Private Wells

Know Your Water

BOW DRINKING WATER PROTECTION COMMITTEE

JULY 15, 2020

OVERVIEW

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

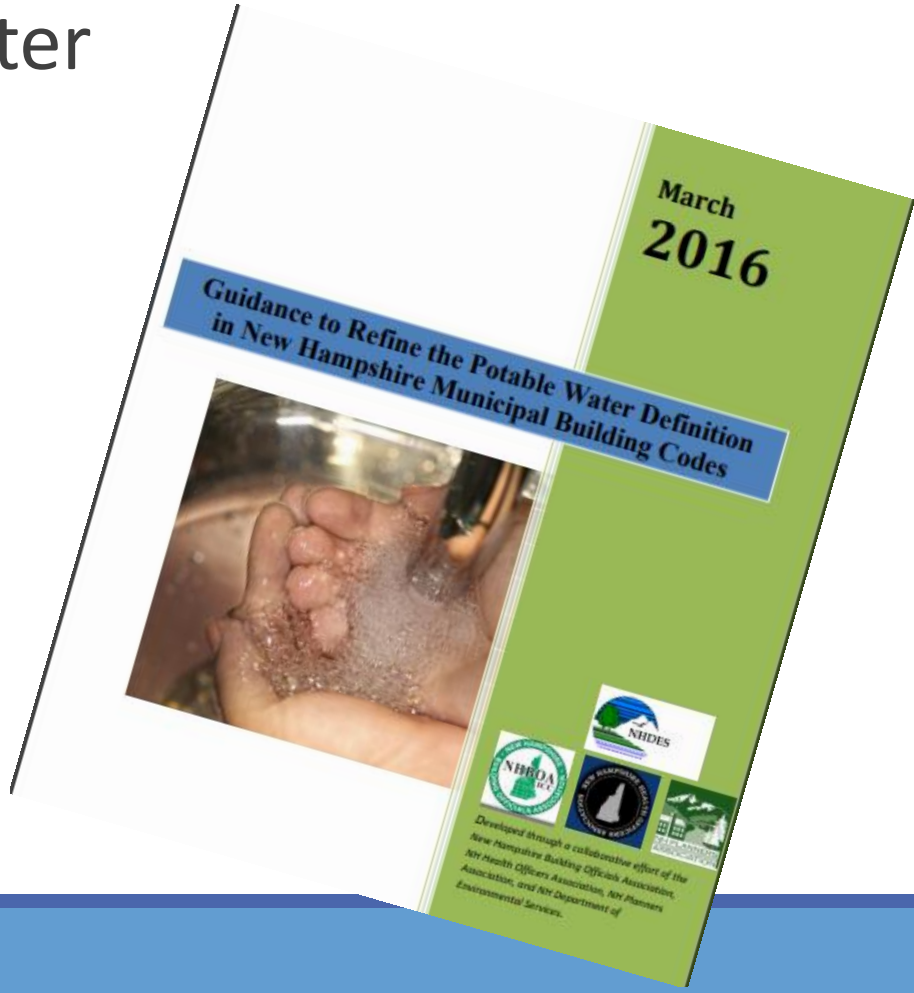
1 - The Rundown on Private Wells

- 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

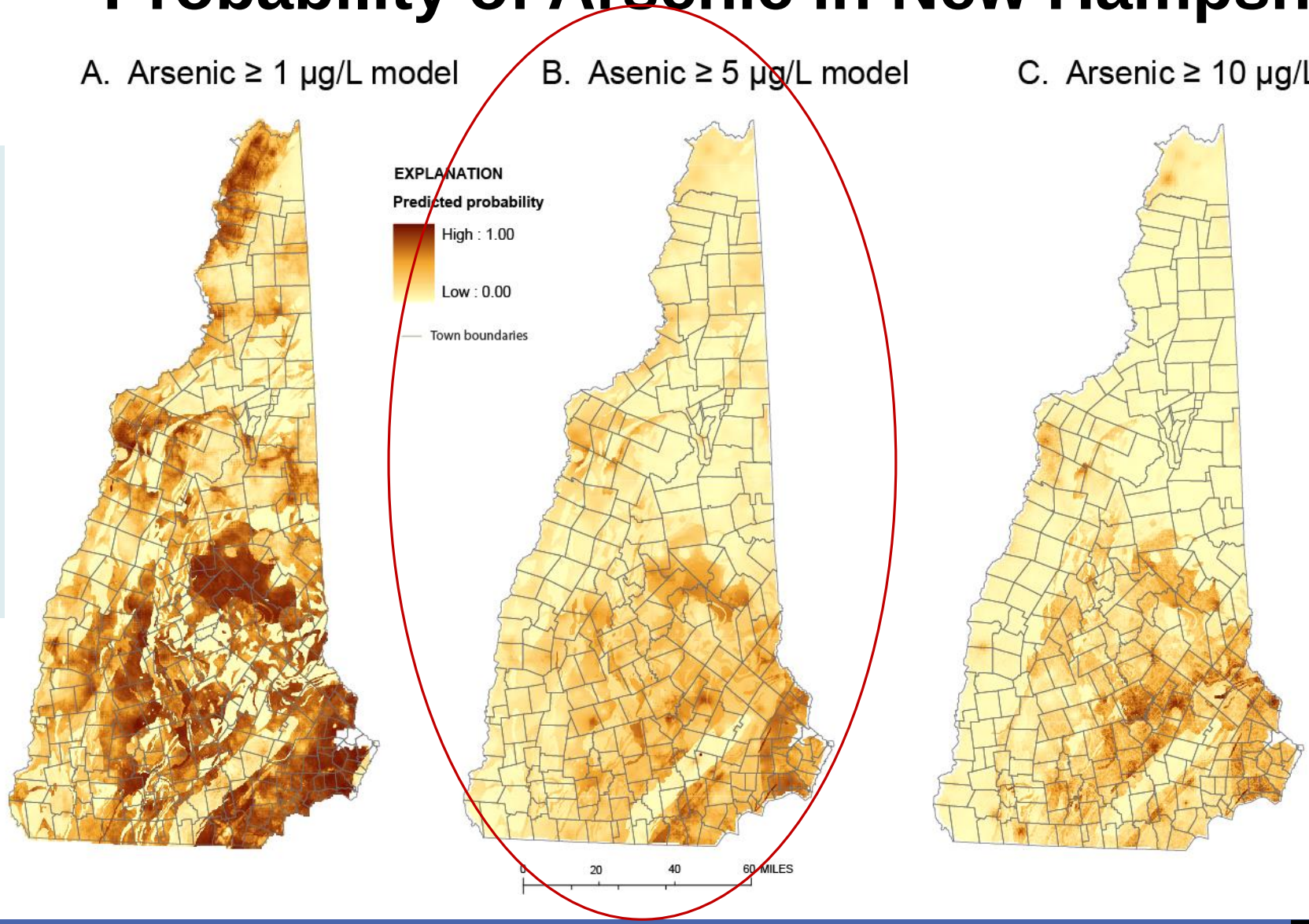


2 - Contaminants

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



