Private Wells:

A Complete Guide to Protecting Your Family's Water

NOVA SCOTIA

Private Wells:

A Complete Guide to Protecting Your Family's Water

This document outlines the key steps private well owners can take to test, treat, and maintain their water well systems to ensure clean, safe drinking water. The following six detailed sections provide the essential actions that every well owner should take. The early sections focus on bacterial and chemical water quality and the treatment options available. The final section addresses water quantity, helping you understand your household's daily water needs and how much water your well can reliably supply.

Contents

Section 1	Test Your Well Water: Is It Safe to Drink?	3
Section 2	Bacterial Quality	12
Section 3	Chemical Quality	18
Section 4	Water Treatment Options	27
Section 5	Maintaining Your Water Treatment	35
Section 6	Water Quantity and Well Yield	41

Table 1	Bacterial Treatment Technologies	17
Table 2	Recommended chemical parameters to test	23
Table 3	Common water quality problems	24
Table 4	Treatment System Types and Their Considerations	31
Table 5	Testing and Inspection Log	39
Table 6	Treatment System Maintenance Requirements	39
Table 7	Drilled wells – Volume of Water	47
Table 8	Dug wells – Volume of Water	47
Figure 1	Drilled wells with various yields and depths	45

Publication date: March 2026

Section 1. Test Your Well Water: Is It Safe to Drink?

What You Need to Do

When your home relies on a private well, taking care of your drinking water is one of the most important things you can do for your family's health. Even when water tastes fresh and looks perfectly clear, it may still contain bacteria or chemicals that you cannot see or smell. Regular testing gives you confidence that your water remains safe, and it helps you respond early if something changes. This section guides you through what to do, when to do it, and how to ensure your well water stays safe.

Test Your Water at Regular Intervals

You should become familiar with a simple routine for testing your well water. This routine helps you detect problems early and prevents small issues from becoming major concerns.

Each year, you should arrange for bacterial testing of your well water. This test looks for *E. coli* and total coliform bacteria, which are clear signals of contamination. Annual testing is recommended at a minimum because bacterial conditions can change from season to season or after weather events, even if your water appears clean and unchanged.

In addition to bacteria, you should test your water for chemical contaminants at least every five years. Chemicals such as arsenic, manganese, uranium, sodium, or nitrate can appear naturally in Nova Scotia groundwater, and their levels may shift slowly over time. Some chemicals may pose health risks at low concentrations, while others may simply create taste, colour, or staining problems. A five-year cycle gives you a clear picture of how your water chemistry is behaving over the long term.

Test Sooner When Something Changes

Aside from your regular schedule, there are moments when you should test again right away. These moments are important, because changes in appearance, taste, or smell often mean something in your well or the surrounding land has shifted.

You should consider immediate retesting when:

- Your water becomes cloudy, coloured, or develops particles
- You smell unusual odours such as sulphur or a musty scent
- The taste changes in a noticeable way
- You see new staining on fixtures or laundry
- There has been flooding, heavy rain, or surface water pooling around your well
- There has been nearby construction, blasting, or significant landscaping
- Work has been done recently on your pump or plumbing system

These events can disturb your water source or allow contaminants to enter your system. Testing promptly helps you understand what has changed and what steps to take next.

Use Accredited Laboratories and Follow Their Instructions Carefully

To make sure your test results are accurate, always use an accredited water testing laboratory. These labs provide sample bottles and instructions designed to prevent accidental contamination during sample collection. Following these instructions closely is essential. If lab instructions are missing or unclear, the province provides online sampling procedure documents.

- Choose a clean tap and remove any screens or aerators.
- Disinfect the end of the tap with household bleach or rubbing alcohol to eliminate any bacteria living on the faucet.
- Let cold water run for at least 5 minutes or until the water runs noticeably colder before sampling.
- Open the sample bottle carefully, making sure not to touch the inside of the lid or bottle.
- Fill to the marked line without rinsing beforehand and close the lid securely.
- Label the bottle as instructed and return it promptly—within 24 hours and ideally on the same day—keeping it cool on the way.

Know When Your Water Is Safe or Unsafe

Your bacterial test results will show whether your water is safe to drink. Results that say "absent," "0 CFU/100 mL," "<1 CFU/100 mL," or "non detect (ND)" mean no bacteria were found, and the water is considered safe. Any result showing bacteria present or showing any amount higher than zero means the water is not safe for drinking.

Chemical test results compare your water to health-based limits called Maximum Acceptable Concentrations (MACs). If any chemical exceeds its MAC, your water may pose a health risk. It is important to treat the water as unsafe until you confirm the result with another test and decide how to address the issue. Some chemicals with aesthetic guidelines (colour, taste, odour) do not pose health risks but may still indicate that treatment is helpful.

What to Do If Your Water Is Unsafe

If your results show bacteria or chemicals at unsafe levels, you should switch immediately to a safe water source. The simplest way to do this is to use bottled water. Boiling water for at least one full minute at a rolling boil will make it safe only when bacteria are present. Boiling will not remove chemicals such as metals (for example, arsenic or uranium) or other chemical contaminants. For chemical problems, bottled water is recommended.

Use boiled or bottled water for:

- Drinking
- Making infant formula or food
- Washing fruits and vegetables
- Cooking
- Making ice
- Brushing teeth

Most people can continue to bathe or shower with the water, provided they avoid swallowing it. Infants and toddlers should be sponge bathed until the problem is resolved.

Because contamination can sometimes result from sampling error or temporary conditions, it is important to repeat the test before taking expensive or long-term actions. Continue using boiled or bottled water until your repeat test shows the water is safe again.

Investigate the Cause of Unsafe Results

Unsafe results call for a closer look at your well and plumbing. If bacteria are found, start outside by examining your wellhead, well cap, and the land around your well. Look for anything unusual: a loose or cracked cap, cracked casing, water pooling after rain, or signs of recent disturbance. Consider nearby activities, such as livestock, septic system issues, or yard work, that may allow bacteria to enter the well.

If chemical results exceed safe levels, you may need to investigate geological causes (such as natural arsenic in bedrock) or human causes (nearby spills, industrial activity, or changes in the landscape).

