ProVerde Environmental
Analytical PFAS Testing

Technical Guide to Well Water Mitigation Options for Massachusetts Private Well Households

You just got your lab report back and some things are over the suggested limit. Don't panic — almost every failed private well in Massachusetts can be fixed and made safe. Here's exactly what the failed items mean and the proven, most common fixes that local well companies install every day.

EPA Guidance on Well Water

The Environmental Protection Agency (EPA) provides guidance to ensure the safety and quality of drinking water from private wells. Conduct annual checkups and maintenance to ensure the well is functioning properly and remains free from contaminants.

Microbial Screening

Coliform Bacteria: Limit: Absence (0 detectable)

- Health Concerns: Coliforms are bacteria that indicate that other, potentially harmful bacteria may be present. Stomach bugs, serious risk if E. coli
- Possible Sources: Human and animal fecal waste
- Mitigation Choices: 1. Shock-chlorinate the well (one-time deep cleaning) 2. Install a whole-house UV light system with pre-filters. Approximate Installed cost: UV system $1,400 – $2,200 Shock chlorination $350 – $650

E.coli Bacteria: Limit: Absence (0 detectable)

- Health Concerns: E.coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes may cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.
- Possible Sources: Human and animal fecal waste
- Mitigation Choices: 1. Shock-chlorinate the well (one-time deep cleaning) 2. Install a whole-house UV light system with pre-filters. Approximate Installed cost: UV system $1,400 – $2,200 Shock chlorination $350 – $650

Heterotrophic plate count (HPC): Limit: 500 bacterial colonies per milliliter (CFU/mL)

- Health Concerns: HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.
- Possible Sources: HPC measures a range of bacteria that are naturally present in the environment

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Inorganic Anions

Chloride: Limit 250 mg/L

- Health Concerns:
  Can affect water taste and odor
- Mitigation Choices: Whole-house Reverse Osmosis (big expense) or under-sink RO just for drinking/cooking. Approximate Installed cost: Whole-house $6,000–$10,000 Under-sink $400–$900

Fluoride: Limit: 4 mg/L

- Health Concerns: Bone disease at very high levels (pain and tenderness of the bones); children may get mottled teeth
- Possible Sources: Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
- Mitigation Choices: Activated-alumina tanks or whole-house RO. Approximate Installed cost: $2,000 – $6,000

Nitrate: Limit: 10 mg/L

- Nitrate in drinking water can be responsible for a temporary blood disorder in infants called methemoglobinemia (blue baby syndrome). In infants less than six months old, a condition exists in their digestive systems which allows for the chemical reduction of nitrate to nitrite. The nitrite absorbs through the stomach and reacts with hemoglobin to form methemoglobin, which does not have the oxygen carrying capacity of hemoglobin. Thus, the oxygen deficiency in the infant's blood results in the "blue baby" syndrome. When the nitrate-contaminating source is removed, the effects are reversible. Since ingestion of water containing high nitrate concentrations can be fatal to infants and livestock, the U.S. EPA has established a level of 10 mg/L total nitrate (measured as nitrogen) as the Maximum Contaminant Level Goal (MCLG) and Maximum Contaminant Level (MCL) in drinking water. **Although extreme levels of nitrate can be associated with central nervous disorders in adults, it should be noted that nitrates and nitrites are rarely a problem in drinking water for humans older than six months of age.**
- Possible Sources: The primary inorganic nitrates which may contaminate drinking water are potassium nitrate and ammonium nitrate both of which are widely used as fertilizers. The principal sources of nitrate contamination in water are thus fertilizers, animal waste, and septic tank wastes. The water supplies most vulnerable to nitrate contamination are in agricultural areas and in well waters having a close or hydraulic relationship to septic tanks.
- Mitigation Choices: Nitrate-removal tank (looks like a water softener but uses special salt). Approximate Installed cost: $2,800 – $4,200

Nitrite: Limit: 1000 µg/L

- Health Concerns:
  Infants below the age of six months who drink water containing nitrite or nitrite in excess of

their MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome

- Possible Sources:
  Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
- Mitigation Choices: Nitrate-removal tank (looks like a water softener but uses special salt). Approximate Installed cost: $2,800 – $4,200

Hardness: Optimum Range: 50 mg/L to 200 mg/L *Considered to be Soft Water if below 50 mg/L, Hard Water if above 200 mg/L.*

