Systematic Data Handling Errors</b>		

Supporting Justification for NHDES 2015 Leak Detection Survey

Since 2010 (2010, 2013,2014) The Merrimack Village District has requested consideration for the Leak Location Grants that have been offered by NHDES. We have been very grateful for the consideration and acceptance of our request. Again we would like to be considered for the Leak Location Grant.

MVD currently has an internal program utilizing Itron ZCORR, correlating ground microphones. This past year the grant exposed two leaks. We repaired one of the leaks immediately, due to the impending paving crew a mile away, and the fact that the area was wet. The second leak we are using to try and get a better understanding of how to use the correlators. The second leak is not surfacing and we are only getting a 6% chance of a leak from our equipment. We are also trying to hone our ability to distinguish leaks via a ground mic.

We are asking for 40.6 miles to be considered. We have had 131 miles surveyed over the last 3 Leak detection grants offered which is about 54 percent of our system. With the addition of the 40.6 miles being requested to be surveyed we will have completed approximately 77 percent of our system.

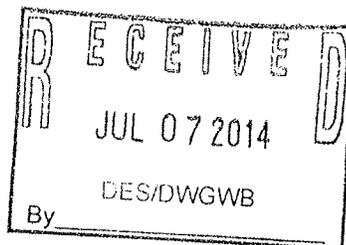
We are still seeing a bit of non-uniform corrosion on the copper services lines that have been installed in the system. Some of the leaks have appeared in the areas we have surveyed and others in areas we have not. Unfortunately the only way we have found these leaks, has been when they have surfaced. How many do we actually have? The survey will help greatly.

Our commitment is that we will supply the assistance of a certified water operator, mark water main valves ahead of the leak locator, locate curbs as needed and upon the receipt of the final report from the leak detection firm prepare a response plan to address all leaks identified.

Regards,

*David Fredrickson*

David Fredrickson  
Distribution Foreman  
Merrimack Village District Water  
2 Greens Pond Road  
Merrimack NH 03054



*PWSID #1531010*

Merrimack Village District

Proposed % of system to be surveyed = 54%

Proposed miles to be surveyed=40 miles

AC	20.45
CI	0.06
DI	8.66
PVC	4.94
Unknown	5.31

**Required Information**

Water System Name: Milton Water District PWSID: 1581010

Point of contact for this project: Steve Elliott Phone: 652-7469

Certified Operator that will assist with surveys: Mark Badger Jr

Total miles of pipe proposed to be surveyed: 7 Percent of distribution system: 100%

Pipe material: Cast Age: 60+ Miles: 5

Pipe material: Ductal Age: 3 Miles: 1/2

Pipe material: transit Age: 50 Miles: 1 1/2

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 3

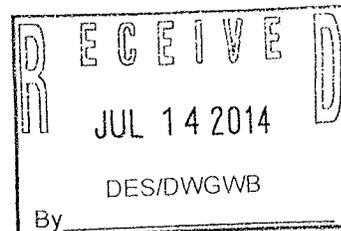
**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
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- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



RAW 6/25/14

Required Information

Water System Name: Nordic Village PWSID: 0162270

Point of contact for this project: Francis X. Lyons Phone: 356-6767

Certified Operator that will assist with surveys: Francis Lyons

Total miles of pipe proposed to be surveyed: 1 mile Percent of distribution system: 100%

Pipe material: PVC Age: 35 Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 30 days

Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

Technical Resources

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- NHDES Water Conservation Program: [http://des.nh.gov/organization/divisions/water/dweb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dweb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

**Required Information**

Water System Name: Penacook - Boscawen Water Precinct PWSID: 0251010

Point of contact for this project: Peter Minen Phone: 545-5681

Certified Operator that will assist with surveys: Randy Silver

Total miles of pipe proposed to be surveyed: 20 Percent of distribution system: 50%

Pipe material: AC Age: 40 Miles: 13

Pipe material: CAST Iron Age: 60 Miles: 5

Pipe material: AC Age: 35 Miles: 2

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 120

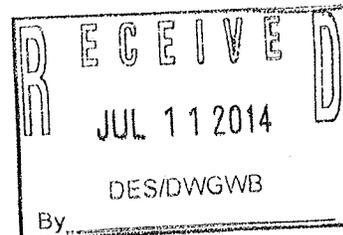
**Examples of Supporting Justification (When Available)**

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- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

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- NHDES Staff: [stacey.herbald@des.nh.gov](mailto:stacey.herbald@des.nh.gov) (603-271-0659)



### Required Information

Water System Name: Raymond Water Dept PWSID: 1971010

Point of contact for this project: Scott Kelly Phone: 603-895-4657

Certified Operator that will assist with surveys: Scott Kelly or Chris Eaton

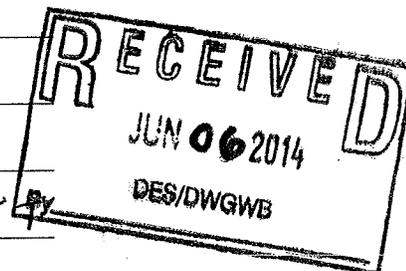
Total miles of pipe proposed to be surveyed: 15 Percent of distribution system: 100%