Depending on what you find, you may need to disinfect the well, repair or improve well components, or speak with a certified well contractor or water treatment specialist.

Keep a Simple Testing and Inspection Log

Having a written record makes it much easier to keep track of your well's history. A simple sheet or notebook is enough. Record:

- The date of each test
- What was tested (bacteria or chemicals)
- The results
- Any changes you noticed in your water
- Any flooding, repair work, or major land activities near your home
- Any treatment installed or maintenance completed

Keeping track in this way helps you spot patterns and gives professionals useful background information if you need help.

More About This Topic

Testing your well water is essential because groundwater changes over time and can be affected by weather, soil, land use, and the condition of your well. You cannot rely on sight, smell, or taste to know whether your water is safe. Clear and pleasant-tasting water can still contain harmful bacteria or chemicals. Testing is the only reliable way to know what you are drinking.

Why Bacteria Testing Matters

Bacteria can enter a well suddenly, especially after heavy rain or flooding, or through damaged well components. *E. coli* is found in the intestines of humans and animals, so its presence means that fecal contamination has entered your water source. Total coliforms occur naturally in soil and surface water, and their presence indicates that outside water, or bacterial growth inside the well, is reaching your tap. If your test shows either *E. coli* or total coliforms are present, the water is not safe to drink, even if it looks clear. Regular testing helps you catch these problems early.

Why Chemical Testing Matters

Many of the chemicals tested in well water come from natural minerals in the ground. For example, arsenic, manganese, uranium, and iron are common in Nova Scotia bedrock. Over time, these elements can dissolve into groundwater. Some of them can affect your health when levels rise above specific limits. Others can cause staining, taste issues, or corrosion, but may not be harmful to health. Because these changes happen slowly, a five-year testing cycle is recommended for most households. More frequent testing may be needed if you notice changes or live near activities that may affect groundwater.

Why Proper Sampling Is Essential

When sampling is done incorrectly, such as touching the inside of the bottle, failing to disinfect the tap, or letting the bottle sit too long before returning it to the lab, bacteria from the tap or environment can contaminate the sample. This can lead to misleading results that do not reflect the true condition of your well. Taking a few extra moments to follow the lab's instructions helps ensure that your results are trustworthy.

Why You Should Confirm Unsafe Results

A positive bacteria result, or a chemical result above the safe limit, can sometimes be caused by temporary conditions or errors during sampling. Confirming the result with a second test protects you from making unnecessary decisions, such as installing treatment systems or making major well repairs. Retesting allows you to proceed with confidence and make informed choices about what comes next.

Why It Helps to Keep a Log

Wells have long lives, and their performance can change over time. Floods, droughts, wildfires, construction, and even seasonal weather patterns can affect water quality. A simple log helps you keep track of trends and identify when something is unusual. It also gives professionals a clear picture of what has been happening, helping them provide better advice.

Reference Information

Required Testing Frequencies

BACTERIA TESTING

- You should test your well for *E. coli* and total coliform bacteria at least once every year.
- Additional bacterial testing is recommended whenever water changes in taste, smell, colour, or clarity, or after flooding, construction, or system repairs.

CHEMICAL TESTING

- You should test for chemical quality at least every 5 years.
- Chemicals that commonly occur in Nova Scotia well water include: arsenic, uranium, manganese, fluoride, lead, nitrate/nitrite, sodium, chloride, hardness, and others listed in Table 2.

Bacteria Definitions and Safe Results

SAFE BACTERIA RESULTS

The following common lab terms mean your well water is considered safe from bacteria:

- "Absent"
- "0 CFU/100 mL"
- "<1 CFU/100 mL"
- "Non-detect (ND)"

These results all indicate that no harmful bacteria were found in the sample.

Any presence of bacteria is evidence of unsafe water. *E. coli* indicates fecal contamination from human or animal waste. Total coliforms indicate surface water entry, biofilm growth, or structural well vulnerabilities.

Chemical Categories and Guideline Types

HEALTH-BASED GUIDELINES — MAC

A Maximum Acceptable Concentration (MAC) is a scientifically established limit for substances that may affect human health. If a result is above a MAC, the water may cause illness, and you should treat it as unsafe until the problem is corrected. Examples include:

- Arsenic
- Lead
- Manganese (health-based guideline)
- Uranium
- Nitrate/nitrite
- Fluoride
- Selenium

AESTHETIC GUIDELINES — AO

An Aesthetic Objective (AO) is a guideline for substances that affect taste, odour, or colour, but not health, at typical levels. Examples include:

- Iron
- Chloride
- Colour
- Sodium
- Total dissolved solids

Aesthetic issues can still interfere with treatment systems or cause staining, corrosion, mineral buildup, and household inconvenience.

INDICATOR PARAMETERS

Indicators do not directly affect safety but can show underlying problems. Examples:

- pH
- Conductivity
- Turbidity
- Total organic carbon
- Alkalinity

These help diagnose corrosion risks, shallow groundwater influence, or treatment performance issues.

Sampling Requirements

To avoid contamination and collect samples properly:

- Use only sample bottles provided by an accredited laboratory.
- Choose a clean tap and remove any screens or aerators.
- Disinfect the end of the tap with household bleach or rubbing alcohol to eliminate any bacteria living on the faucet.
- Let cold water run for at least 5 minutes or until the water runs noticeably colder before sampling.
- Open the sample bottle carefully, making sure not to touch the inside of the lid or bottle.
- Fill to the marked line without rinsing beforehand and close the lid securely.
- Label the bottle as instructed and return it promptly—within 24 hours and ideally on the same day—keeping it cool on the way.

If lab instructions are missing or unclear, the province provides online sampling procedure documents.

