

Private Wells in Portsmouth

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OVERVIEW

Private wells in New Hampshire

Private wells in Portsmouth

Contaminants of concern

Recommendations

- Private well users
- SWAG

Private Wells in New Hampshire

Main source of drinking water for approximately 46% of New Hampshire's population, ~ 520,000 people.

No statewide testing or treatment requirement(s)

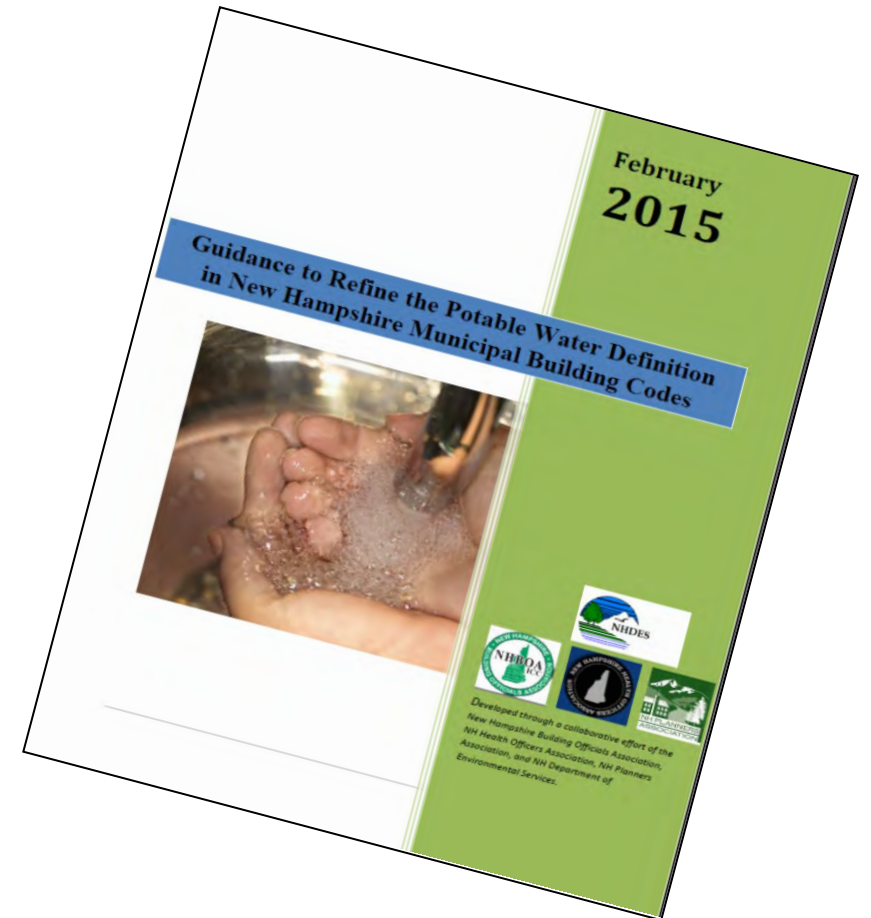
Some municipalities require testing



Municipalities That Require Private Well Testing

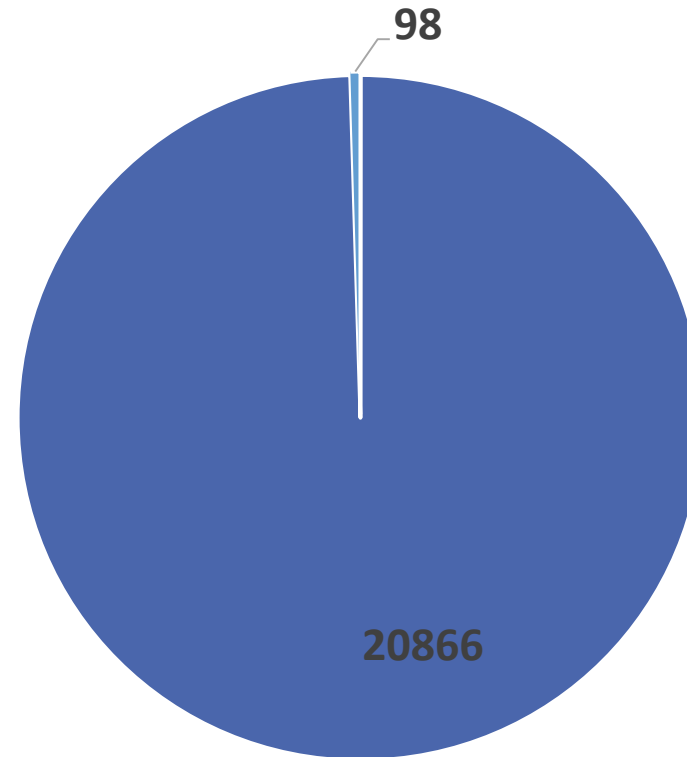
Bow, Derry, Pelham, Salem, Windham, Chester

- ✓ Require testing to receive a CO
- ✓ Cite RSA 147:1 Public Health Authority
- ✓ Refer to DES's Standard Analysis (tests)
- ✓ Most require water quality testing (w/o treatment) vs. treatment
- ✓ Goffstown requires compliance with standards to be "potable"



Portsmouth – Water supply at Home

Population served (2005 est.)