USGS

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

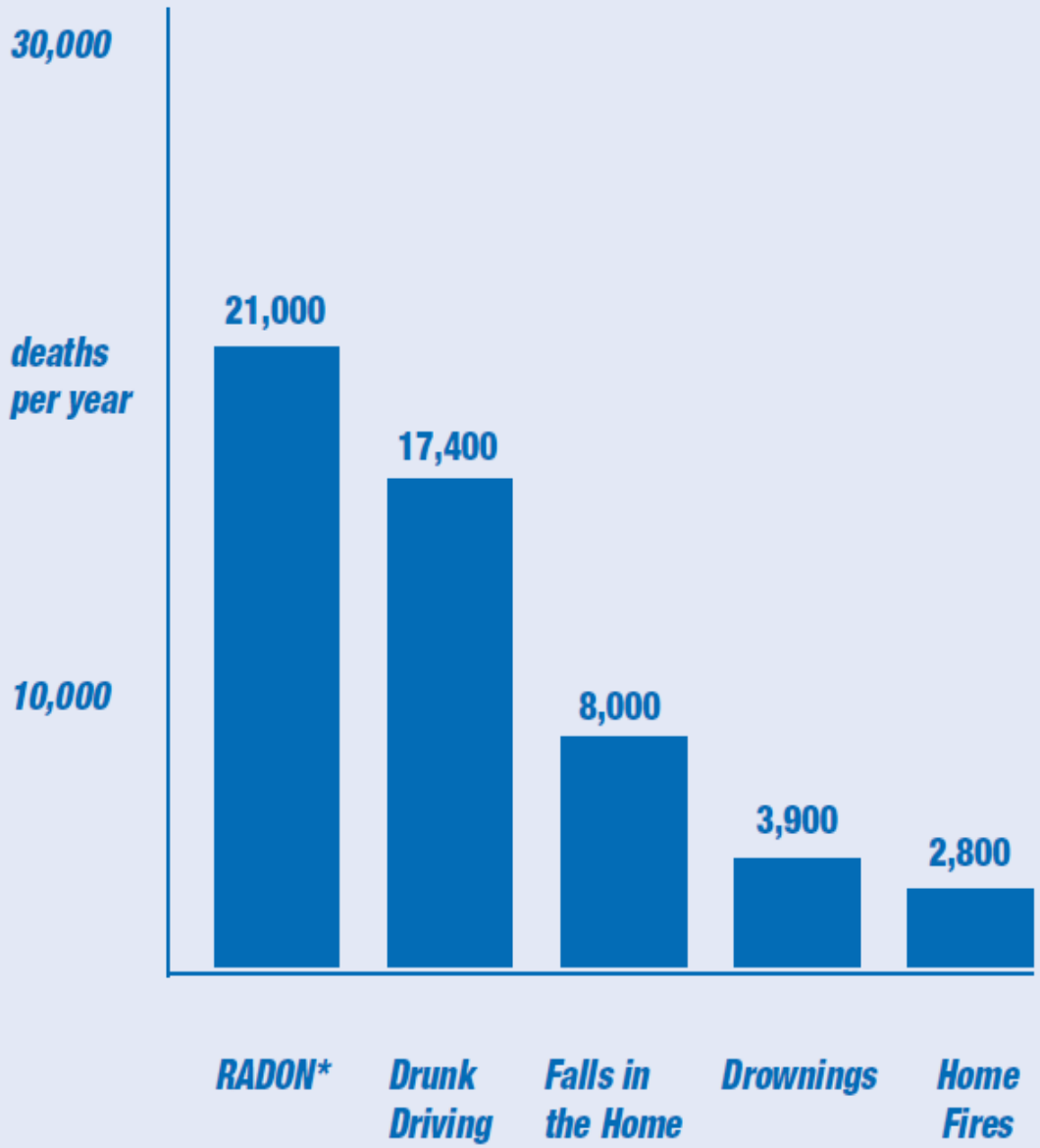
Hughes et al. (2011). “Arsenic Exposure and Toxicology: A Historical Perspective” *Toxicological Sci* 123(2): 305–332.

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.



*EPA (2018) Home Buyer's and Seller's Guide to Radon, https://www.epa.gov/sites/production/files/2015-05/documents/hmbuygud.pdf