- Health Concerns: Can affect water taste and odor. Very hard water causes scale on fixtures, dry skin, spotty dishes
- Additional Information: The EPA has not set a legal limit for water hardness, but it provides guidelines for secondary drinking water standards to help manage aesthetic issues like taste and scaling. Many water utilities aim to keep hardness levels low to avoid unpleasant effects, and homeowners often use water softeners to reduce hardness.
- Mitigation Choices: Traditional salt-based water softener. Approximate Installed cost: $1,500 – $2,600

Physical

pH Limit: 6.5 to 8.5

- Health Concerns: Can affect water taste and odor
- Other Concerns: Low pH (acidic water below 6.5) blue-green stains, pinhole leaks in pipes
- Mitigation Choices: Automatic calcite neutralizer tank . Approximate Installed cost: $1,200 – $2,000

Conductivity: Limit 1000 µS/cm

- The U.S. Environmental Protection Agency (EPA) recommends that drinking water conductivity should be less than 1000 µS/cm to ensure it is safe and not overly contaminated. Conductivity values outside this range may indicate potential water quality issues that require further investigation.

TDS (Total Dissolved Solids): Limit 500 ppm

- Total dissolved solids (TDS) are the amount of organic and inorganic materials, such as metals, minerals, salts, and ions, dissolved in a particular volume of water. TDS in water can come from just about anywhere, including natural water springs, chemicals used to treat the municipal water supply, runoff from roads and yards, and even from your home plumbing system. According to the EPA secondary drinking water regulations, 500 ppm is the recommended maximum amount of TDS for your drinking water. Any measurement higher than 1000 ppm is an

unsafe level of TDS, consider a reverse osmosis system to filter TDS If the level exceeds 2000 ppm, then a filtration system may be unable to properly filter TDS.

Metals

Arsenic: Limit 0.010 mg/L

- Health Concerns: Skin damage or problems with circulatory systems and may have increased risk of getting cancer. Test more often if detected or in areas with known Arsenic issues
- Potential Sources: Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes
- Mitigation Choices: Two special filter tanks filled with "arsenic-eating" media (MetSorb or Bayoxide E33) installed in your basement or well house. Approximate Installed cost (2025 prices): $2,800 – $4,500

Cadmium: Limit 0.005 mg/L

- Health Concerns: Kidney damage
- Potential Sources: Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
- Mitigation Choices: Under-sink Reverse Osmosis (RO) system that is NSF-certified to remove heavy metals. Approximate Installed cost: $400 – $900

Copper: Limit: 1.3 mg/L

- Health Concerns: Short-term exposure: Gastrointestinal distress. Long- term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level
- Other Concerns: Green stains, bitter taste
- Potential Sources: Corrosion of household plumbing systems; erosion of natural deposits
- Mitigation Choices: Traditional salt-based water softener. Approximate Installed cost: $1,500 – $2,600

Iron: Limit: 0.3 mg/L

- Health Concerns: Can affect water taste and odor
- Other Concerns: Orange/black stains, metallic taste
- Mitigation Choices: Air-injection iron filter (backwashes itself automatically). Approximate Installed cost: $1,800 – $3,200

Lead: Limit: 0.015 mg/L

- Health Concerns: Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure
- Possible Sources: Corrosion of household plumbing systems; erosion of natural deposits

- Mitigation Choices: Under-sink Reverse Osmosis (RO) system that is NSF-certified to remove heavy metals. Approximate Installed cost: $400 – $900

Magnesium: Limits: No MCL values, typical concentrations range from 1 to 100 mg/L

- Health Concerns: EPA provides no MCL, as it is generally considered non-toxic and even beneficial in moderate amounts, often contributing to water hardness, though high levels can affect taste or cause scaling in pipes.
- Potential Sources:
  Magnesium in well water originates from natural rock and soil dissolution or human sources like fertilizers, road salts, and industrial waste, varying by local geology, water hardness, and pH.

Manganese: Limit: 0.3 mg/L

- Health Concerns: High manganese can cause neurological health risks (especially in infants) above 0.3 mg/L, and aesthetic issues (bitter taste, black staining) above 0.05 mg/L.
- Possible Sources: Common sources include natural rock/soil leaching and human activities like agricultural runoff or industrial waste.
- Mitigation Choices: Air-injection iron filter (backwashes itself automatically). Approximate Installed cost: $1,800 – $3,200

Mercury: Limit 0.002 mg/L

- Health Concerns: Kidney damage
- Potential Sources: Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
- Mitigation Choices: Under-sink Reverse Osmosis (RO) system that is NSF-certified to remove heavy metals. Approximate Installed cost: $400 – $900

Sodium: Limit for those on low sodium intake diet 20mg/L. For those on a normal diet the suggested acceptable range is 30-60 mg/L.