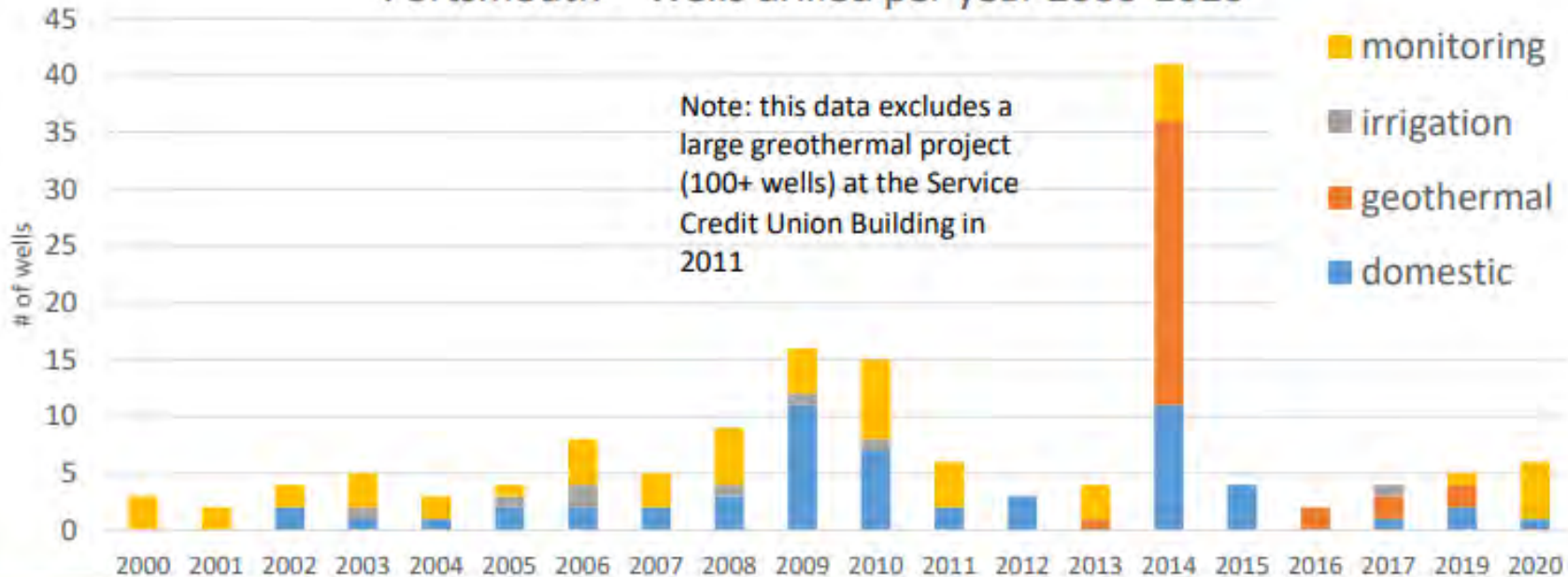


NHDES Water Well Inventory includes 63 domestic water supply wells in Portsmouth

■ Community Water Systems ■ Private Wells

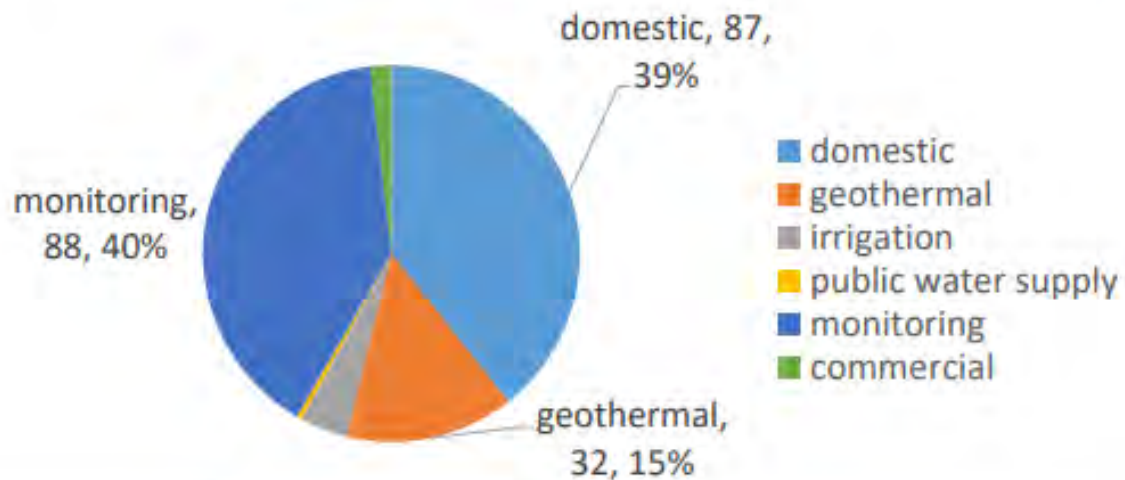
Source: USGS

Portsmouth - Wells drilled per year 2000-2020



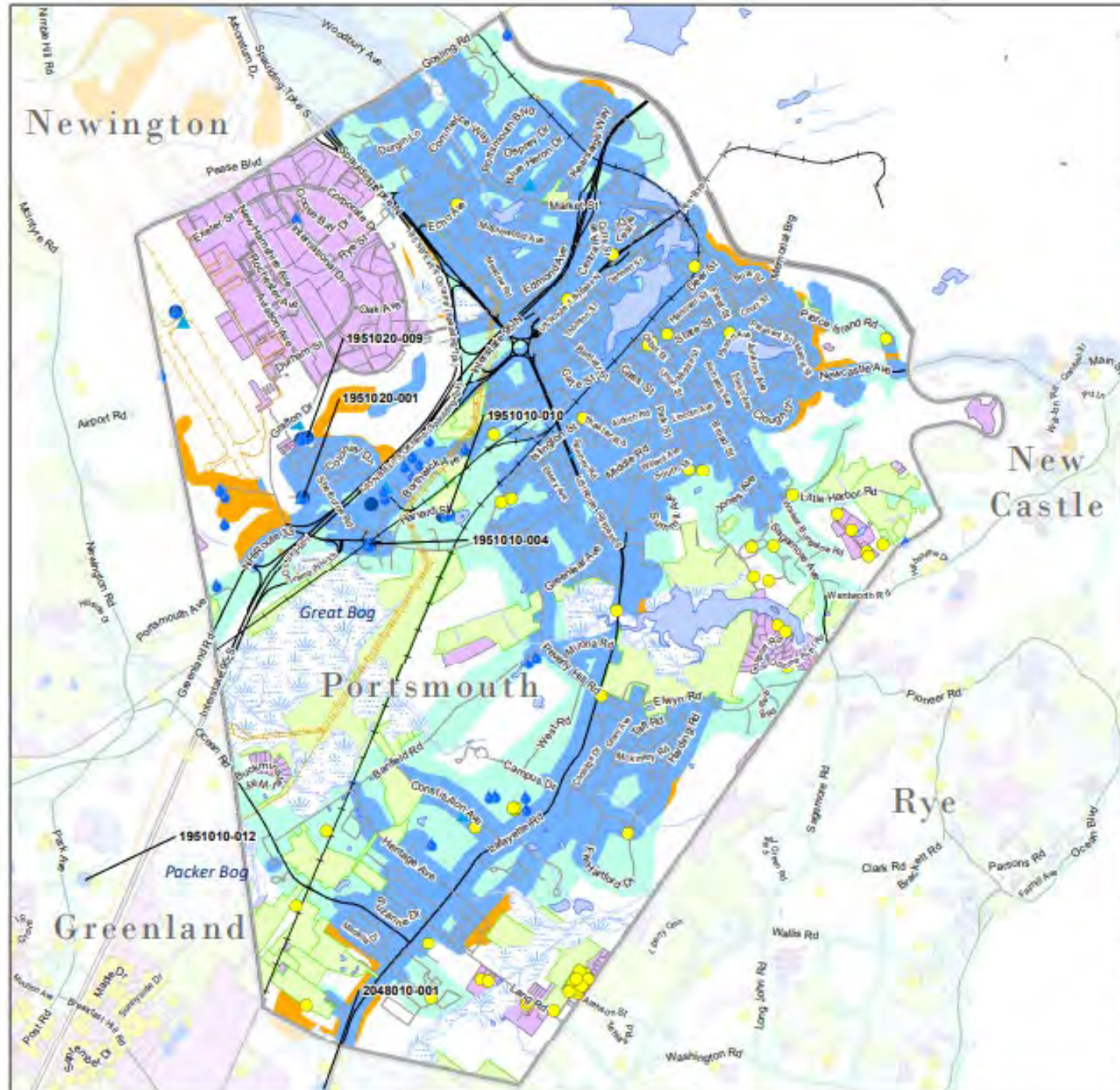
Well Type	Count
domestic	87
geothermal	32
irrigation	9
public water supply	1
monitoring	88
commercial	4
Grand Total	221

Portsmouth - Well Reports 1984-2020



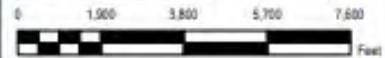
TOWN OF PORTSMOUTH

WATER SUPPLY INVENTORY



- Public Water Supply Source
- ▲ PWS Facility or Pump House
- Private Water Well Inventory
- Registered Water Users
- Likely Private Water Supply Parcels
- Water & Sewer Service Area
- Sewer Service Area
- Water Service Area
- ▭ Town Boundaries
- ▭ Conservation Lands
- ~ Primary Route
- ~ Other road or street
- ~ Class VI Road
- Railroad
- Transmission or Pipeline
- River or Stream
- Lake or Pond
- Swamp or Marsh

Notes:
 The data presented is under constant revision as new information is available. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Information on this map shall be considered security sensitive. Do not circulate or publish.



