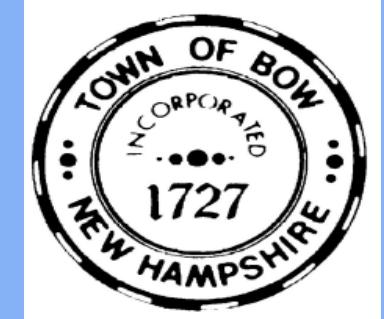


Private Wells

Know Your Water

BOW DRINKING WATER PROTECTION COMMITTEE

JULY 15, 2020



**DARTMOUTH TOXIC METALS
SUPERFUND RESEARCH PROGRAM**

OVERVIEW

- ❖ Private Wells in New Hampshire and Bow
- ❖ Common Contaminants
- ❖ Testing
- ❖ Treatment
- ❖ Questions

1 - The Rundown on Private Wells

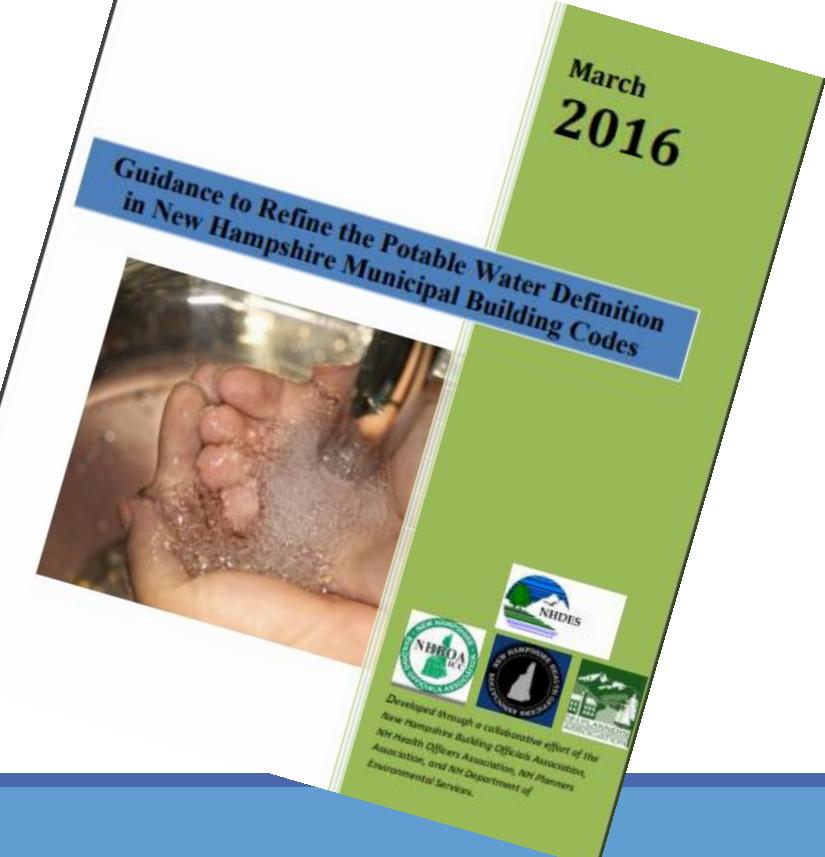
- Private wells serve half (**46%**) of New Hampshire's population and about **90%** of Bow residents.
- There are no uniform testing or treatment requirements for private wells.
- Federal and state drinking water standards are not enforced for private wells.



Municipalities can Require Private Well Testing

Bow, Derry, Pelham, Salem, Windham, Chester

- Adopt 2016 guidance of “potable”
- Testing for Cert. of Occupancy
- Cite RSA 147:1 Public Health Authority
- Reference DES’ Standard Analysis + Radon
- Require testing pre and post treatment