- Health Concerns: For those on low-sodium intake diets (<500mg/day) the limit is 20mg/L and can affect health (e.g., hypertension, kidney issues).
- Other Concerns: above 30-60 mg/L, may cause salty taste, plumbing corrosion, and plant damage. Domestic water softeners can increase sodium levels to more than 300 mg/L in drinking water (NAS 1977).
- Possible Sources: Natural mineral leaching from rocks and soils; human sources like road salt runoff, leaking septic systems, fertilizers, industrial waste, sewage, and water softener backwash.
- Mitigation Choices: Whole-house Reverse Osmosis (big expense) or under-sink RO just for drinking/cooking. Approximate Installed cost: Whole-house $6,000–$10,000 Under-sink $400–$900

Common “Package” Systems Installed in MA

Your Main Problems	Typical Complete System Installed Together	Total Cost Range
Iron + Manganese + Hardness + Low pH	Calcite neutralizer → Air-injection iron filter → Water softener	$4,500 – $7,500
Arsenic only	Two arsenic media tanks in series	$2,800 – $4,500
Bacteria only	Shock chlorination + whole-house UV light with pre-filters	$2,000 – $3,000
Nitrate only	Nitrate-removal tank	$2,800 – $4,200
Lead + Fluoride + Nuisance stuff	Whole-house softener + under-sink RO for drinking	$2,200 – $3,800
Almost everything failed (metals + nitrate + bacteria)	Big system: oxidizing filter → softener → arsenic tanks → UV → under-sink RO	$9,000 – $14,000

Local Water Treatment Companies in Massachusetts

Here are some local established companies specializing in private well testing, filtration, and treatment. These are suitable for residential wells (not big commercial firms). Call 2–3 for free quotes and share your lab report—they'll customize a plan. Most offer MassDEP-certified installs for UV and arsenic systems.

Company Name	Service Area	Specialties (Wells & Treatment)	Contact Info / Website	Background
Friot's Water Treatment Co.	Eastern MA & Southern NH	Well pump service, arsenic/iron filtration, UV systems, full custom installs	friots.com Phone: (978) 466-6400	50+ years local; excellent reviews for honest service and well-specific solutions
Skillings & Sons, LLC	Central/Southern MA & NH	Well drilling, filtration, geothermal, bacteria/iron treatment	skillingsandsons.com Phone: (603) 528-4900	50+ years family-owned; 75+ experts in MA wells; featured on This Old House
Clear Water Pump & Well Service	Eastern MA & RI	Whole-house filtration, RO, UV purification, well inspections	cwpsinc.com Phone: (508) 295-1212	15+ years; 11,000+ customers; top Google reviews for quick, reliable well fixes
SafeWell	Statewide MA, RI, Southern NH	Well testing, RO systems, arsenic/nitrate removal, bacteria treatment	safewell.us Phone: (978) 206-6326	8+ years; scientists & certified techs; custom for bedrock/gravel wells
H2O Care	Eastern MA, NH, ME, RI	Water softeners, filtration, well/municipal testing, UV	h2ocare.com Phone: (800) 860-2450	Since 1989; thousands of installs; guarantees satisfaction

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Northeast Water Wells, Inc.	Eastern/Central MA	Custom filtration/softeners, iron/manganese, hardness systems	wellguy.com Phone: (978) 466-5575	Well drilling + treatment focus; tailored to MA water issues
High Purity Water, Inc.	MetroWest MA (e.g., Stow, Grafton)	Arsenic RO/filtration, well service, emergency repairs	gohighpuritywater.com Phone: (508) 839-9300	Local experts in high-arsenic areas; factory-authorized service

Pro Tip: Search WellOwner.org for more near your town (wellowner.org/find-a-contractor/Massachusetts). Always verify they're licensed for wells (not just plumbing).

Next Steps – What to Do This Week

1. **Call 2–3 local water treatment companies** from the list above that specialize in private wells (not plumbers who "also do water"). Ask: "Can you look at my lab report and give me a free written quote for a whole-house system that will make every parameter pass?"
2. Make sure they are **MassDEP-approved** to install UV systems and have experience with the exact problem on your report (especially arsenic, nitrate, or bacteria).
3. Get the system quotes in writing and ask for references or photos of similar jobs.
4. If bacteria showed up — start using bottled water or boil water for drinking/cooking until the UV system is running.

You've already done the hardest part — testing the water. Fixing it is straightforward, and thousands of Massachusetts families drink clean well water every day with these exact systems.