NH Private Wells

Common Contaminants

		Portsmouth	Percent Exceeding Limit	
Contaminant	Health Limit	Wells Tested*	Rockingham County	Statewide
Arsenic	> 0.005 mg/L	<=20	31%	25%
Chloride	> 250 mg/L	<=20	7%	3%
Copper (flushed)	> 1.3 mg/L	<=20	1%	1%
Copper (stagnant)	> 1.3 mg/L	<=20	10%	12%
Fluoride	> 4 mg/L	<=20	0%	1%
Iron	> 0.3 mg/L	<=20	14%	17%
Lead (flushed)	> 0.015 mg/L	<=20	1%	2%
Lead (stagnant)	> 0.015 mg/L	<=20	12%	13%
Manganese	> 0.30 mg/L	<=20	6%	5%
Nitrate	> 10 mg/L	<=20	1%	0%
Nitrite	> 1 mg/L	<=20	0%	0%
Radon (testing advisory)	> 2000 pCi/L	<=20	32%	30%
Sodium	> 20 mg/L	<=20	55%	34%
Uranium	> 30 mg/L	<=20	4%	4%

*Data Source: EPHT Combined NH DES/NH Public Health Laboratories Data Set. Does not include private labs
Years = 2006 to August of 2020.

Contaminants – natural and human-caused

Human-caused contaminants in groundwater in some areas.

- Petroleum components, e.g. MtBE
- PFAS – thousands of wells above NH standards

Human-caused in plumbing and fixtures: lead and copper

Naturally occurring contaminants in perspective:

- 30% of samples in USGS seacoast study above MCLs for naturally occurring metals or lead
- 65% (estimate – if low threshold for lead)

CONTAMINANTS OF CONCERN

*Well Water Contaminants Measured as part of Targeted Sampling in Auburn, NH**

Contaminant	Associated health risk
Arsenic	Certain types of cancer, diabetes, heart disease and skin lesions; short term exposure among pregnant women associated with impact to fetal growth and increased infections in first year of life of infants.
Copper	Nausea, vomiting, diarrhea, and stomach cramps. Some infants and children, people with liver disease, and people with Wilson's disease may experience more significant health effects such as kidney and liver damage.
Lead	Behavior and learning problems, lowered IQ, hyperactivity, slowed growth, hearing problems and anemia in children; can cause reduced fetal growth and premature birth.
Manganese	Neurological effects in infants and children.
Uranium	Certain types of cancer, kidney damage.

Additional Contaminants Commonly Found in NH Groundwater

Contaminant	Associated health risk
Radon	Certain types of cancer, particularly lung cancer. The primary risk of radon exposure is from breathing it in the air.
Bacteria	Diarrhea, vomiting, cramps, nausea, headaches, fever, fatigue. Infants, children, elderly people, and people with weakened immune systems are more likely to get sick or even die from pathogens in drinking water.

Evaluation of Biomonitoring Results by Home Water Source:

Key Findings



p-value: <0.05

TrACE private well users had significantly different and higher average levels than public drinking water users for:

Blood metals: lead

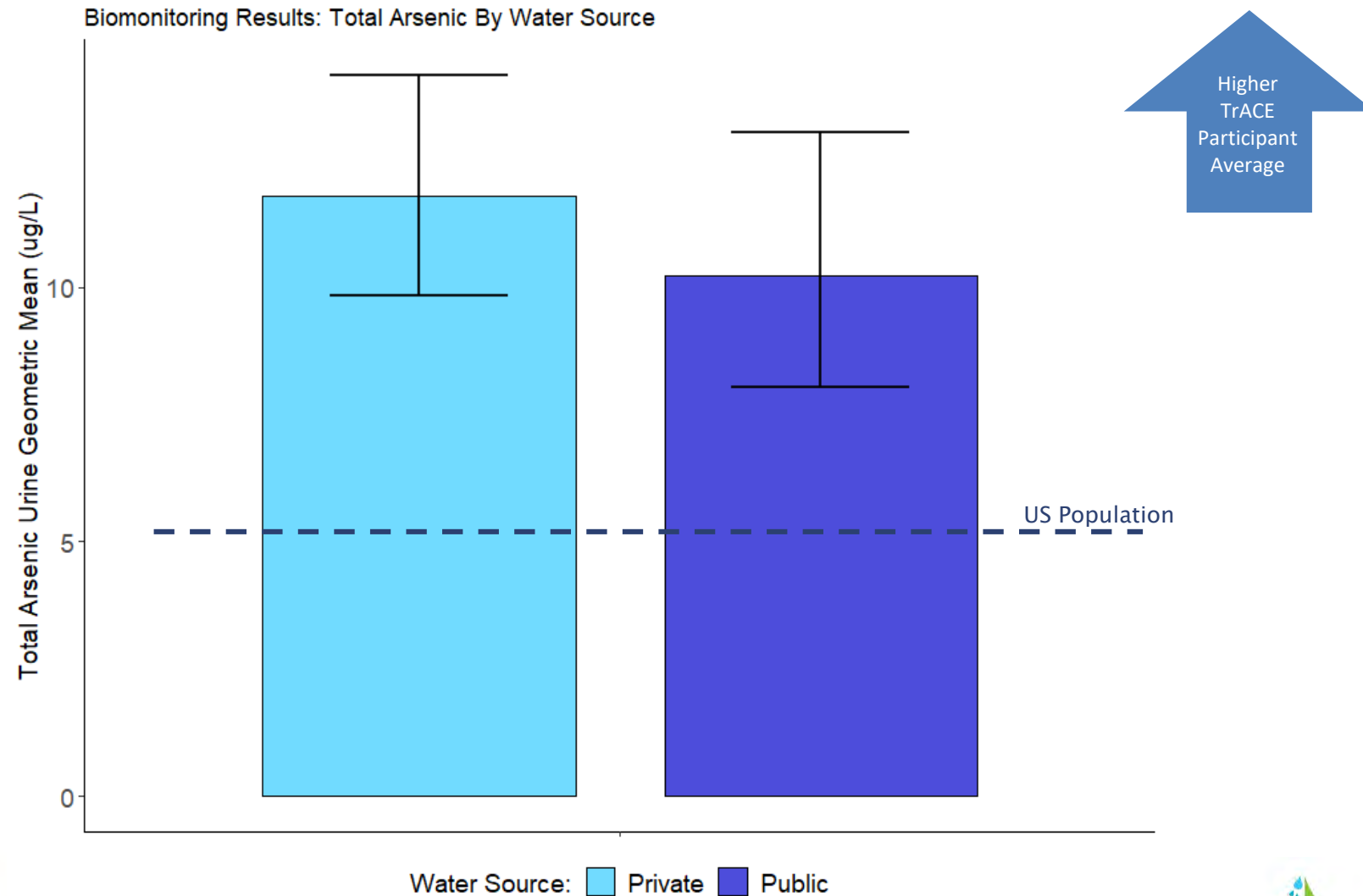
Serum PFAS: PFOS

Urine metals: uranium

TrACE public drinking water users had significantly different and higher average levels than private drinking water users for:

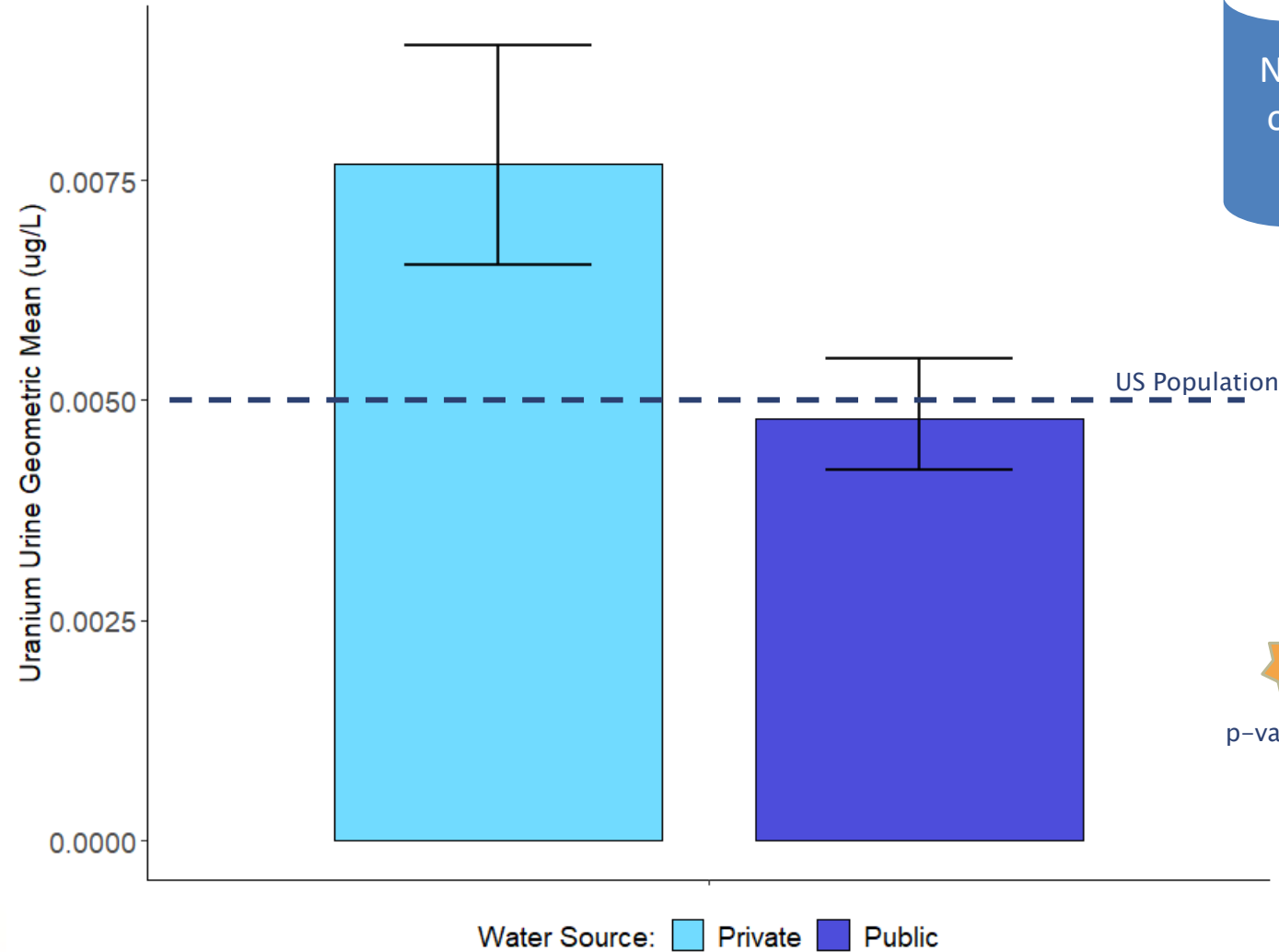
Serum PFAS: PFOA

Evaluation of Biomonitoring Results by Home Water Source: Urine Total Arsenic



Evaluation of Biomonitoring Results by Home Water Source: Urine Uranium

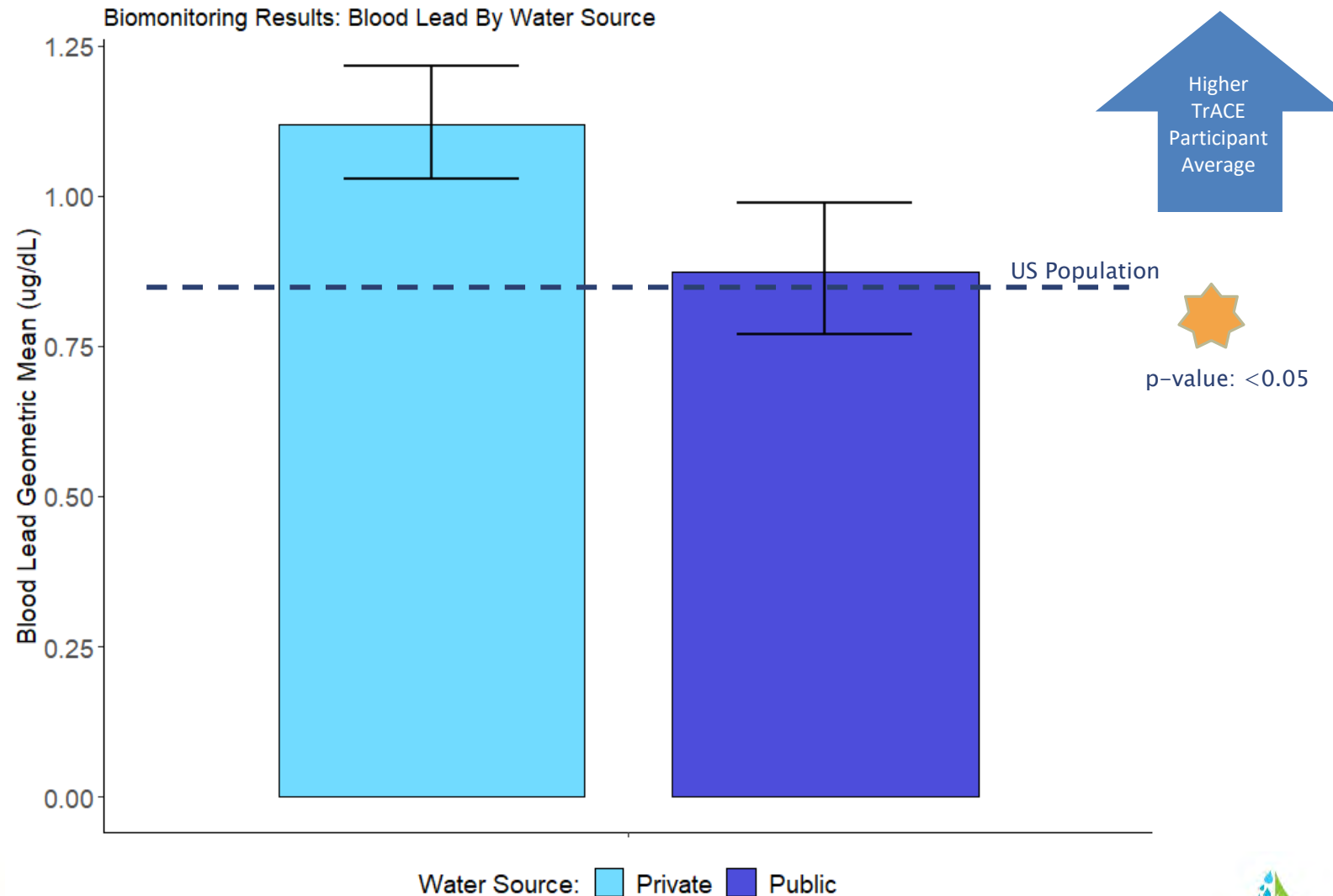
Biomonitoring Results: Uranium By Water Source