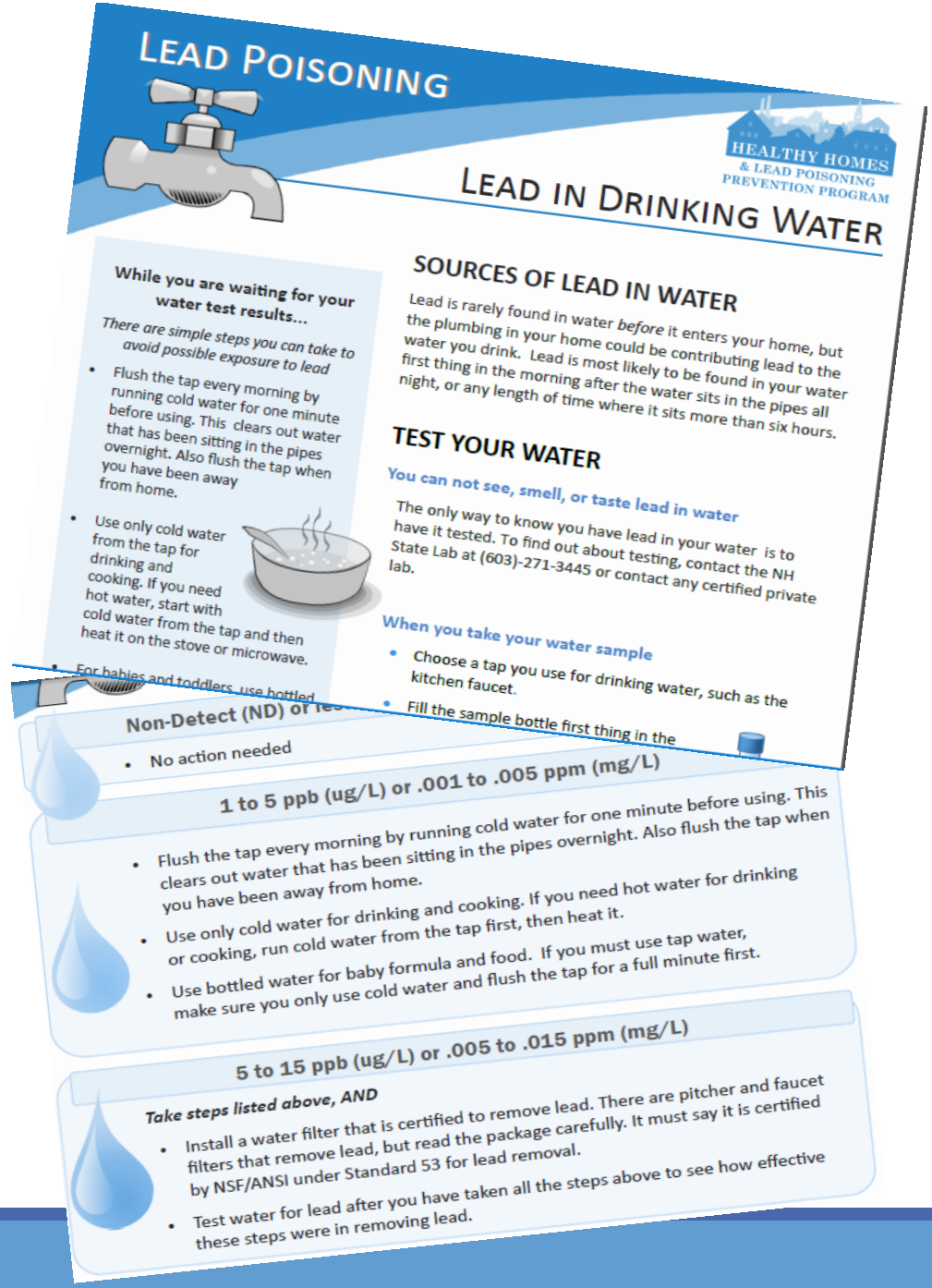
Lead – No Safe Level

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.



3 - Testing


BOW
COMMUNITY CENTER
WATER TEST KITS HERE
SAT JUNE 1ST 9-11AM
AT YARD SALE