Pipe material: Ductile Iron Age: 43 Miles: 6.5

Pipe material: Plastic-C-900 Age: 20 Miles: 2

Pipe material: Cast Iron Age: 60+ Miles: 6.5

Pipe material: Alc pipe Age: 53+ Miles: 1000 FT



\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 30

### Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
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- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

**Required Information**

Water System Name: Rosebrook Water Company PWSID: 0382010

Point of contact for this project: Nancy Oleson Phone: 278-4491

Certified Operator that will assist with surveys: Nancy Oleson, Brian Sullivan

Total miles of pipe proposed to be surveyed: 13 Percent of distribution system: 100

Pipe material: Galvanized Age: 20+ years Miles: 3

Pipe material: Copper Age: 20+ Miles: 2

Pipe material: Ductile Age: 20+ Miles: 6

Pipe material: Blue Brute Age: 20+ Miles: 1 Unknown 1 mile

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc. Available at office.

Proposed maximum number of days for leak repair following discovery: 730

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

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- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)



### Rosebrook Water Loss

2008	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	10,520,700	17,327,000	6,806,300	39%	3,315,000	20%
2	6,294,950	10,806,000	4,511,050	42%	65,000	41%
3	9,036,000	14,254,000	5,218,000	37%	108,000	36%
4	11,001,580	16,130,000	4,128,420	27%	407,500	25%
<b>Total</b>	<b>38,853,230</b>	<b>57,517,000</b>	<b>20,683,770</b>	<b>36%</b>	<b>3,893,500</b>	<b>29%</b>

2009	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	9,402,600	16,354,000	6,951,400	39%	1,045	39%
2	6,096,750	10,792,000	4,695,250	44%	5,760	43%
3	9,886,085	13,937,000	4,051,935	29%	2,250	29%
4	8,830,892	14,593,000	5,762,108	39%	1,863,100	27%
<b>Total</b>	<b>34,216,307</b>	<b>54,676,000</b>	<b>20,460,693</b>	<b>37%</b>	<b>1,872,155</b>	<b>34%</b>

2010	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	9,418,602	15,020,000	5,601,398	37%	315,000	35%
2	5,381,470	11,498,000	6,116,530	59%	827,200	46%
3	9,031,150	11,314,100	2,282,950	20%	120,000	19%
4	9,282,040	11,346,700	2,064,660	18%	1,023,000	9%
<b>Total</b>	<b>33,093,262</b>	<b>49,178,800</b>	<b>16,085,538</b>	<b>33%</b>	<b>2,285,200</b>	<b>28%</b>

2011	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	11,240,128	12,729,400	1,489,272	11.7%	324,600	9.1%
2	6,661,638	8,585,300	1,903,664	22.2%	32,050	21.9%
3	10,768,365	12,088,000	1,319,635	11%	-	11%
4	9,163,880	11,773,100	2,609,240	22%	412	22%
<b>Total</b>	<b>37,831,989</b>	<b>45,153,800</b>	<b>7,321,811</b>	<b>16%</b>	<b>357,062</b>	<b>15%</b>

Several inaccessible units were overestimated in 1st qtr and were corrected in 2nd quarter.

2012	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	10,611,098	12,000,900	1,389,804	11.6%	2,800	11.6%
2	6,776,280	7,737,800	961,520	12.4%	38,650	11.9%
3	9,806,570	11,938,900	2,132,330	18%	128,000	17%
4	9,339,095	10,061,900	722,805	7%	24,800	7%
<b>Total</b>	<b>36,533,041</b>	<b>41,739,500</b>	<b>5,206,459</b>	<b>12%</b>	<b>184,250</b>	<b>12%</b>

2013	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	9,438,721	12,026,100	2,587,379	22%	94,000	21%
2	6,745,300	7,725,300	980,000	13%	175,000	10%
3	9,224,850	10,629,500	1,404,650	13%	381,200	10%
4	10,257,040	11,258,000	1,000,960	9%	21,000	9%
<b>Total</b>	<b>35,665,911</b>	<b>41,638,900</b>	<b>5,972,989</b>	<b>14%</b>	<b>621,200</b>	<b>13%</b>

2014	Consumption	Production	Difference	% age unaccounted for	Unbillable known lost water	% age including unbillable known lost water gals
Qtr 1	9,923,253	12,195,900	2,272,647	19%	90,000	18%
2	5,681,941	7,271,100	1,589,159	22%	160,101	20%
3				#DIV/0!		#DIV/0!
4				#DIV/0!		#DIV/0!
<b>Total</b>			<b>3,861,806</b>	<b>#DIV/0!</b>		<b>#DIV/0!</b>

### Required Information

Water System Name: Rye Water District PWSID: 2041010

Point of contact for this project: Ken Aspen Phone: 436-2596

Certified Operator that will assist with surveys: Arik Jones or Darren Prince

Total miles of pipe proposed to be surveyed: Aprox 38-40 Percent of distribution system: 100 %

Pipe material: Cast Iron Age: Aprox 65-70 Miles: Aprox 20-25

Pipe material: Ductile Iron Age: Aprox 35 Miles: Aprox 10-15

Pipe material: AC Age: Aprox 50 Miles: Aprox 0.2

Pipe material: Copper Age: Aprox 30 Miles: Aprox 0.5

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: A.S.A.P.

### Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings:
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

### Technical Resources

- AWWA Water Loss Control:  
<http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

Following receipt of the final report from the leak detection firm, the water system shall prepare a response plan to address all leaks identified during survey.

**Ranking Criteria**

- Potential water savings of project
- Benefit to water system as a result of overall demand reduction
- Demonstration that the water system will repair identified leaks in a timely manner
- Demonstration that the water system will provide the assistance of a certified operator

**Required Information**

Water System Name: TOWN LINE VILLAGE PWSID: 116 3010  
 Point of contact for this project: BARRY CHAMBER Phone: 536-9712  
 Certified Operator that will assist with surveys: INTEGRATED WATER SYSTEMS / (603) 253-6830  
 Total miles of pipe proposed to be surveyed: Approx. 1 1/2 Percent of distribution system: 100% RAY SEELEY  
 Pipe material: PLASTIC / GALV Age: 45-50 yrs Miles: Approx. 1 1/2  
 Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_  
 Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_  
 Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

85 UNITS  
SERVICED

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 1 - 2 days

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

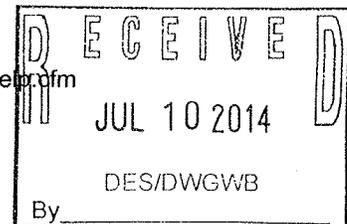
- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>

USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)

American Water Works Association M36 manual "Water Audits & Leak Detection"



### Required Information

Water System Name: Town of Jaffrey

PWSID: 1221010

Point of contact for this project: Randall Heglin/Doug Starr

Phone: 603-532-6521

Certified Operator that will assist with surveys: Tom Lambert/Andy Baranowski

Total miles of pipe proposed to be surveyed: 41.3 miles      Percent of distribution system: 100 %

Pipe material: Cast Iron      Age: 50 to over 100 years      Miles: 20.2

Pipe material: Ductile Iron      Age: under 50 years      Miles: 16.9

Pipe material: HDPE      Age: under 25 years      Miles: 2.13

Pipe material: PVC      Age: under 25 years      Miles: 0.56

Pipe material: Other      Age: 25 – 75 years      Miles: 0.33

Pipe material: Unknown      Age: 25 – 75 years      Miles: 1.24

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

Proposed maximum number of days for leak repair following discovery: 90 days

### Examples of Supporting Justification (When Available)

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.
- Recent examples system shortages cause by leaks (i.e. bulk water, low pressure, etc.)
- Any other information demonstrating the potential benefit to the water system

### Technical Resources

- AWWA Water Loss Control:  
<http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)

**Required Information**

Water System Name: White Rock Water PWSID: 0262020

Point of contact for this project: Alex Crawshaw Phone: (603) 293-8580

Certified Operator that will assist with surveys: Alex Crawshaw

Total miles of pipe proposed to be surveyed: 5 Percent of distribution system: 100%

Pipe material: PVC Age: 40 Miles: 5

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

Pipe material: \_\_\_\_\_ Age: \_\_\_\_\_ Miles: \_\_\_\_\_

\*Please provide a distribution map of the project area that includes the information above and labels any major contact points such as meters, valves, hydrants, PRVs, blowoffs, etc.

available but very old.  
Proposed maximum number of days for leak repair following discovery: 2

**Examples of Supporting Justification (When Available)**

Although the following information is not required, providing justification demonstrating the potential benefit of the project will increase the likelihood of your system being awarded a leak detection survey.

- Results of any recently completed leak detection surveys and/or a report of the findings.  
We do surveys as often as possible.
- A recent water audit and/or estimate of non-revenue water that quantifies potential system losses.  
Unaccounted for water is ~30%
- Recent examples system shortages cause by leaks (.i.e. bulk water, low pressure, etc.)  
bulk water needed in 2012
- Any other information demonstrating the potential benefit to the water system

**Technical Resources**

- AWWA Water Loss Control: <http://www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=47846&navItemNumber=48155>
- USEPA Loss Control: [http://water.epa.gov/type/drink/pws/smallsystems/technical\\_help.cfm](http://water.epa.gov/type/drink/pws/smallsystems/technical_help.cfm)
- American Water Works Association M36 manual "Water Audits & Leak Detection"
- NHDES Water Conservation Program:  
[http://des.nh.gov/organization/divisions/water/dwgb/water\\_conservation/index.htm](http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm)
- NHDES Staff: [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov) (603-271-0659)