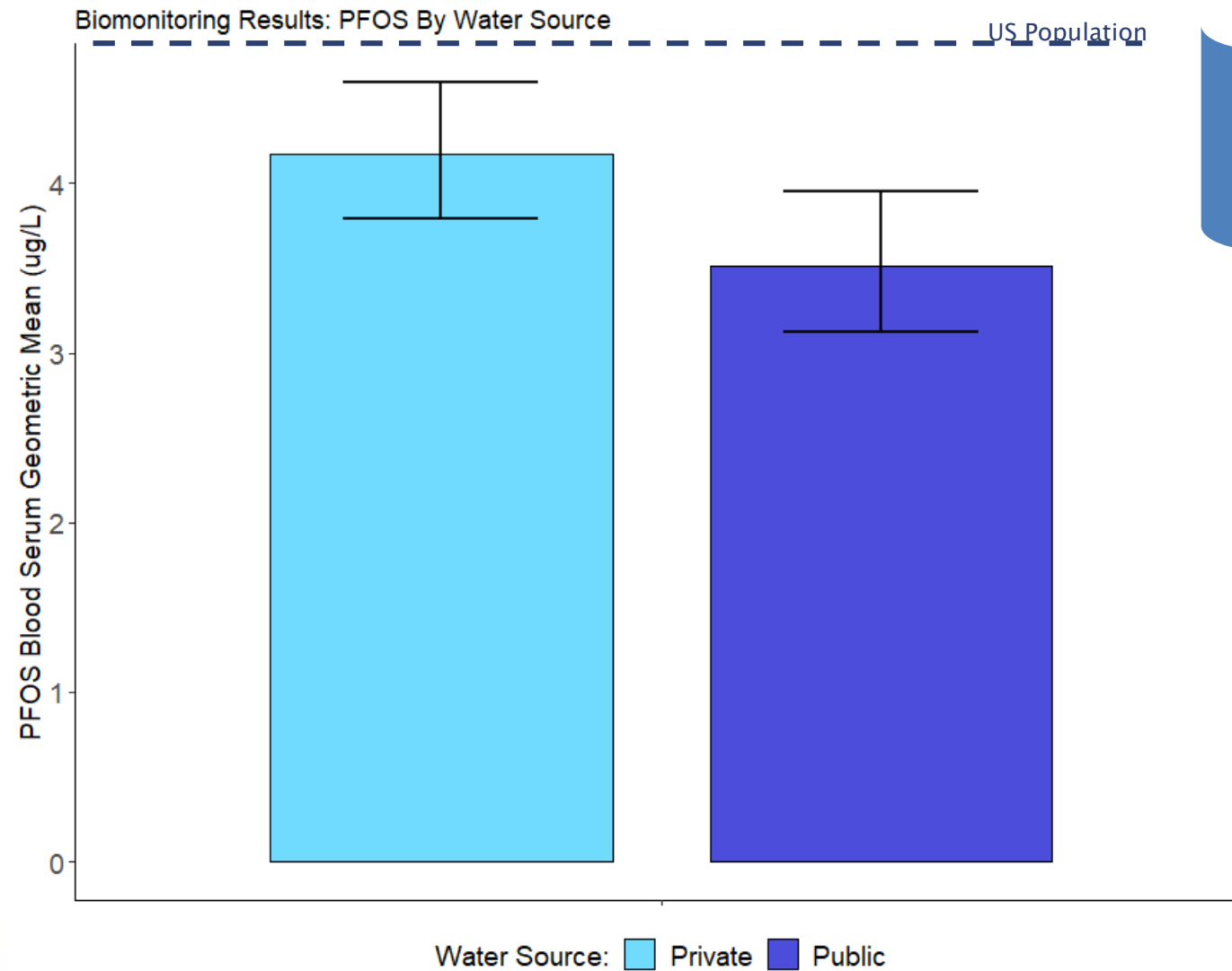
NH Analyte of Interest

p-value: <math><0.05</math>

Evaluation of Biomonitoring Results by Home Water Source: Blood Lead



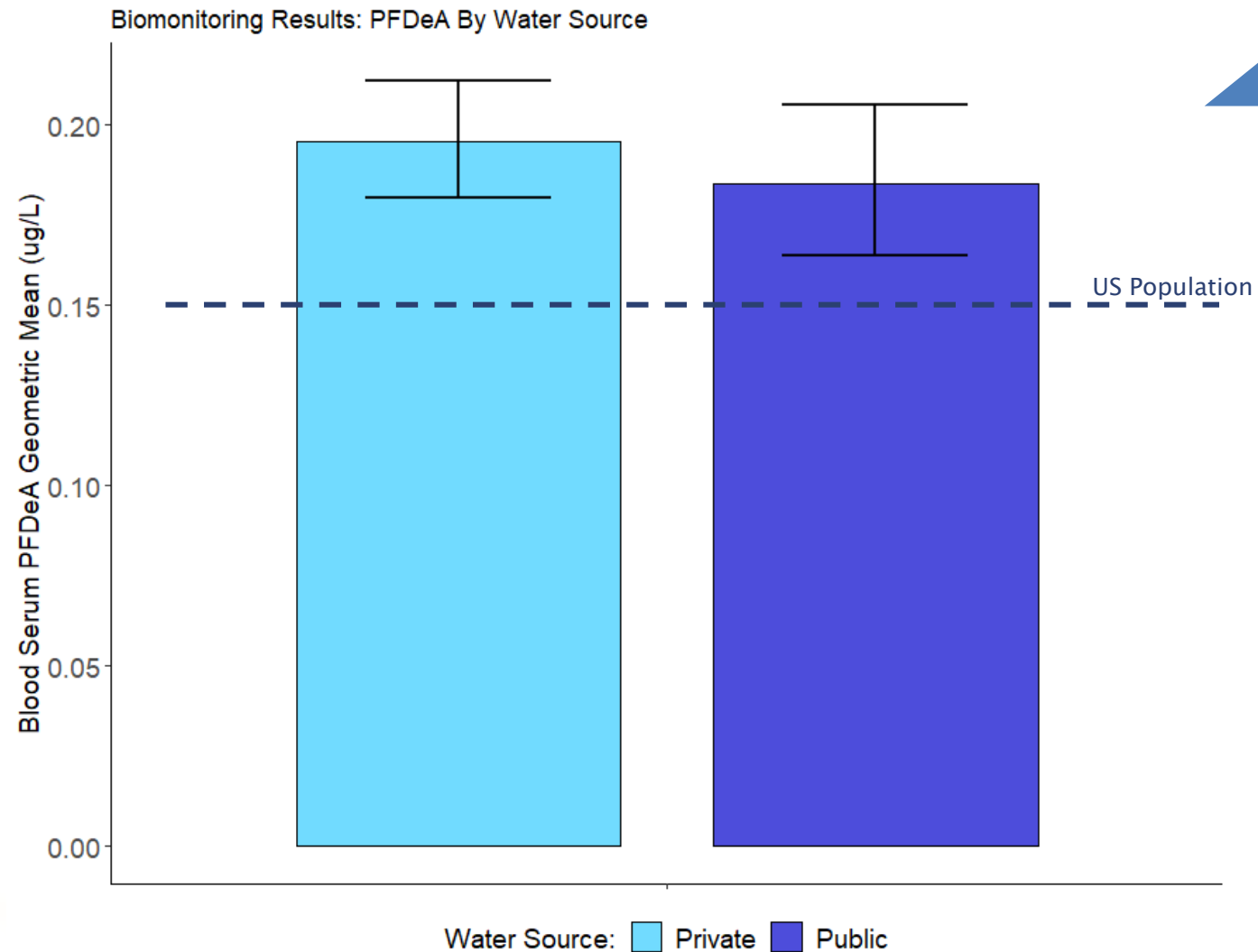
Evaluation of Biomonitoring Results by Home Water Source: Serum PFOS