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

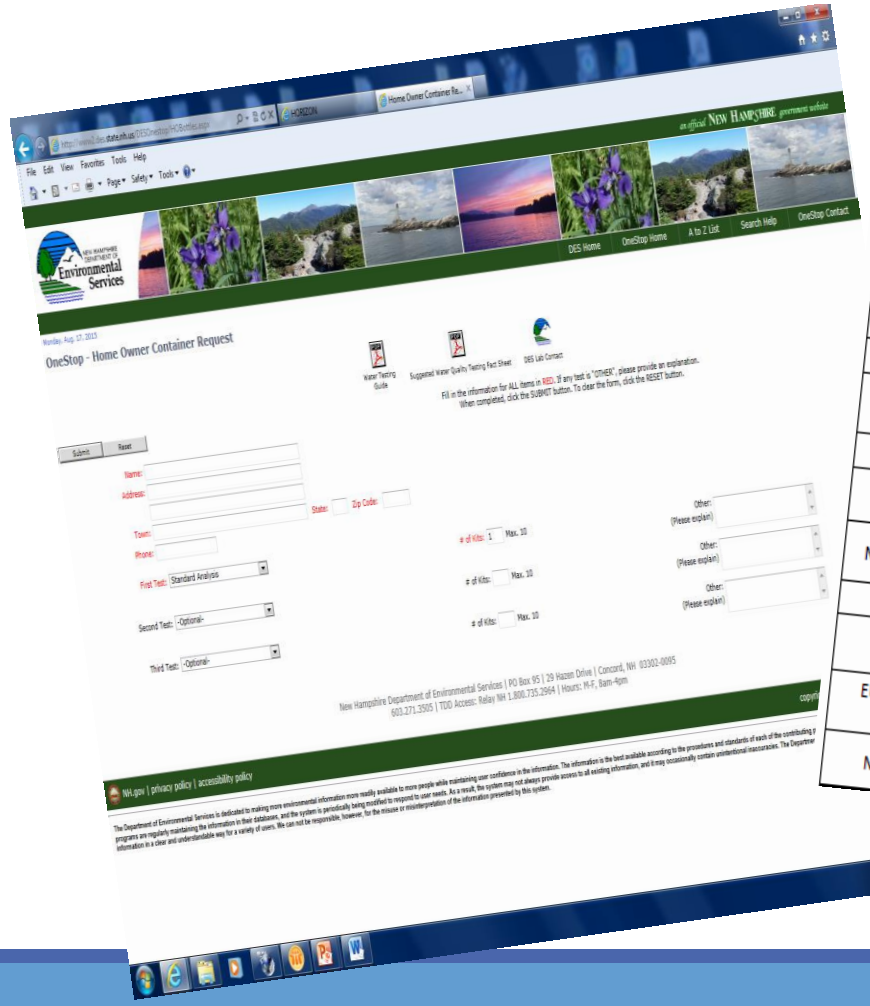


Table 1
Accredited Labs Providing Well Water Quality Testing Services in New Hampshire and Neighboring States[1]