2 - Contaminants

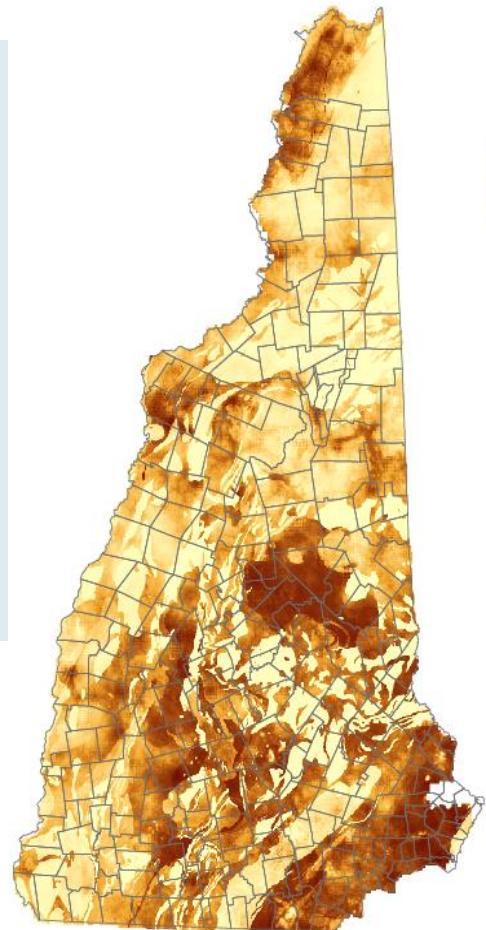


Contaminants
can be both
naturally occurring
and/or
human caused

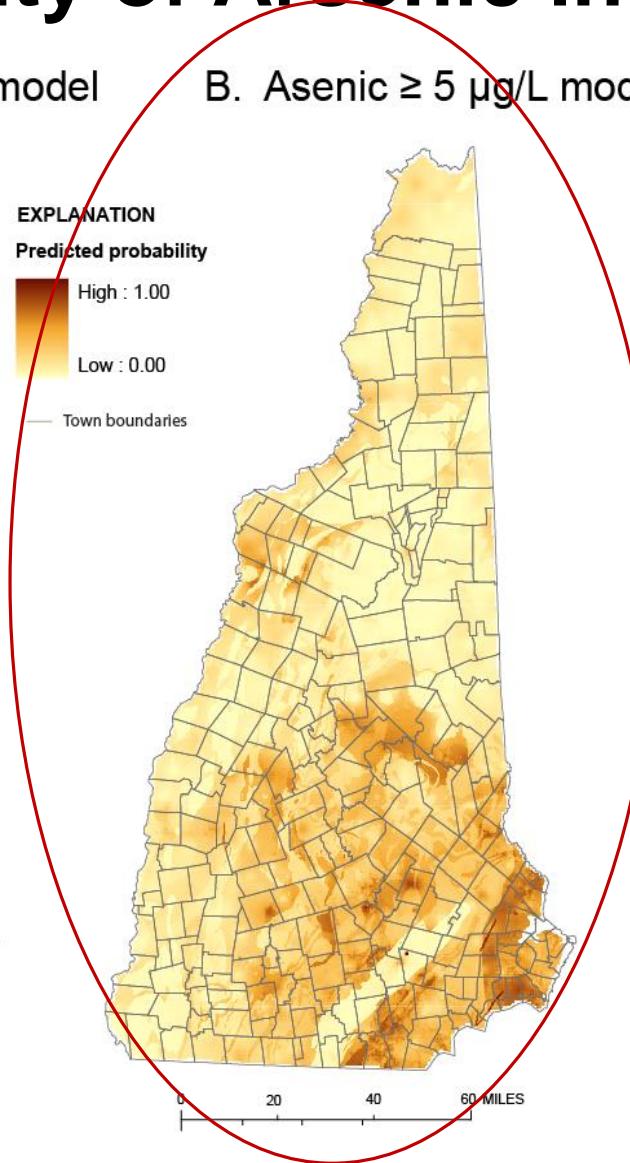
Probability of Arsenic in New Hampshire

Arsenic is an example of a naturally occurring contaminant

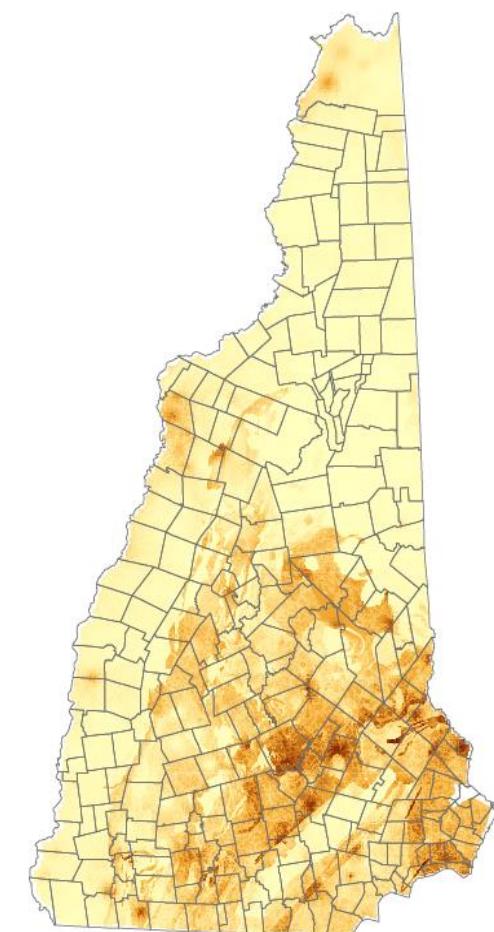
A. Arsenic $\geq 1 \mu\text{g/L}$ model



B. Arsenic $\geq 5 \mu\text{g/L}$ model



C. Arsenic $\geq 10 \mu\text{g/L}$ model



Health Impacts - Arsenic

Low dose, chronic, long term exposure to Arsenic in drinking water can lead to:

- Reproductive and developmental effects (mom/fetus)
- Cancers (bladder, skin, kidney, liver, prostate and lung)
- Vascular and cardiovascular disease
- Cognitive and neurological effects
- Diabetes and other metabolic disorders
- Neuropathy

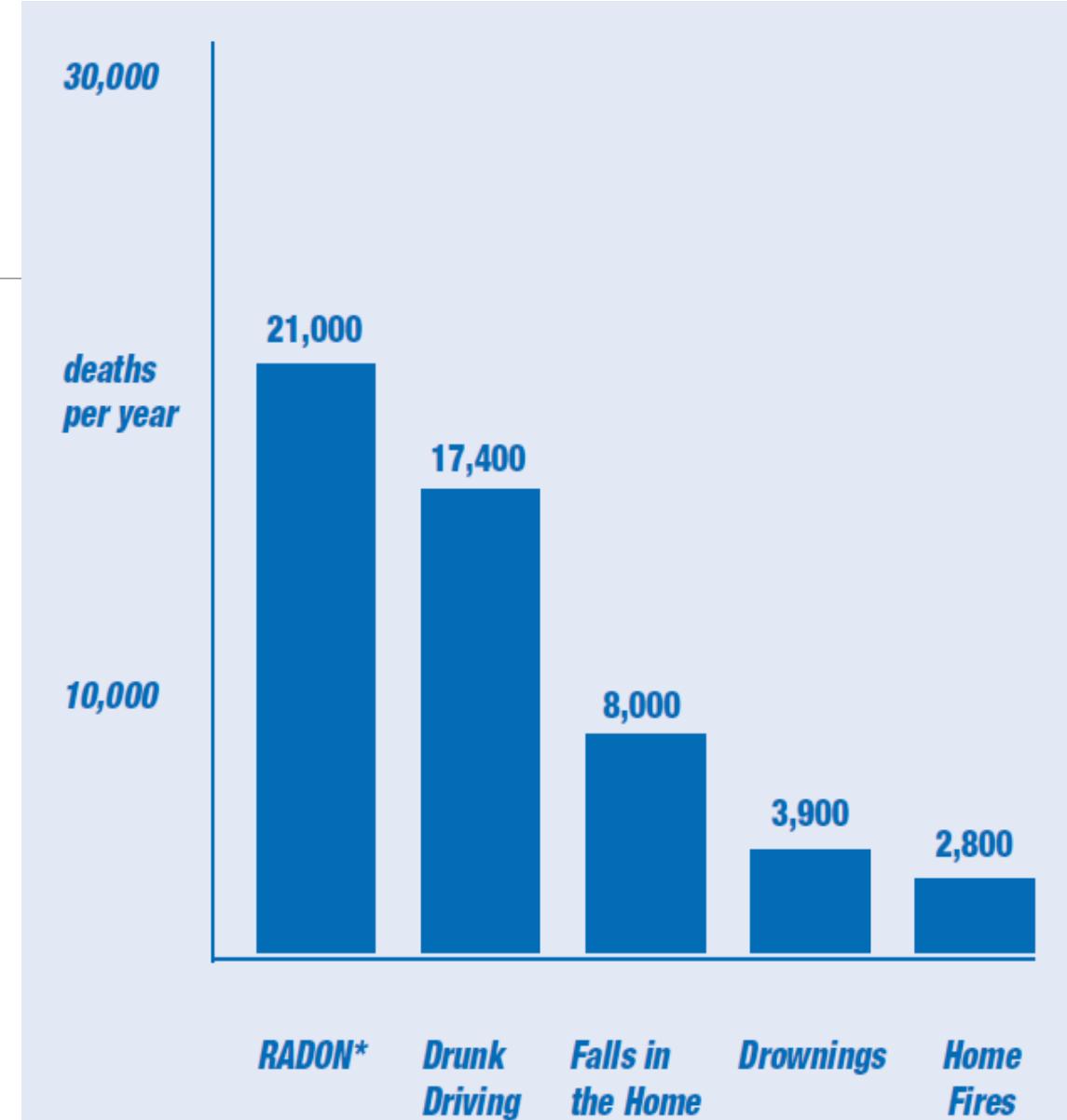
Hughes et al. (2011). "Arsenic Exposure and Toxicology: A Historical Perspective" *Toxicological Sci* 123(2): 305–332.