NH Analyte of Interest


p-value: <0.05

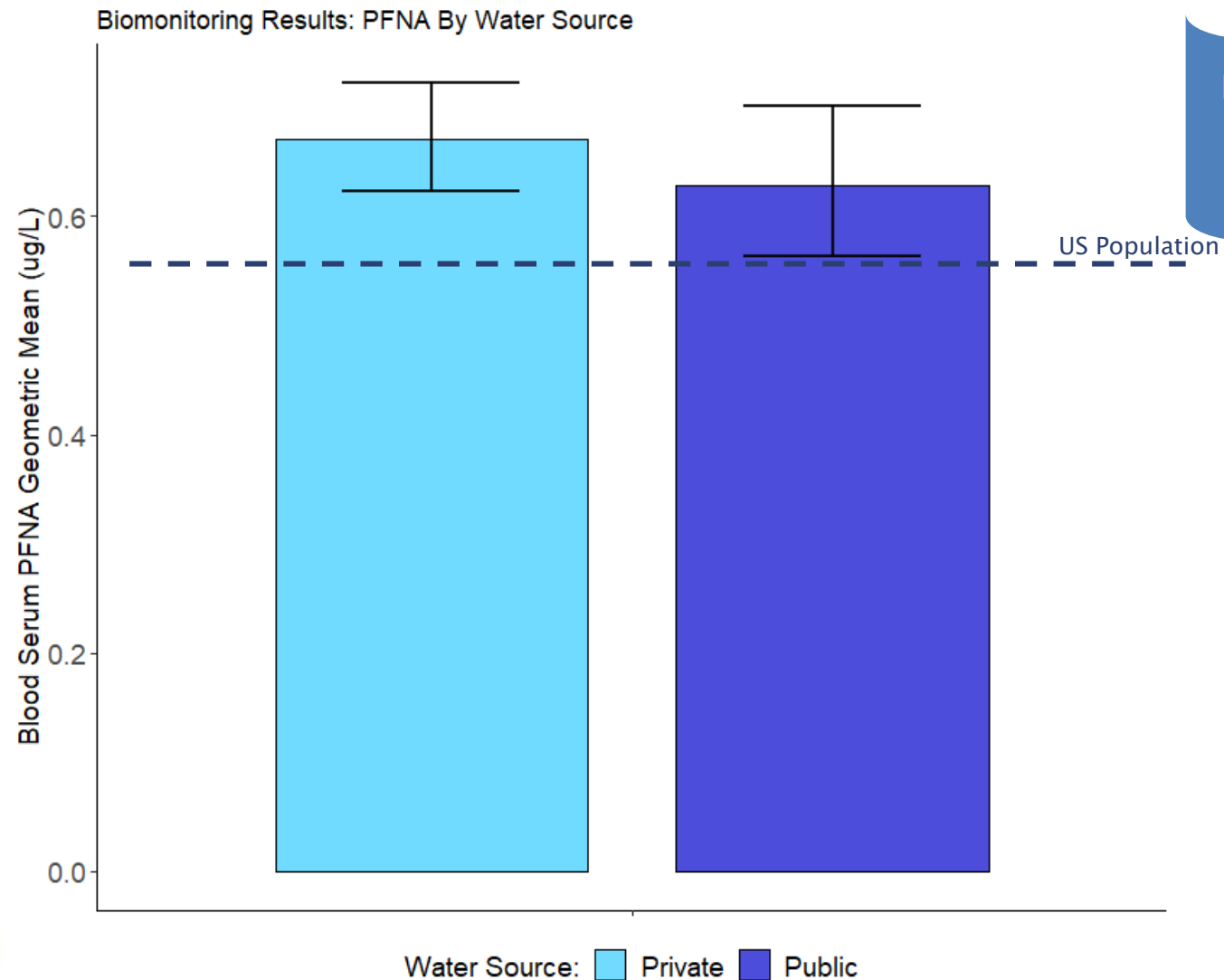
Evaluation of Biomonitoring Results by Home Water Source: Serum PFDeA*