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
CHEMSERVE 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/lsu/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.NTLLABS.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%

Source: NHDHHS Public Health Laboratory 2016 and BDPWC 2018

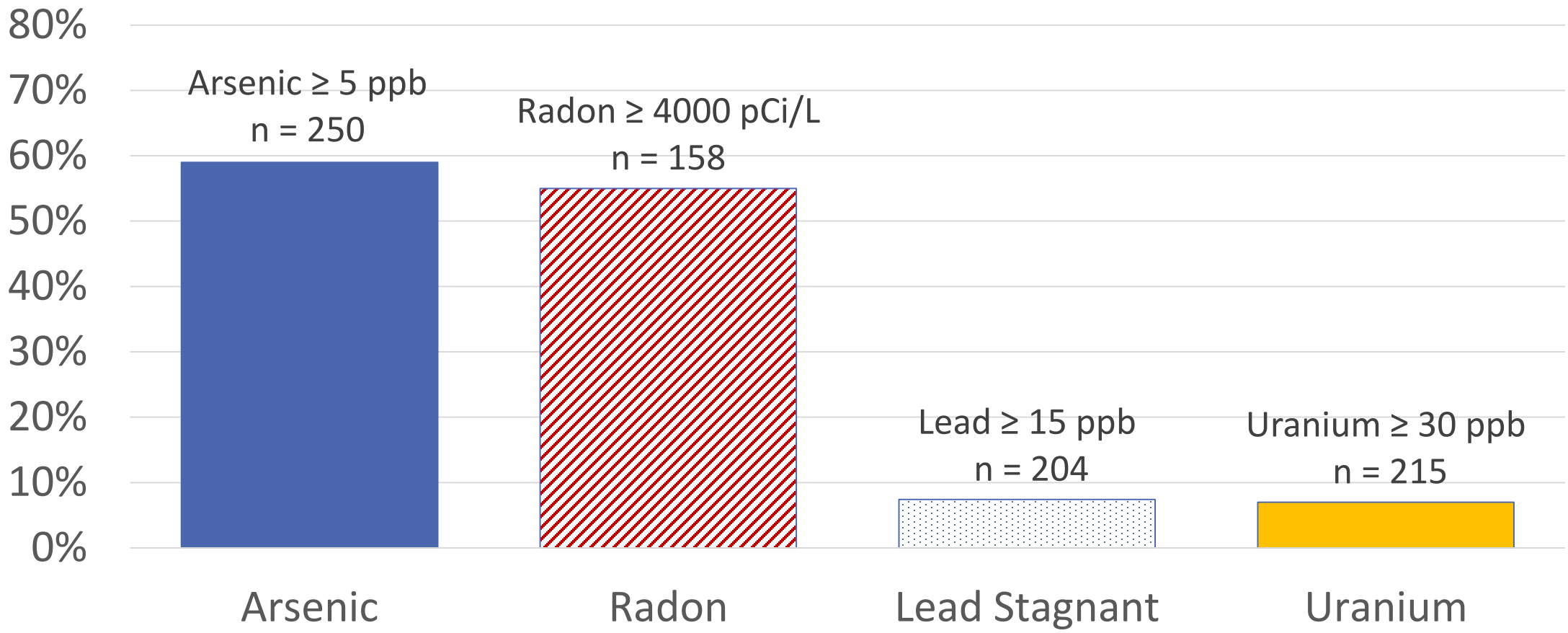
Bow Private Well Data 2015-2019

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 %
Lead Flushed	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