Causes of Unsafe Water

BACTERIA

Unsafe bacteria results may be caused by:

- Sewage contamination from malfunctioning septic systems
- Animal waste infiltration (pets, livestock, wildlife)
- Surface water entering your well through cracks or poor grading
- Insect entry through unsealed well caps
- Plumbing or pump work that introduced contamination
- Biofilm formation inside the well or pipes
- Naturally shallow groundwater with microbial presence

CHEMICALS

Chemical exceeding safe limits may come from:

- Natural geology (e.g., arsenic, uranium)
- Corrosion of pipes or fixtures (e.g., lead, copper)
- Agricultural runoff (nitrate/nitrite)
- Road salt (sodium, chloride)
- Industrial spills or fuel contamination
- Organic chemicals (VOCs) from human activity

Provincial Tools Supporting Testing

Nova Scotia Environment and Climate Change provides:

- A list of accredited water testing laboratories in the province
- Step-by-step instructions for bacteria sampling
- Guidance for chemical sampling
- The online Drinking Water Interpretation Tool (DWIT) for comparing test results to Health Canada guidelines
- Parameter-specific fact sheets ("Drop on Water" series)

Section 2. Bacterial Quality

What You Need to Do

When your water comes from a private well, it can be easy to assume it is safe as long as it looks clear and tastes normal. But harmful bacteria can enter a well long before you see any visual change. That is why testing for *E. coli* and total coliform bacteria is an essential step in caring for your family's water. This section helps you understand how to test, what the results mean, and the actions you should take if bacteria are present.

Test Your Water for Bacteria at Least Once Each Year

It is important to test for bacteria every year, even if your water seems perfectly fine. Bacteria are too small to see, and contamination can happen without warning. Your well may be affected by the changing seasons, surface water, or work done on your well and water system. Annual testing helps you confirm that your water is free of harmful organisms such as *E. coli* and total coliform bacteria.

In addition to yearly testing, you should test again any time something unusual happens with your water. If the water becomes cloudy or develops a new smell, or if you notice changes after heavy rainfall, flooding, or repairs, it is wise to collect another sample. These moments often signal that surface water has entered your well or that bacteria have found a way inside.

Collect Samples Carefully to Get Accurate Results

Collecting a bacteria sample takes only a few minutes, but how you do it makes all the difference. Determine if you need to sample untreated (raw) water, treated water or both. Before you begin, make sure you have sample bottles supplied by an accredited lab, because these bottles are sterile and prepared for accurate testing.

To collect your bacterial sample:

- Choose a clean tap and remove any screens or aerators.
- Disinfect the end of the tap with household bleach or rubbing alcohol to eliminate any bacteria living on the faucet.
- Let cold water run for at least 5 minutes or until the water runs noticeably colder before sampling.
- Open the sample bottle carefully, making sure not to touch the inside of the lid or bottle.

- Fill to the marked line without rinsing beforehand and close the lid securely.
- Label the bottle as instructed and return it promptly—within 24 hours and ideally on the same day—keeping it cool on the way.

These steps help ensure the bacteria detected in the sample are truly from your well, not from your tap or hands.

Know What Safe and Unsafe Results Look Like

Bacteria test results may come in different formats, but they all tell you the same essential information—whether your water is safe to drink.

Your water is safe when the results show that bacteria are not present in the water. Typical sample results showing no bacteria can look like:

- "Absent"
- "0 CFU/100 mL"
- "<1 CFU/100 mL"
- "Non-detect (ND)"

Your water is unsafe to drink when:

- *E. coli* is present, or
- Total coliforms are present, or
- Any number greater than 0 CFU/100 mL appears in the result

If bacteria are found in any amount, your water must be treated as unsafe, even if it looks clear and smells fine.

Take Immediate Action If Your Water Is Unsafe

If your results show that bacteria are present, switch immediately to a safe water source. This means using bottled water or water that has been boiled for at least one full minute before using it for drinking, cooking, washing fruits and vegetables, brushing teeth, making infant formula, or preparing ice.

While waiting for the issue to be resolved, it is still safe for most people to use tap water for washing and bathing, as long as they take care not to swallow any. Young children should be sponge bathed for safety.

Because sampling errors sometimes occur, or contamination may fluctuate, you should repeat the test before making big decisions. Continue using boiled or bottled water until you receive a safe result.

Look for Causes of Contamination

When bacteria are found, it helps to take some time to look at what could be causing the issue. Some common causes include:

- A loose or cracked well cap
- Surface water pooling around the well
- Insect entry
- Work recently done on your well, pump, or plumbing
- Septic system problems
- Animal activity or manure close to the well

You may need to disinfect the well and plumbing system by hiring a professional or using approved procedures from the province. Well disinfection can temporarily remove bacteria, but if the underlying cause is not fixed, such as poor well sealing or surface water entry, the problem may return. In these cases, a certified well contractor can help identify and address the root cause.

If bacteria continue to show up in repeat tests, you may need to consider a treatment system such as UV disinfection or chlorination. These systems require clear water and regular maintenance, but they can provide reliable long-term protection. Treatment options that address persistent bacterial issues are summarized in Table 1.

More About This Topic

Understanding the role of bacteria in your well water helps you see why regular testing and quick action when problems arise are so important. Unlike physical changes in water, such as cloudiness, colour, or taste, bacteria cannot be seen with the naked eye. A glass of contaminated water may appear just as clear as a safe one, which is why laboratory testing is essential.

Why Bacteria in Well Water Are Dangerous

E. COLI

E. coli bacteria come specifically from the intestines of humans and warm-blooded animals. When *E. coli* is found in your water, it tells you that waste—either human or animal—has entered the well. This can happen through flooding, surface-water drainage, septic-system malfunction, or damage to the well casing or cap. Because *E. coli* can make people sick, especially young children, older adults, and people with weakened immune systems, it is treated as a serious contamination event.

TOTAL COLIFORMS

Total coliforms come from soil, vegetation, insects, and surface water. They serve as "warning bacteria," signalling that your well is open to outside contamination. When total coliforms are present, the water is unsafe—even if *E. coli* is absent—because the well may allow surface water to enter, or bacteria may be growing inside the well or plumbing. Where total coliforms can enter, harmful bacteria such as *E. coli* may enter later.

Why Proper Sampling Matters

A surprising number of unsafe results come from improper sampling. If you touch the inside of the bottle, fail to disinfect the tap, or return the sample too late or too warm, outside bacteria may contaminate the sample. Proper sampling, storage, and transport to an accredited lab ensure the results you get represent the true condition of your well and that you make decisions based on accurate information.