Health Impacts – Radon

Radon (air)

- 21,000 lung cancer deaths/yr in US
- 100 deaths/yr in NH

*Most of the risk from radon in water comes from breathing radon gas that is released into the air when water is used in the home.



Lead – No Safe Level

HEALTH EFFECTS

Slowed body growth, lower IQ, reduced attention span, aggressiveness and behavior issues, premature birth, lower birth weight, delayed mental and physical development.

REDUCING EXPOSURE

- Flush your tap ***every morning*** before using water for consumption
- Use **alternate water for infants** and children if levels are 5 ppb or higher.
- Install a new **LOW-LEAD** faucet.

LEAD POISONING

HEALTHY HOMES & LEAD POISONING PREVENTION PROGRAM

LEAD IN DRINKING WATER

SOURCES OF LEAD IN WATER

Lead is rarely found in water *before* it enters your home, but the plumbing in your home could be contributing lead to the water you drink. Lead is most likely to be found in your water first thing in the morning after the water sits in the pipes all night, or any length of time where it sits more than six hours.

TEST YOUR WATER

You can not see, smell, or taste lead in water

The only way to know you have lead in your water is to have it tested. To find out about testing, contact the NH State Lab at (603)-271-3445 or contact any certified private lab.

When you take your water sample

- Choose a tap you use for drinking water, such as the kitchen faucet.
- Fill the sample bottle first thing in the morning.

Non-Detect (ND) or Less

- No action needed

1 to 5 ppb (ug/L) or .001 to .005 ppm (mg/L)

- Flush the tap every morning by running cold water for one minute before using. This clears out water that has been sitting in the pipes overnight. Also flush the tap when you have been away from home.
- Use only cold water for drinking and cooking. If you need hot water, start with cold water from the tap and then heat it on the stove or microwave.
- Use bottled water for baby formula and food. If you must use tap water, make sure you only use cold water and flush the tap for a full minute first.

5 to 15 ppb (ug/L) or .005 to .015 ppm (mg/L)

Take steps listed above, AND

- Install a water filter that is certified to remove lead. There are pitcher and faucet filters that remove lead, but read the package carefully. It must say it is certified by NSF/ANSI under Standard 53 for lead removal.
- Test water for lead after you have taken all the steps above to see how effective these steps were in removing lead.

3 - Testing



What to Test

NH DES Standard Analysis

Test Every 3-5 Years

14 in the “Standard Analysis” package
including Uranium

Additional Tests for Private Wells

Volatile Organic Chemical including MTBE

Semivolatile Organics

Radiologicals – Radon, Gross Alpha

NHDES recommends having the following tests done every 3 to 5 years, except for bacteria and nitrate, which are recommended annually.

Standard Analysis

Arsenic	Lead
Bacteria	Manganese
Chloride	Nitrate/Nitrite
Copper	pH
Fluoride	Sodium
Hardness	Uranium*
Iron	

Radiological Analysis

Analytical Gross Alpha
Radon
Uranium*

Volatile Organic Compounds (VOCs)

*Please note: Uranium is part of both the standard and radiological analysis for the State of NH Lab.

Where to test

Accredited Testing Laboratories

Monday, Aug 12, 2013

OneStop - Home Owner Container Request

Submit Reset

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____

First Test: Standard Analysis

Second Test: Optional

Third Test: Optional

Kite Testing Guide

Suggested Water Quality Testing Fact Sheet

DES Lab Current

Fill in the information for ALL items in RED. If any test is "OTHER", please provide an explanation. When completed, click the SUBMIT button. To clear the form, click the RESET button.

of Kites: Max. 10
of Kites: Max. 10
of Kites: Max. 10

Other: (Please explain)

Other: (Please explain)

Other: (Please explain)

New Hampshire Department of Environmental Services | PO Box 95 | 29 Hazen Drive | Concord, NH 03302-0095
603.271.3505 | TDD Access: Relay NH 1.800.753.2594 | Hours: M-F, 8am-4pm

copy

NH.gov | privacy policy | accessibility policy

The Department of Environmental Services is dedicated to making environmental information more readily available to more people while maintaining our confidence in the information. This information is the best available according to the procedures and standards of use of the contributing programs are regularly updating the information in the databases, and the system is periodically being modified to respond to user needs. As a result, the system may not always provide access to all existing information, and it may occasionally contain unintentional inaccuracies. The Department of Environmental Services is not responsible for the misuse or misinterpretation of the information presented by this system.