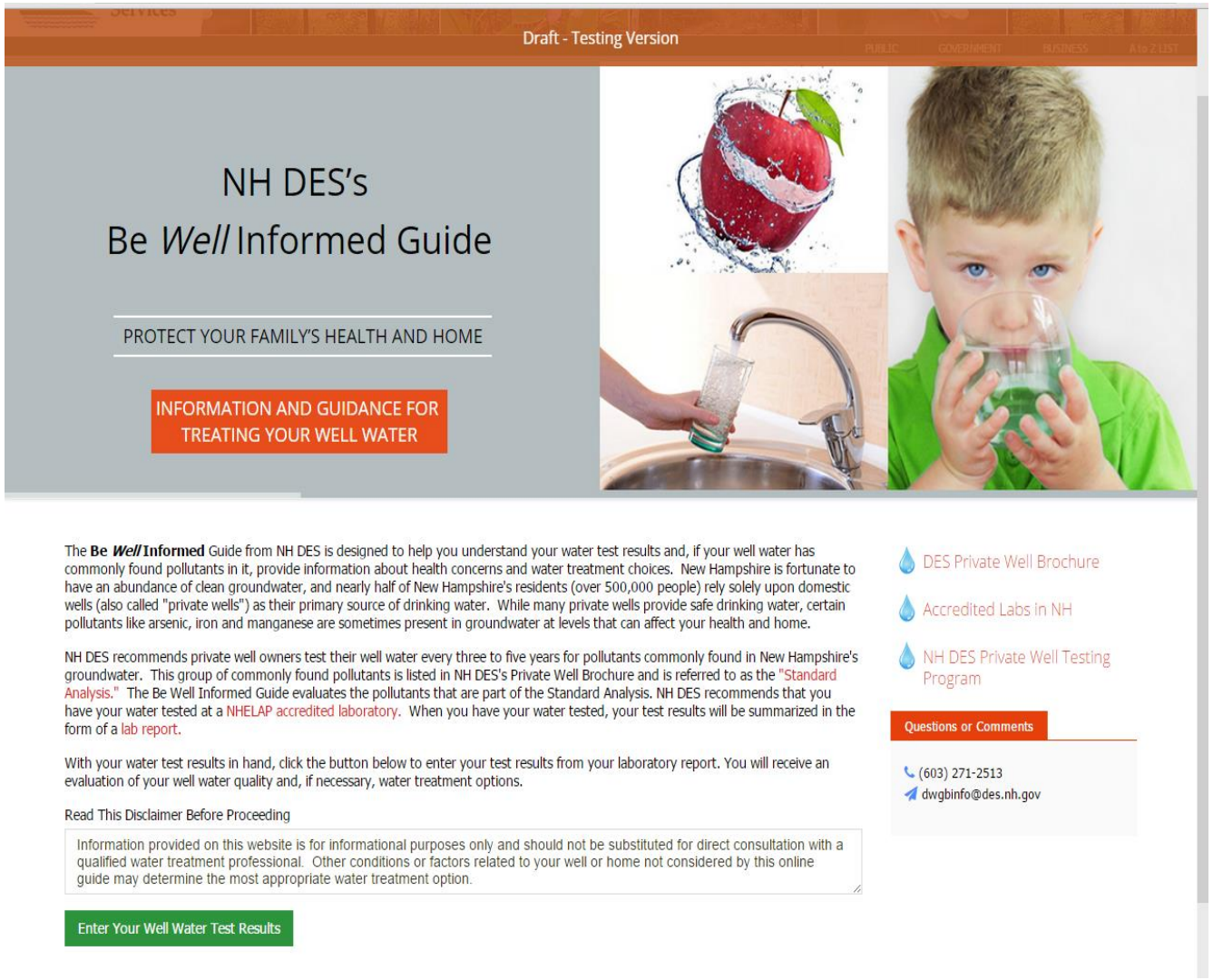
Whole House treatment is used for:

- 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

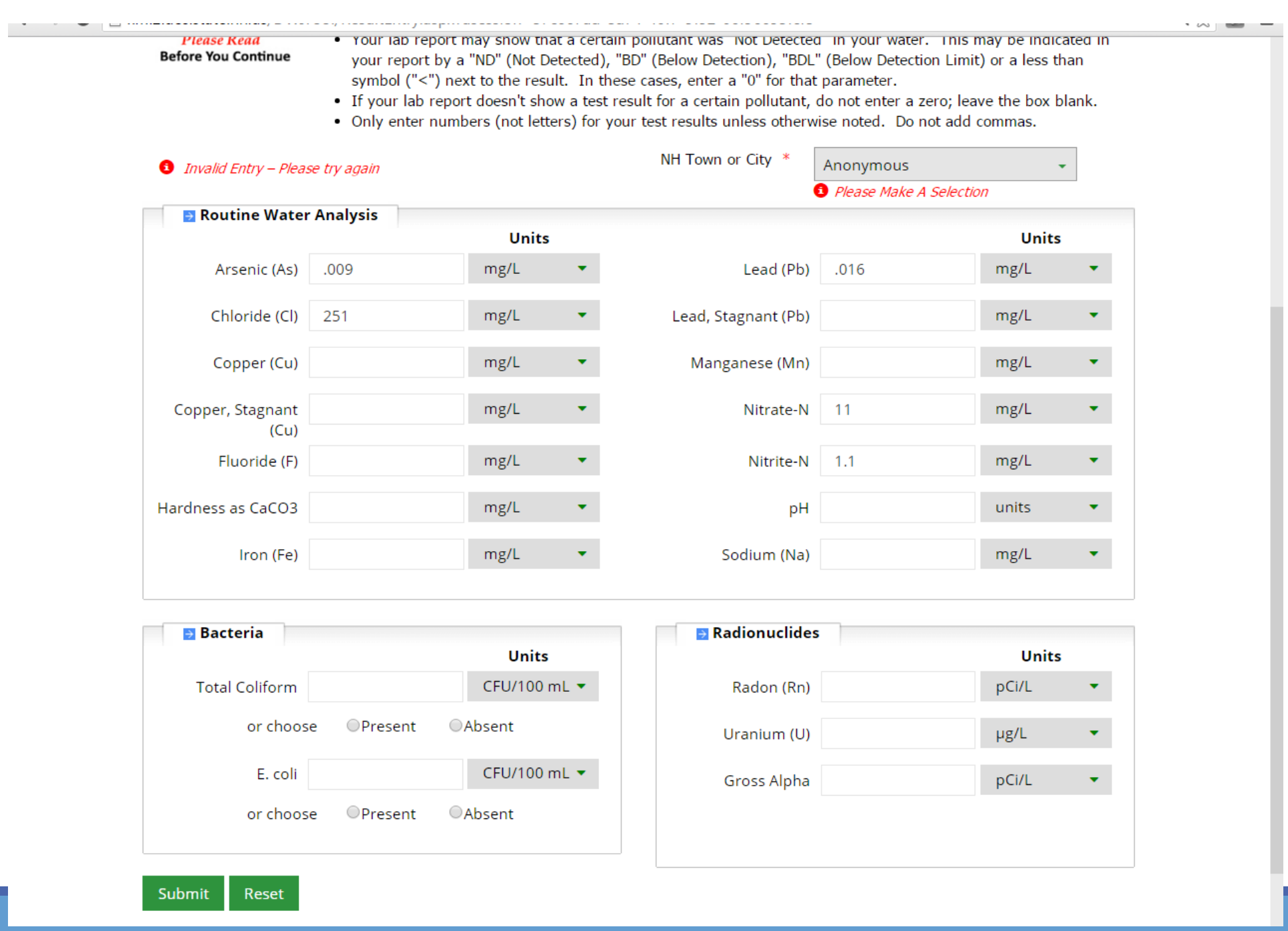
- Interprets your lab results
- Compares to water quality standards
- Recommends treatment steps for multiple contaminants
- Lists health effects



Enter your lab test results on Be *Well* Informed

Parameter list is the Standard Analysis + Rads

Be sure to select the correct units



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.