Why a Second Test Helps You Make Informed Decisions

Water quality can change over time or fluctuate based on weather and groundwater conditions. A single contaminated sample may not always reflect an ongoing problem. Retesting helps confirm whether contamination is persistent and prevents you from investing in unnecessary treatment or repairs based on a single result. Confirming results before making changes also helps you protect your well over the long term.

Why Treatment or Well Repair May Be Needed

If repeated tests show bacteria, the issue may be structural. Surface water may be entering the well, the casing may be cracked, or the well cap may be insecure. Sometimes the well is simply too shallow and draws from groundwater that naturally contains bacteria. In these cases, well repair, construction improvements, or even drilling a deeper well may be needed. Treatment systems such as UV disinfection or chlorination can also provide reliable protection if installed and maintained properly. Treatment options that address persistent bacterial issues are summarized in Table 1.

Reference information

Bacteria Types and Their Meaning

E. COLI

- Found only in the intestines of humans and warm-blooded animals
- Indicates sewage or fecal contamination
- Water is unsafe even if it looks clear

TOTAL COLIFORMS

- Found naturally in soil, plants, insects, and surface water
- Suggests the well is not properly sealed or is vulnerable to contamination
- Indicates increased risk that *E. coli* may enter in the future

Safe Bacterial Result Format Examples

- "Absent"
- "0 CFU/100 mL"
- "<1 CFU/100 mL"
- "Non-detect (ND)"

Unsafe Bacterial Result Format Examples

- "Present"
- A numeric value above 0 CFU/100 mL

Bacterial Sampling Procedures

Bacterial sampling must follow accredited laboratory or provincial procedures, including those available at:

- Microbiological sampling procedure PDF
- Provincial water testing website
- Laboratory supplied instructions

Actions for Unsafe Results

If bacteria are present:

- Boil water for at least 1 minute
- Consider well disinfection using a hired professional or provincial procedures
- Evaluate well construction (casing, seals, drainage)
- Consider treatment options:
  - UV (NSF 55 Class A)
  - Chlorination
  - Distillation (point-of-use / single tap)

Table 1 Bacterial Treatment Technologies

TREATMENT TECHNOLOGY	CONSIDERATIONS
Ultraviolet Light (UV	• Effective for whole-house disinfection • Requires clear water (low turbidity and colour) • Needs regular maintenance
Chlorination	• Point-of-entry disinfection • Requires regular monitoring and maintenance
Distillation	• Point-of-use • Slow production, may require storage • Not recommended if volatile organic compounds (VOCs) are present

Section 3. Chemical Quality

What You Need to Do

What to test and when

When your water comes from a private well, chemical testing helps you understand what is dissolved in your water and whether any substances are present at levels that might affect your health or your plumbing and appliances. Even if your water looks clear and tastes fine, it can still contain chemicals that you cannot taste, smell, or see.

What These Chemical Terms Mean

METALS: Dissolve from natural minerals in soil and rock into well water. Some dissolved metals can affect health at low levels; others may cause colour, taste, or staining.

NITRATE / NITRITE: These can come from things like fertilizer or nearby septic systems. High amounts are not good for infants, so testing is important.

pH: Shows if water is more acidic or more basic. Low pH can slowly wear away pipes and cause metals to get into the water.

HARDNESS: Means the water has more calcium and magnesium. It is not harmful, but it can leave white marks, make soap less effective, and cause scale in kettles or hot water tanks. In NS, iron and manganese often are considered as "hardness" as they act similar.

TURBIDITY: How clear or cloudy the water is, usually caused by sediment. Cloudiness can make it harder for treatment systems to work properly.

VOCS (VOLATILE ORGANIC COMPOUNDS): Hazardous chemicals that can come from fuel spills, paint products, or old dump sites. Many VOC's may affect drinking water health at low levels. They can also move into the air easily and may be breathed in while showering causes potential health issues.

PESTICIDES: Chemicals used to control insects or weeds on farms, lawns, or gardens. These can sometimes reach groundwater.

You should test your well water for chemical quality at least every five years. This testing should include:

- Metals such as arsenic, lead, manganese, uranium, aluminum, copper, and others
- Nitrate and nitrite
- Salts and minerals such as sodium, chloride, sulphate, hardness, and total dissolved solids
- Water characteristics such as pH, turbidity (cloudiness), conductivity, colour

Recommended parameters and guideline types are outlined in Table 2.

In addition to this five-year schedule, you should test sooner if:

- You see new staining (red, orange, black, or blue-green) on fixtures or laundry
- Your water develops a strong or unusual taste or odour
- Water becomes cloudy, or sediment appears
- There has been nearby construction, blasting, or land disturbance
- You suspect fuel spills, pesticide use, or other contaminants in the area
- You have installed or changed a treatment system and need to check if it is working

If cost is a concern, ask the lab about a standard chemical package. These packages usually test for a range of recommended parameters at a lower cost than ordering each test separately.

How to collect a chemical sample

Chemical tests are only useful if the sample truly represents your water. Determine if you need to sample untreated (raw) water, treated water or both. To avoid contamination or misleading results, you should always use the bottles and instructions provided by an accredited laboratory.

- Use only sample bottles provided by an accredited laboratory
- Choose a clean tap and remove any screens or aerators.
- Disinfect the end of the tap with household bleach or rubbing alcohol to eliminate any bacteria living on the faucet.
- Let cold water run for at least 5 minutes or until the water runs noticeably colder before sampling.
- Open the sample bottle carefully, making sure not to touch the inside of the lid or bottle.

- Fill to the marked line without rinsing beforehand and close the lid securely.
- Label the bottle as instructed and return it promptly—within 24 hours and ideally on the same day—keeping it cool on the way.
- Label the sample as instructed and keep it cool until you deliver it to the lab

If instructions are missing or unclear, you can contact the lab or refer to the chemical sampling guidance from Nova Scotia Environment and Climate Change.