10:44 AM
8/17/2013

Table 1
Accredited Labs Providing Well Water Quality Testing Services
in New Hampshire and Neighboring States¹

New Hampshire and Neighboring States ¹					
Laboratory Name	Telephone	Address	Town	State	Website
ABSOLUTE RESOURCE ASSOCIATES LLC	(603) 436-2001	124 HERITAGE AVE	PORTSMOUTH	NH	WWW.ABSOLUTERESOURCEASSOCIATES.COM
AQUARIAN ANALYTICAL INC	(603) 783-9097	153 WEST RD	CANTERBURY	NH	WWW.AQUARIANLABS.COM
CHEM SERVE INC	(603) 673-5440	317 ELM ST	MILFORD	NH	WWW.CHEMSERVELAB.COM
ENDYNE INC	(603) 678-4891	56 ETNA ROAD	LEBANON	NH	WWW.ENDYNELABS.COM
ENDYNE INC	(802) 879-4333	160 JAMES BROWN DR	WILLISTON	VT	WWW.ENDYNELABS.COM
GRANITE STATE ANALYTICAL SERVICES LLC	(603) 432-3044	22 MANCHESTER RD, UNIT 2	DERRY	NH	WWW.GRANITESTATEANALYTICAL.COM
NELSON ANALYTICAL LLC	(603) 622-0200	490 E INDUSTRIAL PARK DRIVE	MANCHESTER	NH	WWW.NELSONANALYTICAL.COM
NEW ENGLAND RADON LTD	(603) 893-4260	11 A INDUSTRIAL WAY UNIT 3	SALEM	NH	WWW.NEWENGLANDRADON.COM
NH DHHS PUBLIC HEALTH LABORATORIES	(603) 271-3445	29 HAZEN DR	CONCORD	NH	http://des.nh.gov/organization/commissioner/lslu/index.htm
SEACOAST ANALYTICAL SERVICES	(603) 868-1457	72 PINKHAM RD	LEE	NH	SEACOASTANALYTICAL.COM
NELSON ANALYTICAL LLC	(207) 467-3478	120 YORK STREET	KENNEBUNK	ME	WWW.NELSONANALYTICAL.COM
EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL	(717) 656-2300	2425 NEW HOLLAND PIKE	LANCASTER	PA	WWW.LANCASTERLABSENV.COM
NATIONAL TESTING LABORATORIES	(800) 458-3330	556 SOUTH MANSFIELD ST	YPSILANTI	MI	WWW.NTLABS.COM

Private Wells With Contaminants Above Limit or Advisory

PARAMETER		Percent Exceeding Standard or Advisory	
	Standard	STATEWIDE (2016)	BOW (2015-2018)
Arsenic	10 / 5 ppb	20%	42 / 57%
Bacteria	Absent	19%	21%
Lead (stagnant)	15 ppb	15%	8%
Lead (flushed)	5 ppb	2%	3%
Radon	4,000 / 10,000 pCi/L	24%	27% / 18%
Uranium	30 ppb	~10%	6%
Manganese	0.05 mg/L	40%	24%