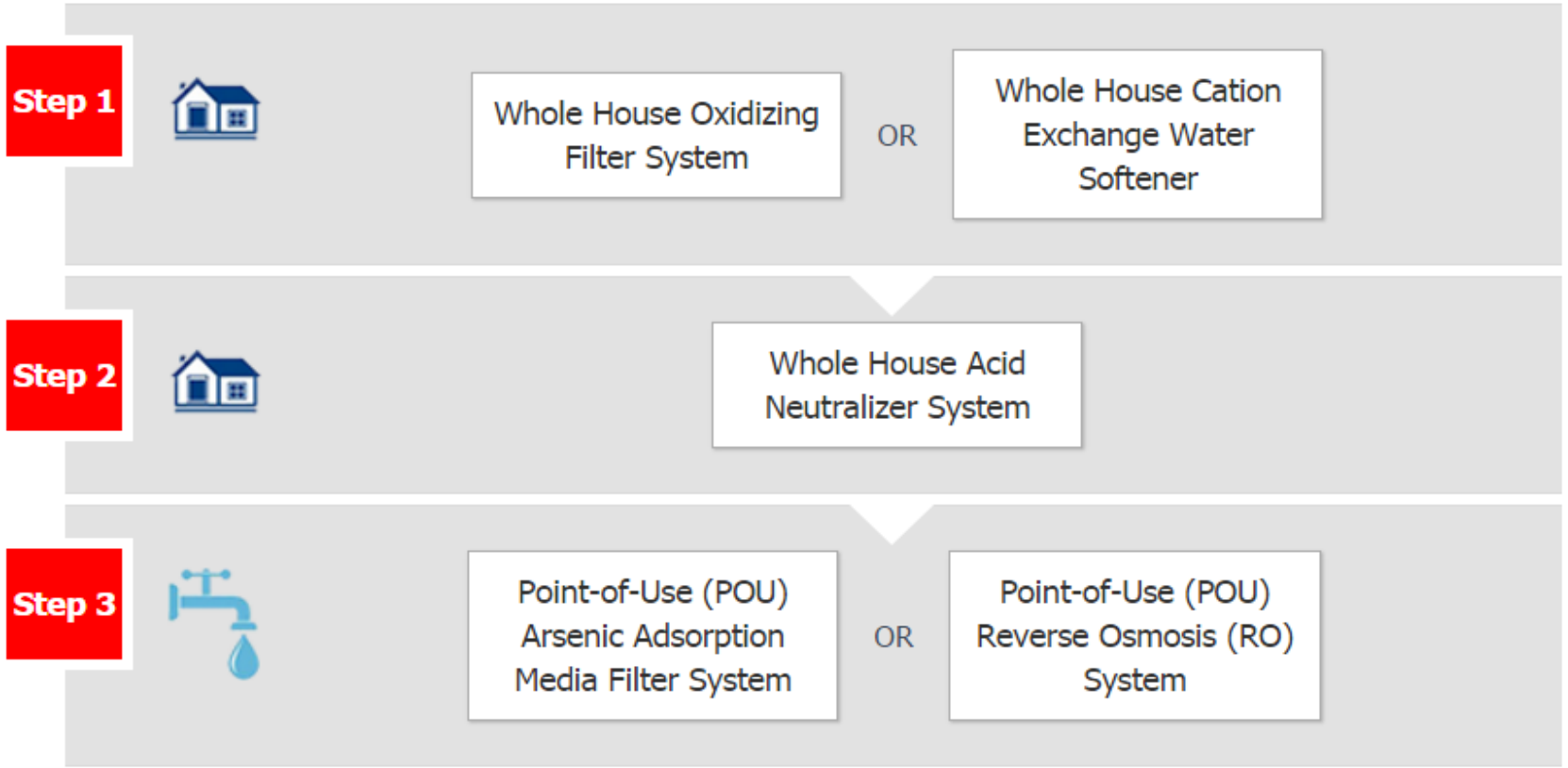
Routine Analysis		Water Test Value Entered	Drinking Water Contaminant Limit or Radon Advisory Level	About Your Well Water?
✖	Arsenic	.011 mg/L	0.01 mg/L	The value entered exceeds the drinking water standard
✔	Iron	.2 mg/L	0.3 mg/L	The value entered meets the drinking water guideline
✖	Lead Stagnant	.15 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

Routine Analysis	Water Test Value Entered	Drinking Water Contaminant Limit or Radon Advisory Level	About Your Well Water?
✖ Arsenic	.011 mg/L	0.01 mg/L	The value entered exceeds the drinking water standard

Interpretation of Results:

Does my well water meet the drinking water standard for arsenic? No, your water does not meet federal and state drinking water standards as it contains more than 0.010 mg/L of arsenic.

Treatment Options:

How can I reduce the level of arsenic in my water? In addition to arsenic, y
contains more than 0.1 mg/L of iron and manganese, which must be considered in
system. Install one of the following water treatment systems to reduce the level of
water:

1. An NSF/ANSI Standard 42 certified whole house oxidizing filter system that uses
oxidizing agent to reduce the level of iron and manganese. This type of system
your water, though by how much depends on the levels of iron, pH, and arsenic

Health Concerns:

Can consuming water containing arsenic affect my health? Consuming water containing more than 0.010 mg/L of arsenic is associated with an increased risk of cancer of the skin, bladder, lungs, kidneys, nasal passages, liver, or prostate as well as diseases of the nerves, lungs, heart, and immune and endocrine (hormonal) systems. Your individual health risk depends on the amount of arsenic in your water, how much of the water you drink each day, and the number of years you drink the water. To reduce your exposure to arsenic in your well water, treat the water that you use for drinking and cooking to a level less than 0.010 mg/L. You can continue to use your water for washing food and dishes, brushing your teeth, bathing, showering, and for other uses.

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