How to read your chemical results

Your chemical test report will list:

- The measured level of each substance in your water
- The corresponding MAC (Maximum Acceptable Concentration) if the parameter has a health-based limit
- The corresponding AO (Aesthetic Objective) if the parameter has a taste/colour guideline

To keep things simple:

- Think of a MAC as a health limit. If your result is above this level, your water may not be safe to drink, especially over time.
- Think of an AO as a taste/colour guideline. If your result is above this level, the water may still be safe, but could taste, smell, or look unpleasant, or cause staining or build-up.

Some laboratories will highlight which parameters exceed guidelines. You can also use our Drinking Water Interpretation Tool to compare your results and learn more about each parameter in our Drop on Water series. For examples of common issues and their effects, refer to Table 3.

What to do if a chemical result is high

If a chemical result is above a health limit (MAC):

1. Re-test that parameter to confirm the result
2. While waiting for confirmation, consider using bottled water or a known safe water source for drinking, cooking, and making infant formula
3. If the second test confirms the result is still above the MAC, you should:
    - Install appropriate treatment to reduce that chemical, or
    - Use another safe source of drinking water
4. Seek advice from a water treatment specialist and/or consult the reliable information for that specific parameter

If a chemical is above a taste/colour guideline (AO) or causes aesthetic problems:

- Your water may still be safe to drink, but you may choose treatment to:
  - Improve taste, smell, or appearance
  - Prevent staining of fixtures, laundry, or plumbing
  - Protect appliances and treatment systems from corrosion or mineral scale buildup

Treatment decisions can be complex. If cost is a concern, you may decide to focus on treating water at one tap (for drinking and cooking) rather than the entire house, depending on the chemical and the associated health guidance. For examples of common issues and their effects, refer to Table 3.

When and how to seek help

If your chemical results exceed health limits, or you are unsure how to interpret them, you may need help from:

- An accredited laboratory, to clarify the report and suggest follow-up tests
- A water treatment professional, to recommend treatment options
- A certified well contractor or groundwater professional, if you suspect contamination from land use, well construction, or geological conditions

More About This Topic

Chemical testing is important because groundwater always contains dissolved substances from the soil and rock it moves through. In Nova Scotia, some of these substances occur naturally at levels that can affect health or interfere with household water use. Others may come from human activity, such as farming, septic systems, or fuel spills. You cannot see many of these chemicals, and water that looks completely clear can still have levels of concern.

Some chemicals, such as arsenic, uranium, manganese, nitrate/nitrite, lead, and fluoride, have health-based guidelines. Long-term exposure to these above the maximum acceptable concentration (MAC) can contribute to health problems, including certain cancers, neurological effects, or problems in infants. For example, nitrate/nitrite at high levels can cause blue baby syndrome in formula-fed infants.

Others, like iron, chloride, hardness, and total dissolved solids, mainly affect how the water looks, tastes, or smells. They can stain fixtures, leave scale in kettles and hot water tanks, or cause corrosion in pipes. While these may not harm your health directly, they can make water less pleasant to use and may reduce the life of appliances. These chemicals typically have levels, known as aesthetic objectives (AO), where they begin to affect the taste, odour, or colour of your water.

The MAC and AO concepts help you distinguish between these different types of concern:

- MAC (health limit): A level above which health effects are possible, especially with long-term use
- AO (taste/colour guideline): A level above which the water may be unpleasant or problematic for household uses, but not necessarily harmful to health
- It is possible for a single chemical, such as manganese, to have an AO level and a separate MAC level

Indicator parameters like pH, hardness, conductivity, total organic carbon, and turbidity help you understand how your water might behave in your plumbing and treatment systems. For example, low pH (acidic water) can cause copper and lead to enter the water (leach) from pipes, while high turbidity (cloudiness) can interfere with some treatment methods.

Retesting whenever a MAC is exceeded is important because it confirms whether the problem is persistent. A single high result may reflect unusual conditions at the time of sampling, but a confirmed exceedance tells you that you need to act—either by installing treatment or finding another safe source of drinking water. Recommended parameters and guideline types are outlined in Table 2.

Cost is a real concern for many Nova Scotians. That is why the guidance emphasizes using standard packages and focusing on parameters that have direct health implications. Where possible, homeowners can use point-of-use treatment systems (for a single tap) to reduce costs, especially when the concern is a specific chemical like arsenic or uranium.

Reference Information

Table 2: Recommended chemical parameters to test

CHEMICAL PARAMETER	REASONS FOR TESTING
Aluminum Antimony Arsenic Barium Boron Cadmium Chromium Copper Fluoride Lead Manganese Nitrate Nitrite Selenium Strontium Uranium	These are chemical parameters of primary concern as they may cause health problems. These values all have Maximum Acceptable Concentrations (MAC) in drinking water, as determined by Health Canada.
Chloride Colour Iron pH Sodium Sulphate Total Dissolved Solids Zinc	These parameters have guideline values known as Aesthetic Objectives (AO) for drinking water as determined by Health Canada. They may cause concerns for taste, odour and colour and may affect water treatment processes.
Alkalinity Ammonia-Nitrogen Calcium Conductivity Hardness Magnesium Potassium Total Organic Carbon Turbidity	These parameters act as Indicator Parameters that can alert you to potential related problems with your water or water system (e.g. Total Organic Carbon may indicate input from a shallow water source). Some may also affect water treatment.

These parameters are included in many standard packages offered by accredited labs.

Table 3: Common water quality problems

CHEMICAL PARAMETER	POTENTIAL EFFECTS
Arsenic	Health problems — Drinking water with high arsenic levels for a short time can cause nausea, diarrhea, and muscle pain. Long-term exposure to lower levels can increase the risk of certain cancers.
Chloride	Salty taste. Can make water more corrosive to pipes and fixtures.
Coliform bacteria (total coliform and *E. coli*)	Indicates that harmful bacteria may be present. Shows that surface water or contamination is entering the well.
Fluoride	Dental fluorosis in children (changes in tooth appearance from too much fluoride while teeth are forming).
Gasoline, oil or other petroleum products	Strong taste and odour. Can also increase the risk of certain cancers.
Hardness	Causes scale (white or gritty deposits) in kettles and plumbing, bathtub ring, and soap scum. Increases soap and detergent use.
Hydrogen sulphide and/or sulphate-reducing bacteria	Rotten-egg smell and taste. Can stain silverware black. Odour is stronger in hot water.
Iron	Red or orange stains on laundry and fixtures, metallic taste, and rust particles after water sits. Can interfere with water treatment systems.
Iron bacteria	Red-brown slime in toilet tanks, iron staining, and unpleasant taste or odour.
Lead	Health problems — Can affect brain and nervous system development in infants and children, and increase cancer risk. Usually comes from plumbing parts containing lead (pipes, brass fixtures, lead solder, pump parts). More common when water is corrosive or has a low pH.