Higher TrACE Participant Average

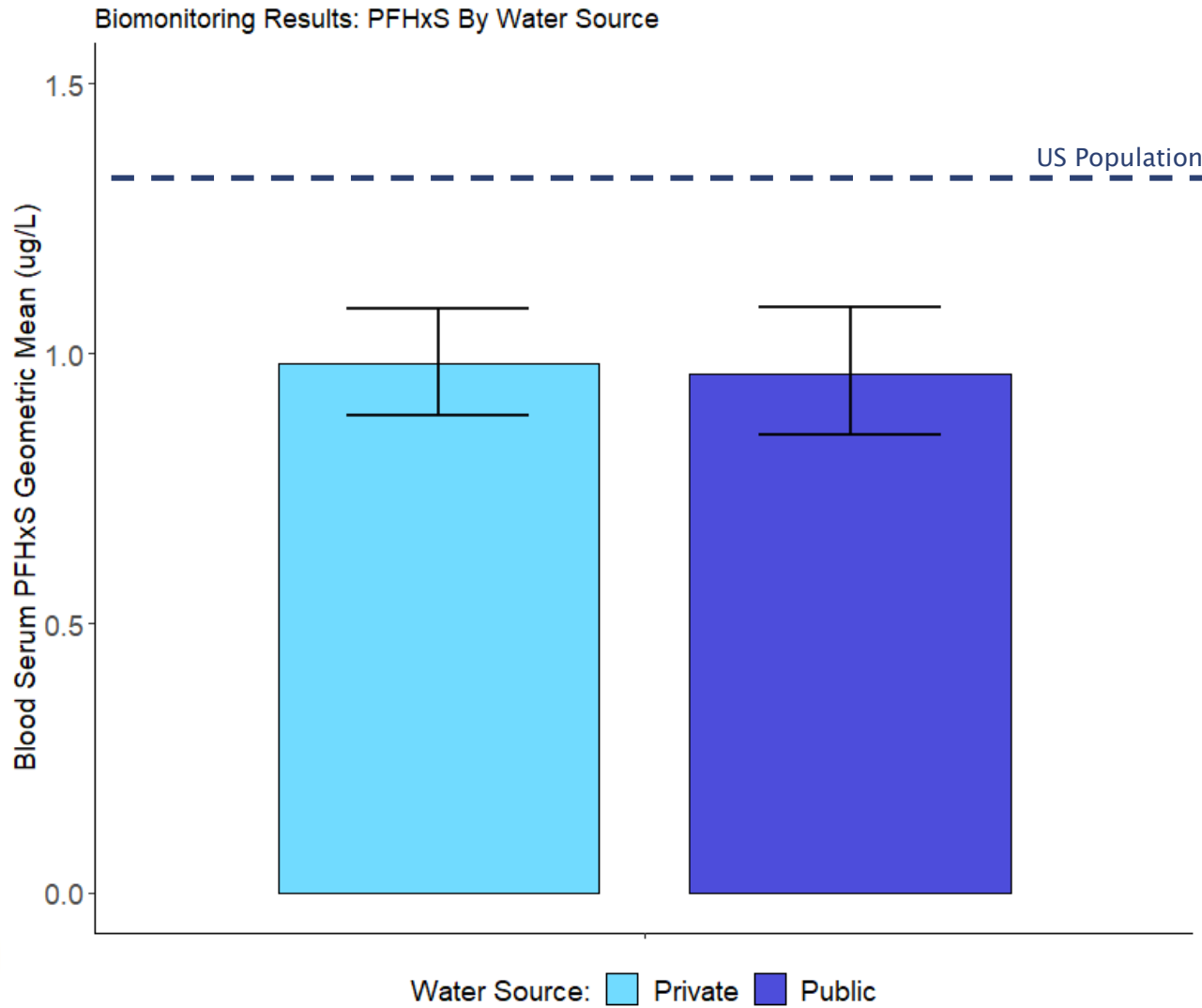
*Member of the PFAS family

Evaluation of Biomonitoring Results by Home Water Source: Serum PFNA



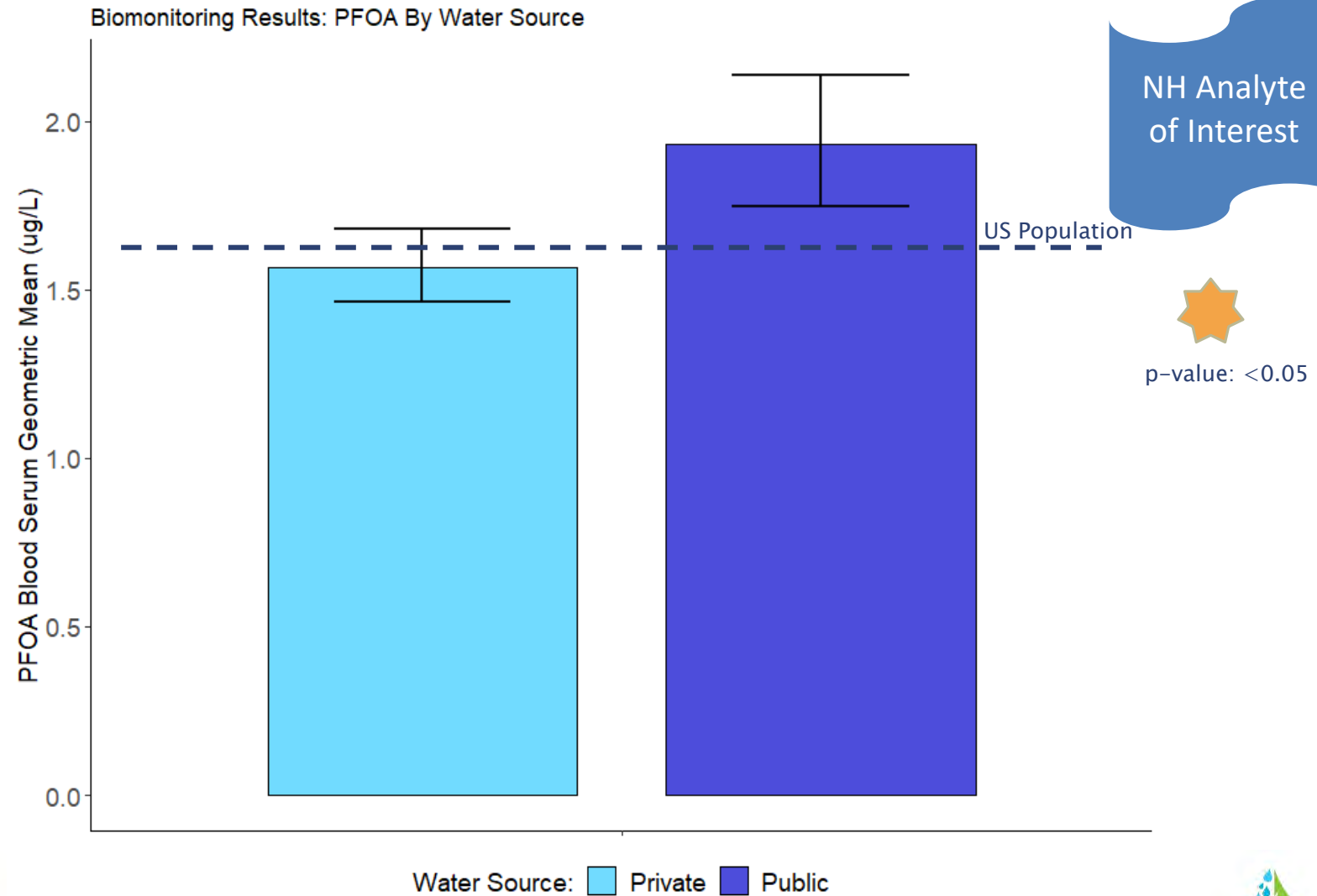
NH Analyte of Interest

Evaluation of Biomonitoring Results by Home Water Source: Serum PFHxS



NH Analyte of Interest

Evaluation of Biomonitoring Results by Home Water Source: Serum PFOA



Recommendations


- 
- Private well users
 - Test water per NHDES recommendations
 - Use NHDES ***Be Well Informed*** website to interpret results
 - Consider treatment
 - Contact treatment vendors – use your ***Be Well Informed*** report
 - Maintain your system and retest your water
 - Municipalities
 - Urge private well users to follow NHDES recommendations
 - Conduct community testing events
 - Require NHDES-recommended testing for Certificates of Occupancy

Table 1 NHDES Recommendations for Private Well Testing	
Private Well Users	"NH Well Water Test for Home Buyers"
Test every 3 to 5 years (except for bacteria and nitrate, which are recommended yearly)	Test during the inspection period as specified in contract
Arsenic Bacteria (Total Coliform and E. coli) Chloride Copper* Fluoride Hardness Iron Lead* Manganese Nitrate/Nitrite pH Radon** Sodium Uranium	
Other chemicals depending on circumstances***	

Costs at State Lab

- \$90 NHWWTHB (list at right)
- \$85 "Standard"
- \$105 "Standard" plus radon
- \$120 VOCs

*For current well users, NHDES recommends testing for stagnant lead and copper in addition to flushed lead and copper.

**Radon may be omitted for wells that do not reach into bedrock (for example, dug wells).

***Circumstances to be considered include nearby land uses, proximity of the well to a septic system leach field, the possibility of fuel or other chemical spills nearby, and the availability of resources to pay for testing. For more information, see NHDES' Fact Sheet, WD-DWGB-2-1 Suggested Water Quality Testing for Private Wells.