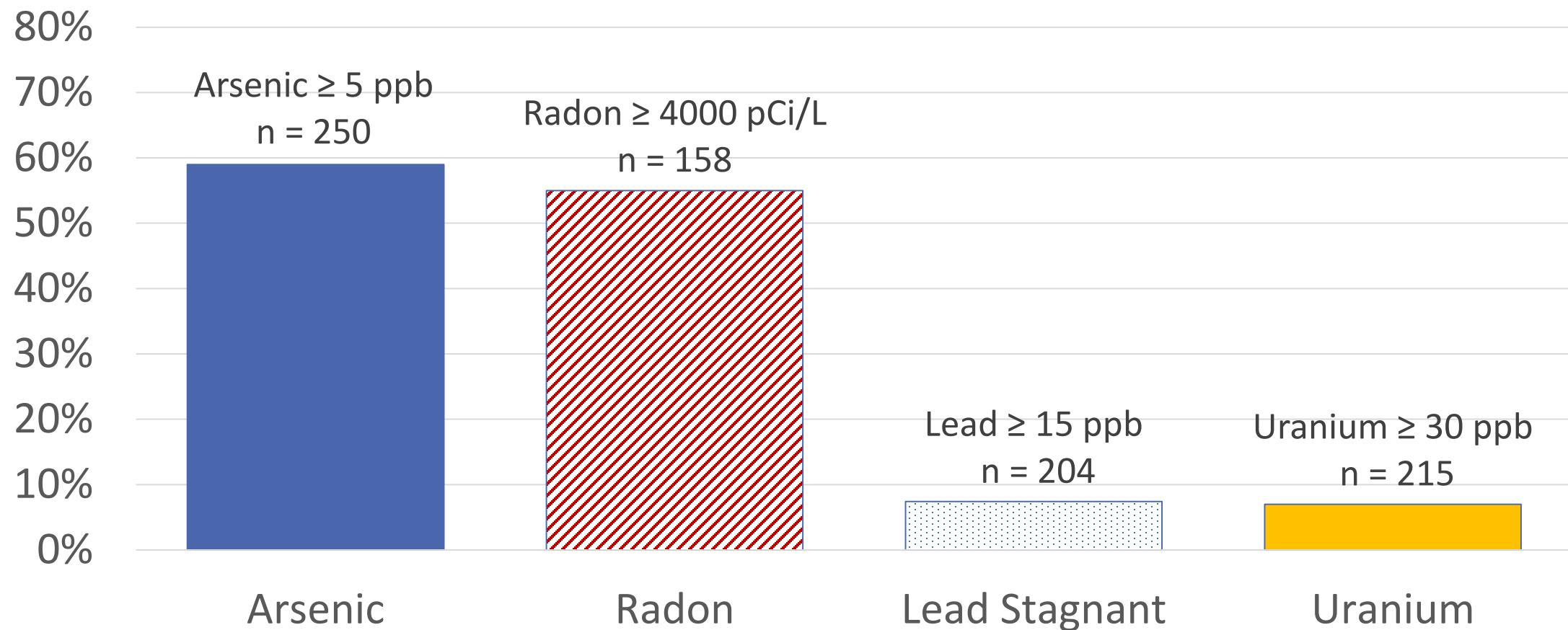
Bow Private Well Data 2015-2019

Parameter	units	Standard	Average	Median	Maximum	Count	% Above
Arsenic	ppb	5	18.1	7.6	176	250	59 %
Lead Stagnant	ppb	15	10.4	1.3	482	204	7 %
LeadFlushed	ppb	5*	1.4	<1	171	211	3 %
Manganese	ppm	0.05	0.12	<0.01	3.3	215	26 %
Radon	pCi/L	4,000*	11,080	5,235	99,275	158	55 %
		10,000*	--	--	--	--	32 %
Uranium	ppb	30	8	2	210	215	7 %

* Recommended guideline

Bow Private Well Testing, 2015-2019

State of New Hampshire Laboratory, Jan 2015 to July 2019



4 - Treatment



Dartmouth's Private Well Survey (2014) revealed that **1 IN 4** people did not understand their lab report, and **1 IN 3** did not know what actions to take.



Point of Use (POU) Water Treatment

Treats water at a single tap:



Contaminants treated at Point of Use include:

- Arsenic
- Uranium
- Gross Alpha
- Taste
- PFAS

Whole-House Water Treatment

Treats all the water
entering the house



Whole House treatment is used for:

- Radon
- Staining - Iron, Manganese
- Corrosivity – Lead, Copper
- Odor - Sulfide
- Scaling- Hardness

NHDES Fields Many Private Well Treatment
Questions by Phone and Email

Be Well Informed Web Tool

- Interprets your lab results
- Compares to water quality standards
- Recommends treatment steps for multiple contaminants
- Lists health effects

Draft - Testing Version

PUBLIC GOVERNMENT BUSINESS A to Z LIST

NH DES's Be Well Informed Guide

PROTECT YOUR FAMILY'S HEALTH AND HOME

INFORMATION AND GUIDANCE FOR
TREATING YOUR WELL WATER



The Be Well Informed Guide from NH DES is designed to help you understand your water test results and, if your well water has commonly found pollutants in it, provide information about health concerns and water treatment choices. New Hampshire is fortunate to have an abundance of clean groundwater, and nearly half of New Hampshire's residents (over 500,000 people) rely solely upon domestic wells (also called "private wells") as their primary source of drinking water. While many private wells provide safe drinking water, certain pollutants like arsenic, iron and manganese are sometimes present in groundwater at levels that can affect your health and home.

NH DES recommends private well owners test their well water every three to five years for pollutants commonly found in New Hampshire's groundwater. This group of commonly found pollutants is listed in NH DES's Private Well Brochure and is referred to as the "Standard Analysis." The Be Well Informed Guide evaluates the pollutants that are part of the Standard Analysis. NH DES recommends that you have your water tested at a [NHELAP accredited laboratory](#). When you have your water tested, your test results will be summarized in the form of a [lab report](#).

With your water test results in hand, click the button below to enter your test results from your laboratory report. You will receive an evaluation of your well water quality and, if necessary, water treatment options.