CHEMICAL PARAMETER	POTENTIAL EFFECTS
Low pH	Can corrode pipes and plumbing (often causing blue-green stains from copper corrosion). May cause lead to leach from pipes, brass fixtures, or pump parts. Can increase dissolved metals. May interfere with some water treatment systems.
Manganese	Health problems — Long-term exposure can affect brain development in children, and memory, attention, and movement in adults. Causes black stains on laundry or fixtures and a metallic or bitter taste in coffee and tea. Can interfere with other water treatment.
Nitrate/Nitrite	Health problems — Can cause "blue baby syndrome" in formula-fed infants, a potentially life-threatening condition.
Sodium	May contribute to high blood pressure, especially for people on sodium-restricted diets.
Sulphate	Can have a laxative effect.
Tannins and humic acids	Can cause brown or reddish water colour at high levels and unpleasant taste or odour.
Tannins and humic acids	Cloudy, dirty, or muddy appearance. May indicate a health risk if the source is surface water or if the well is influenced by surface water. Can interfere with water treatment.
Uranium	Health problems — Can cause kidney damage.

Sampling procedures

Chemical sampling must follow accredited laboratory or provincial procedures, including those available at:

- Provincial well water testing site
- Chemical sampling procedure documents
- Laboratory-supplied instructions

Interpretation tools and fact sheets

The province provides tools and resources to help interpret results:

- Drinking Water Interpretation Tool (DWIT): allows entry of test results and compares them to guidelines.
- Drop on Water fact sheets: detailed information on individual parameters, including health effects and treatment options (e.g., arsenic, uranium, manganese, water quantity).

Section 4. Water Treatment Options

What You Need to Do

Choosing a water treatment system can feel overwhelming, especially when many products promise to "fix everything." The truth is that no single treatment system removes all contaminants. The right system depends entirely on your confirmed water test results. This section helps you understand how to choose treatment confidently, what steps to take before spending money, and who can support you along the way.

Confirm the Problem Before You Invest

Before buying any treatment equipment, it is important to retest the parameters that exceeded guidelines. This extra step protects you from purchasing unnecessary or ineffective systems. Always confirm your results with an accredited laboratory, because some field kits or in-home demonstrations may not be accurate or may test only a limited number of substances. Continue using boiled or bottled water if there is a health concern until your second test confirms what needs to be addressed.

This second test builds confidence that you are tackling the right problem and helps ensure that any money you spend goes toward a system that truly protects your household.

Learn What Treatment Options Are Available

Many treatment technologies exist, but each has specific uses. Understanding their differences helps you choose wisely.

Some problems can be fixed by improving well construction, for example, sealing a cracked well cap or correcting drainage around the well. Other problems, especially chemicals or long-term bacterial contamination, require a treatment system sized and selected for your specific water quality.

You may wish to compare options online or contact treatment companies, but remember that treatment systems vary widely, and the most affordable option is not always the most effective. Professional advice can help match the system to your household's needs.

Decide How Much Water You Need to Treat

Treatment systems are usually available in two forms:

POINT OF USE (ONE TAP)

A point-of-use device treats water only at the tap where it is installed. This can often be suitable for locations like the household kitchen tap where water is used for drinking and cooking.

POINT OF ENTRY (WHOLE HOME)

A point of entry system treats all the water entering your home. Examples for when this type of treatment is needed include:

- Bacteria are present (*E. coli* or total coliforms)
- Iron or manganese cause staining
- Concerns over the presence of metals in water such as arsenic or uranium

Whole home systems cost more but are necessary when health or staining issues affect the entire household water supply, and water use at all locations (any tap, fixture, laundry or dishwasher hookup) must be improved.

Understand the Limits of Each System Before You Choose

Different devices work for different contaminants. For example, ultraviolet light (UV) systems kill bacteria but do not remove metals or chemicals. Reverse osmosis (RO) systems remove many chemicals but may work slowly and require storage tanks. Some systems, such as UV systems, can only treat clear water and may require sediment filters beforehand. Others, such as distillation, use more energy and require regular cleaning to stay effective. A comparison of major treatment technologies and the contaminants they address is provided in Table 4.

Because each treatment option has strengths and limits, it is helpful to speak with a water treatment specialist and review your lab results with them. This ensures the system you choose is appropriate for your water.

Choose a Reputable Company

When you decide to buy a treatment system, take your time and gather information. Look for signs of a reliable company, such as:

- A clear explanation of what the system is designed to treat, such as bacteria or specific chemicals (commonly referred to as contaminants)
- Proof that the system is NSF-certified to remove the contaminant you are concerned about.
- Use of accredited lab testing to guide recommendations
- Avoidance of high-pressure sales tactics
- Clear and easy-to-understand warranties and service plans
- Willingness to provide references

These qualities help protect you from spending money on equipment that does not solve your specific water problem.

Make Sure Your Treatment System Is Working After Installation

Once the system is installed, it is important to test both untreated and treated water. This confirms the device is performing as intended and that the contaminant has been reduced to safe levels. Many systems require regular maintenance, such as replacing cartridges, filters, treatment media, or UV bulbs, to remain effective.

After installation, the testing you need is usually limited to the contaminant the system targets. For example, if your system treats uranium, you may only need to test for uranium to confirm proper operation. This approach saves money while still keeping your water safe.

More About This Topic

Choosing a water treatment system is not just about improving taste or appearance. Many systems play an important role in protecting your health, so selecting the right technology for your specific water condition is essential.