PFAS Private Well Recommendation

PFAS are in products that are used in domestic, commercial, institutional and industrial settings. PFAS have also been used to fight certain types of fires. PFAS have affected wells throughout New Hampshire but are more frequently detected at elevated levels in southern New Hampshire. Homeowners should strongly consider their testing their private wells for PFAS if they can afford to in addition to the standard analysis

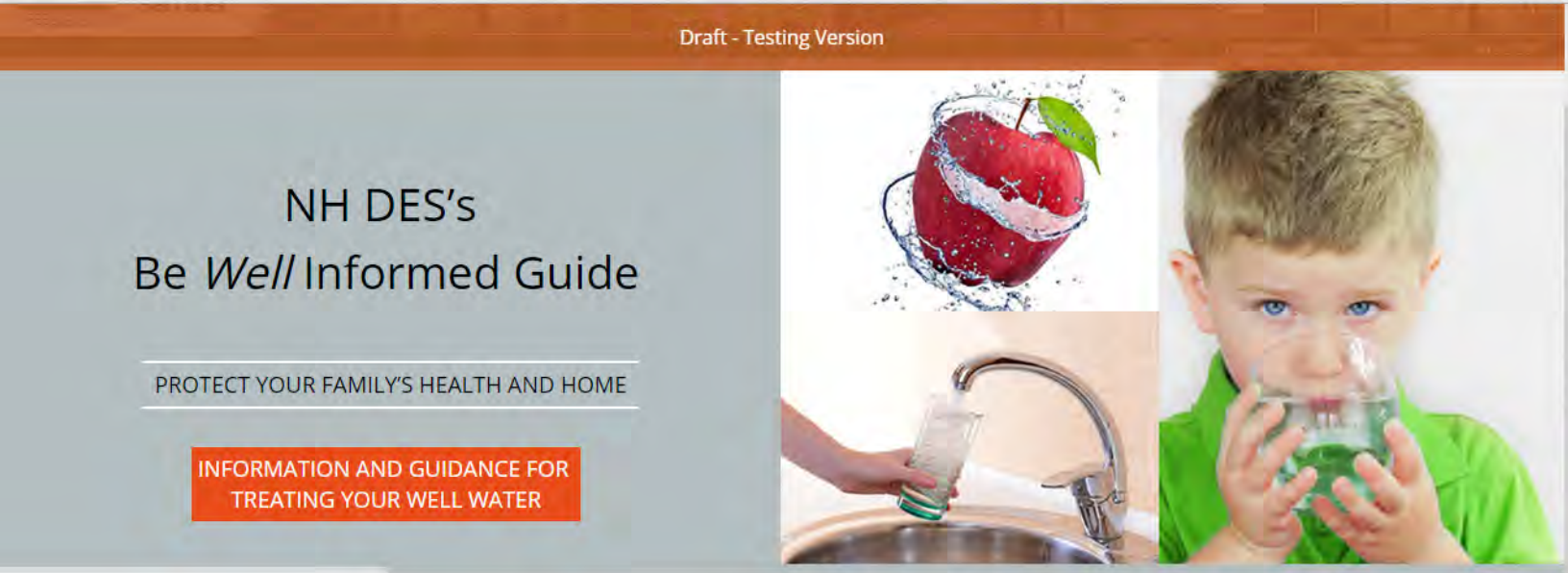
Table 2
Accredited Laboratories Providing Well Water Quality Testing Services
in New Hampshire and Neighboring States¹

LABORATORY NAME	TELEPHONE	ADDRESS	TOWN	STATE	WEBSITE
ABSOLUTE RESOURCE ASSOCIATES LLC	(603) 436-2001	124 HERITAGE AVENUE	PORTSMOUTH	NH	WWW.ABSOLUTERESOURCEASSOCIATES.COM
CHEMSERVE ENVIRONMENTAL	(603) 673-5440	317 ELM STREET	MILFORD	NH	WWW.CHEMSERVELAB.COM
CON-TEST ANALYTICAL LABORATORY	(413) 525-2332	39 SPRUCE STREET	EAST LONGMEADOW	MA	WWW.CONTESTLABS.COM
EAI ANALYTICAL LABS	(603) 357-2577	33 WHITTMORE FARM ROAD	SWANZEY	NH	WWW.EAI-LABS.COM
EASTERN ANALYTICAL INC.	(603) 228-0525	25 CHENELL DRIVE	CONCORD	NH	WWW.EAILABS.COM
ENDYNE INC	(603) 678-4891	56 ETNA ROAD	LEBANON	NH	WWW.ENDYNELABS.COM
ENDYNE INC	(802) 879-4333	160 JAMES BROWN DRIVE	WILLISTON	VT	WWW.ENDYNELABS.COM
GRANITE STATE ANALYTICAL SERVICES LLC	(603) 432-3044	22 MANCHESTER ROAD, UNIT 2	DERRY	NH	WWW.GRANITESTATEANALYTICAL.COM
NELSON ANALYTICAL LLC	(603) 622-0200	490 E INDUSTRIAL PARK DRIVE	MANCHESTER	NH	WWW.NELSONANALYTICAL.COM
NELSON ANALYTICAL LLC	(207) 467-3478	120 YORK STREET	KENNEBUNK	ME	WWW.NELSONANALYTICAL.COM
NEW ENGLAND RADON LTD	(603) 893-4260	11 INDUSTRIAL WAY, UNIT 3	SALEM	NH	WWW.NEWENGLANDRADON.COM
NH DHHS PUBLIC HEALTH LABORATORIES	(603) 271-3445	29 HAZEN DRIVE	CONCORD	NH	WWW.DHHS.NH.GOV/DPHS/LAB/WATER-LAB/INDEX.HTM
SEACOAST ANALYTICAL SERVICES	(603) 868-1457	ROUTE 125 & 72 PINKHAM ROAD	LEE	NH	WWW.SEACOASTANALYTICAL.COM

NHDES Be Well Informed Web Tool

- Interpretation of lab results
- Treatment guidance
- Risks to health and home appliances

Draft - Testing Version



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 **NH ELAP 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

Be Well Informed requires a lab report that the user must use to type in the results for one or a number of contaminants

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.

Invalid Entry – Please try again

NH Town or City * Anonymous

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 CaCO3		mg/L	pH		units
Iron (Fe)		mg/L	Sodium (Na)		mg/L

Bacteria

Total Coliform CFU/100 mL

or choose Present Absent

E. coli CFU/100 mL

or choose Present Absent

Radionuclides

Radon (Rn) pCi/L

Uranium (U) µg/L

Gross Alpha pCi/L

Submit **Reset**

Printable Web App 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

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

Step 1



Whole House Oxidizing
Filter System

OR

Whole House Cation
Exchange Water
Softener

Step 2



Whole House Acid
Neutralizer System

Step 3



Point-of-Use (POU)
Arsenic Adsorption
Media Filter System

OR

Point-of-Use (POU)
Reverse Osmosis (RO)
System

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, your water contains more than 0.1 mg/L of iron and manganese, which must be considered in your water treatment 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 an oxidizing agent to reduce the level of iron and manganese. This type of system will also reduce the level of arsenic in 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.

Recommendations

- Private well users
 - Test water per NHDES recommendations
 - Use NHDES ***Be Well Informed*** website to interpret results
 - Consider treatment
 - Contact treatment vendors – use your ***Be Well Informed*** report
 - Maintain your system and retest your water
- Municipalities
 - Urge private well users to follow NHDES recommendations
 - Conduct community testing events
 - Require NHDES-recommended testing for Certificates of Occupancy

Community Testing Events

Local coordinator handles logistics and outreach

NHDES and NHDHHS staff hold workshop – in-person or remote per town's preference

- **Overview of contaminants, recommendations**
- **Distribute test kits**

Participants take samples and bring samples and payment to collection point at specified time

Local coordinator (or NHDES staff in near future) bring samples to lab

NHDES and NHDHHS staff conduct follow-up workshop

For more information

On the web, search for “NHDES private well testing”

Contact: WellTest@des.nh.gov