Read This Disclaimer Before Proceeding

Information provided on this website is for informational purposes only and should not be substituted for direct consultation with a qualified water treatment professional. Other conditions or factors related to your well or home not considered by this online guide may determine the most appropriate water treatment option.

Enter Your Well Water Test Results

DES Private Well Brochure

Accredited Labs in NH

NH DES Private Well Testing Program

Questions or Comments

(603) 271-2513

dwgbinfo@des.nh.gov

Enter your lab
test results on
Be Well Informed

Parameter list is
the Standard
Analysis + Rads

Be sure to select
the correct units

**Please Read
Before You Continue**

- Your lab report may show that a certain pollutant was "Not Detected" in your water. This may be indicated in your report by a "ND" (Not Detected), "BD" (Below Detection), "BDL" (Below Detection Limit) or a less than symbol ("<") next to the result. In these cases, enter a "0" for that parameter.
- If your lab report doesn't show a test result for a certain pollutant, do not enter a zero; leave the box blank.
- Only enter numbers (not letters) for your test results unless otherwise noted. Do not add commas.

i Invalid Entry – Please try again

NH Town or City *

Anonymous

i Please Make A Selection

Routine Water Analysis

Units	Units
Arsenic (As) .009 mg/L	Lead (Pb) .016 mg/L
Chloride (Cl) 251 mg/L	Lead, Stagnant (Pb) mg/L
Copper (Cu) mg/L	Manganese (Mn) mg/L
Copper, Stagnant (Cu) mg/L	Nitrate-N 11 mg/L
Fluoride (F) mg/L	Nitrite-N 1.1 mg/L
Hardness as CaCO ₃ mg/L	pH units
Iron (Fe) mg/L	Sodium (Na) mg/L

Bacteria

Units	
Total Coliform mg/L	
or choose	
<input type="radio"/> Present	<input type="radio"/> Absent
E. coli mg/L	
or choose	
<input type="radio"/> Present	<input type="radio"/> Absent

Radionuclides

Units
Radon (Rn) pCi/L
Uranium (U) µg/L
Gross Alpha pCi/L

Submit

Reset

Printable Report

Part 1: “Results Summary”

[Click Here To Start Over](#)



Results Summary

✓ Value entered meets the Drinking Water Limit.

⚠ Value entered is close to the Drinking Water Limit.

✗ Value entered exceeds the Drinking Water Limit.

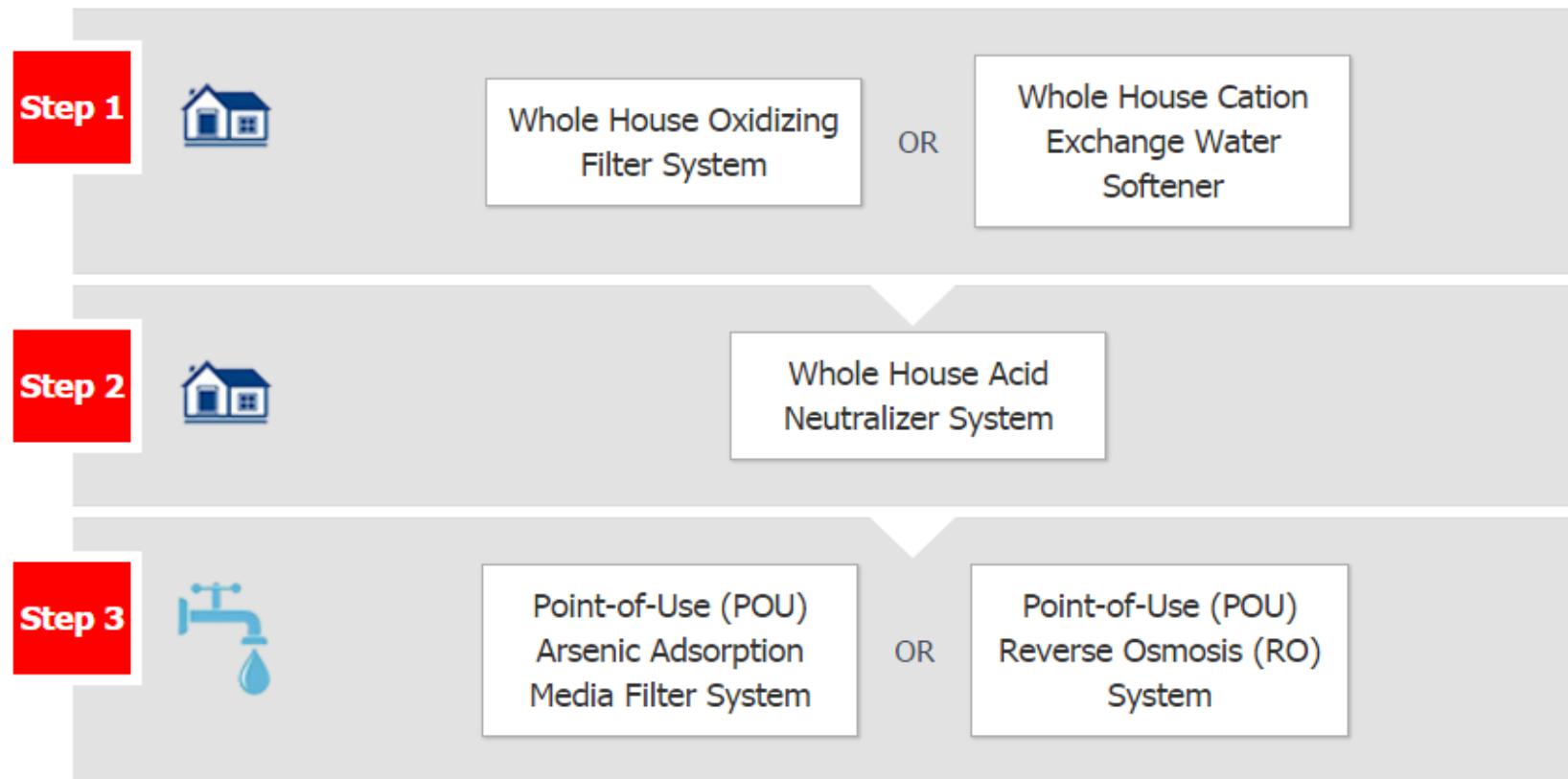
例行分析	水测试值输入	饮用水污染物限值或氡顾问级别	关于您的井水?
✗ Arsenic	.011 mg/L	0.01 mg/L	The value entered exceeds the drinking water standard
✓ Iron	.2 mg/L	0.3 mg/L	The value entered meets the drinking water guideline
✗ Lead Stagnant	.15 mg/L	0.015 mg/L	The value entered exceeds the drinking water standard
✗ Manganese	400 mg/L	0.05 mg/L	The value entered exceeds the drinking water guideline
✗ Nitrite-N	2 mg/L	1 mg/L	The value entered exceeds the drinking water standard. YOUR WATER IS NOT SAFE FOR BABIES UNDER SIX MONTHS OLD TO CONSUME.