Different contaminants behave in different ways. Bacteria such as *E. coli* can be killed with ultraviolet (UV) light or chlorination, but these methods do nothing to remove metals. Metals like arsenic, manganese, or uranium need adsorption media, reverse osmosis, or activated alumina.

Water characteristics also influence how well a treatment system works. For example:

- Cloudy or coloured water reduces the effectiveness of UV systems
- Hard water can reduce the efficiency of reverse osmosis
- Iron or manganese can clog filters that are treating other parameters reducing their effectiveness.

Understanding these relationships helps ensure that you select a system that will work well over time, not just at installation.

Maintenance is another key factor. All systems require ongoing care—changing filters, cleaning components, replacing treatment media, or replacing UV bulbs. Without proper upkeep, even the best treatment device can fail silently. Retesting helps reassure you that the system continues to protect your water.

Because treatment systems can be expensive, retesting before purchasing equipment matters. A confirmed problem ensures that you invest only in what your home truly needs. This is especially important for rural households, families with fixed incomes, or homes managing several water challenges at once.

Reference Information

Table 4: Treatment System Types and Their Considerations

Treatment Technology and Considerations	Arsenic	Lead	Fluoride	Nitrate[5]	Hardness	VOCs[1,2]	Tannins	Hydrogen	Iron/Manganese	Radon	Uranium	Low pH	Microbial[3]
ACTIVATED ALUMINA • Raw water characteristics such as pH, fluoride, and sulphates may reduce efficiency.	●		●								●		
ADSORPTION MEDIA • Specific media are designed to target certain parameters.	●							●	●				
AERATION • For point-of-entry systems. • May require additional disinfection and re-pressurization. • Oxidizes many metallic contaminants, improving efficiency of other treatment units.						●		●	●	●			
ANION EXCHANGE • Competing ions (particularly sulphates) can greatly reduce efficiency. • If used for arsenic removal, units must be properly maintained; otherwise accumulated arsenic may rapidly discharge into the treated water.	●		●	●			●				●		
CATION EXCHANGE (WATER SOFTENER) • Competing ions (particularly iron, manganese, and barium) can greatly reduce efficiency.		●			●				●				
CHLORINATION • For point-of-entry systems.								●	●				●

Treatment Technology and Considerations	Arsenic	Lead	Fluoride	Nitrate[5]	Hardness	VOCs[1,2]	Tannins	Hydrogen	Iron/Manganese	Radon	Uranium	Low pH	Microbial[3]
DISTILLATION • For point-of-use systems. • Produces water slowly in batches. May require storage. • High total dissolved solids (TDS) or hardness can lead to scaling and decreased efficiency. • Makes water more corrosive. • Some VOCs may recondense with the treated water and dissolved gases may need to be vented, therefore distillation is generally not recommended for treatment of these parameters.	●	●	●	●	●	●	●	●	●	●	●		●
GRANULAR ACTIVATED CARBON • Treatment efficiencies may vary somewhat, depending upon water quality and design of the granular activated carbon treatment unit. • Natural organic matter can reduce efficiency. • Bacteria may grow in the units, therefore additional disinfection may be required. • Often incorporated with other point-of-use treatment systems.						●		●		●			
MANGANESE GREEN SAND • Effective for reduction of high iron and manganese concentrations. • Requires periodic regeneration of media using potassium permanganate chemical solution.								●	●				

Treatment Technology and Considerations	Arsenic	Lead	Fluoride	Nitrate[5]	Hardness	VOCs[1,2]	Tannins	Hydrogen	Iron/Manganese	Radon	Uranium	Low pH	Microbial[3]
OZONATION • For point-of-entry systems.							●		●				●
pH ADJUSTMENT • To reduce plumbing corrosion and elevated dissolved copper and lead. • These systems may use passive dissolution of a replaceable media such as calcite or a more active chemical feed method.												●	
REVERSE OSMOSIS • Some membranes are chlorine-sensitive. • High hardness reduces efficiency. • Storage typically required due to low production rate. • Makes water corrosive – may require pH adjustment for point-of-entry systems. • May require repressurization. Ultraviolet Light (UV)4 • High levels of turbidity or colour limit effectiveness. • Must be NSF 58 certified.	●	●	●	●	●				●		●		
ULTRAVIOLET LIGHT (UV)4 • High levels of turbidity or colour limit effectiveness. • Must be NSF 55 (Class A) certified.													●

[1.] Volatile organic contaminants (VOCs) include organic chemicals and solvents that vaporize at relatively low temperatures. Some typical VOC chemical include benzene, carbon tetrachloride, perchloroethylene (PCE), and trichloroethylene (TCE). [2.] Point-of-use devices used for treatment at specific locations will not provide exposure protection at other untreated locations. [3.] Microbial contaminants include bacteria, viruses, and protozoa. [4.] Suspended solids present in water (not shown) may be removed by standard particulate filtration. [5.] Nitrate treatment using point-of-use devices is not recommended due to the risk from unknowing use of other, untreated household water sources. There is the potential for acute health effects for consuming nitrate by certain vulnerable segments of the population (e.g., hemoglobinemia or blue baby syndrome).

After-Installation Testing Recommendations

- Test both treated and untreated water.
- Testing may focus on the specific contaminant the system targets (e.g., uranium) instead of testing for all potential contaminants.
- Continue regular bacterial testing every year.
- Conduct additional testing based on the treatment system manufacturer's recommendations or at least once per year for bacteria and once every five years for chemicals.

Certified Contractors in Nova Scotia

Nova Scotia encourages homeowners to work with:

- Certified well contractors for well construction or repairs
- Accredited labs for water tests
- Reputable treatment companies that use NSF-certified systems

Section 5. Maintaining Your Water Treatment

What You Need to Do

Private well water treatment systems need regular attention to stay effective. Even systems that seem to be working, such as UV lights that still glow or filters that look clean, may no longer be protecting your water. This section explains how to test your water, how to inspect your well, and how to maintain and check your treatment equipment so you can be confident your family's water is safe.

Test Your Water Regularly

Testing tells you whether your treatment system is working and whether anything has changed in your well.