Part 2: Treatment “Train”

Recommended Water Treatment To Remove Arsenic, Lead Stagnant, Manganese

The following recommended water treatment is based on the water quality information you entered. [Details concerning water treatment are below.](#)

Treatment Order



Part 3: Interpretation, Health, Treatment

Results Detail

✓ Value entered meets the Drinking Water Limit. ✗ Value entered exceeds the Drinking Water Limit.

⚠ Value entered is close to the Drinking Water Limit. ● A Value was Not Entered

例行分析	水测试值输入	饮用水污染物限值或氡顾问级别	关于您的井水
✗ Arsenic	.011 mg/L	0.01 mg/L	The value entered exceeds the drinking water standard

Interpretation of Results:

我的井水是否符合饮用水标准？**不**，您的水不符合联邦和州饮用水标准，因为它含有超过0.010 mg/L的砷。

Treatment Options:

我如何降低水中的砷含量？在除砷外，您的水还含有超过0.1 mg/L的铁和锰，必须予以考虑。安装以下水处理系统之一以降低水中的砷含量：

1. 一个NSF/ANSI标准42认证的全屋氧化过滤系统，该系统使用氧化剂降低水中的铁和锰含量。该系统对水的处理程度取决于水中的铁、pH和砷含量。

Health Concerns:

含砷水对健康有何影响？摄入含砷水，摄入量超过0.010 mg/L，与癌症风险增加有关，癌症部位包括皮肤、膀胱、肺、肾脏、鼻腔、肝脏或前列腺。砷还与神经系统、肺、心脏和免疫及内分泌（激素）系统疾病有关。个人健康风险取决于水中的砷含量、每天摄入的水量以及您饮用该水的年数。要降低砷摄入量，应治疗井水，使其降至0.010 mg/L以下。您仍可继续使用水来洗涤食物和餐具、刷牙、洗澡、淋浴和其他用途。

Be Well Informed Summary

- ❖ Identifies treatment technologies, not products.
- ❖ Addresses multiple or single contaminants.
- ❖ Yields PDF report to save or print.
- ❖ Provides links and offers phone support from DES.
- ❖ Link provided on most lab reports or found via web search for “Be Well Informed”.
- ❖ Developed by NHDES and shared with other states via EPA portal.

Questions



Please contact us anytime at
Bowdrinkingwater@bownh.gov