EVERY YEAR
You should:

- Test bacterial quality in both untreated and treated water
- Do a visual inspection of your wellhead for cracks, loose caps, or standing water around the well

Testing both untreated and treated water helps you see if:

- Your well is free from bacteria
- Your treatment system is still doing its job

EVERY 5 YEARS
You should:

- Test chemical quality for both untreated and treated water
- Test bacterial quality at the same time
- Complete your annual well inspection

Chemical testing every five years confirms whether levels of metals and minerals, such as arsenic, manganese, and nitrate, have changed over time.

TEST SOONER IF SOMETHING CHANGES

Test again if:

- Taste, smell, or colour changes
- Water becomes cloudy (turbid)
- You see new staining (orange, black, or blue green)
- Your treatment system has been installed, repaired, or serviced
- Flooding or heavy rainfall affects your property
- Your treatment system's manufacturer recommends more frequent testing

If something looks or feels different, it is better to test early.

Inspect Your Well Each Year

At least once a year, take a moment to look closely at the area around your well:

- Make sure the well cap is tight and not cracked
- Check that water drains away from the well
- Remove debris, leaves, or materials that have built up or are stored near the well
- Look for signs of insects or animals getting into the well
- Note any recent work near the well (landscaping, construction, traffic)

A small issue, like a cracked cap, can allow surface water or insects to enter the well.

Maintain Your Treatment System

Many treatment systems need regular maintenance to keep them working. The type of care depends on your system.

Most homeowners can usually:

- Replace various different types of filters and treatment media
- Replace UV bulbs following manufacturer instructions
- Fill and maintain salt levels in softeners
- Keep the area around the system clean and dry

Some maintenance should only be done by trained professionals, especially when it involves:

- Strong chemicals
- Pressurized tanks
- Electrical components near water
- Advanced systems like ozone, aeration, ion exchange, and reverse osmosis

If you are not sure how to maintain your system safely, contact a qualified water treatment professional.

Use the Testing and Inspection Log

The Testing and Inspection Log is designed to help you remember what to do each year. Here is how it works:

- **Year 1:** Test both bacteria and chemicals on untreated and treated water; inspect the well
- **Years 2–4:** Test bacteria and inspect the well
- **Year 5:** Test bacteria and chemicals again for both untreated and treated water; inspect the well
- Then repeat the five-year cycle

You can keep the log as a simple checklist or notebook entry. The recommended five-year cycle is summarized in Table 5.

When to Call a Professional

Call a qualified water treatment professional if:

- Maintenance requires strong chemicals or special tools
- Your treatment system has not worked properly after routine maintenance
- Treated water pressure changes suddenly, but untreated water pressure remains unchanged even after routine maintenance

Call a certified well contractor if:

- Bacteria return repeatedly after disinfection
- You suspect surface water or insects are entering the well
- Well performance changes suddenly (pressure drops, pump problems)

This helps protect your well and ensures your treatment system works safely.

More About This Topic

Treatment systems do not last forever. Filters clog, media become exhausted, and UV bulbs weaken even while they still produce light. Some systems, especially those using chemicals or advanced technology, require precise adjustments to stay effective.

Why you need to test treated AND untreated water

Testing both treated and untreated water helps answer two questions:

1. Is the water in your well changing either due to changes over time or issues with the well, such as due to surface water infiltration
2. Is your treatment system still doing its job to treat your water?

By answering these questions you will know which part of the system needs attention.

Why annual well inspections matter

A cracked well cap or poor drainage can allow surface water or insects to enter your well. Surface water may contain bacteria, chemicals, or other pollutants. A quick visual inspection can prevent problems long before they show up in test results.

Why some maintenance is best left to professionals

Some tasks involve caustic chemicals, electrical components, or pressurized equipment. These can be hazardous without training. Table 6 shows that some systems require regeneration, media replacement, pump service, or chemical feed adjustments—tasks that need professional skill.

Why a log helps

People rely on memory, and treatment schedules often get forgotten. A log helps ensure you complete essential tasks and provides helpful information if you need professional support.

Reference Information

Table 5: Testing and Inspection Log

MAINTENANCE SCHEDULE	ITEM	INSPECT WELL	UNTREATED WATER	TREATED WATER
Year 1*	Bacterial and chemical samples Inspect well	●	●	●
Year 2	Bacterial sample Inspect well	●		●
Year 3	Bacterial sample Inspect well	●		●
Year 4*	Bacterial sample Inspect well	●		●
Year 5*	Bacterial and chemical samples Inspect well	●	●	●

Table 6: Treatment System Maintenance Requirements

TREATMENT TECHNOLOGY	OPERATION AND MAINTENANCE REQUIREMENTS
Activated Alumina[1]	Replace spent cartridges. Replace particulate pre-filters, if used. Backwash the unit periodically. Clean and maintain the storage tank, if used.
Adsorption Media	Replace the media.
Aeration	Replace particulate pre-filters. Replace air filters on both the intake and the exhaust. Maintain the fan, motors, and repressurization pumps. Replace post-treatment granular activated carbon (GAC) polishing filters. Clean and maintain the storage tank.

TREATMENT TECHNOLOGY	OPERATION AND MAINTENANCE REQUIREMENTS
Anion Exchange	Replace spent resin cartridges or media. Replace particulate pre-filters, if used. Regenerate regularly and backwash periodically. Replace the salt used for resin regeneration. Clean and maintain the storage tank, if used.
Cation Exchange	Replace spent resin cartridges or media. Replace particulate pre-filters, if used. Regenerate regularly and backwash periodically. Replace the salt used for resin regeneration.
Distillation	Clean and maintain the storage tank, if used. Clean the boiling chamber regularly. Replace particulate pre-filters, if used. Replace post-treatment granular activated carbon (GAC) polishing filters. Clean and maintain the storage tank.
Granular Activated Carbon (GAC)	Replace spent cartridges. Replace particulate pre-filters, if used. Clean and maintain the storage tank, if used.
Manganese Green Sand	Backwash periodically. Regenerate the media.
Ozonation	Replace pre-filters, if used. Clean and maintain the ozone generator, treatment tank, and storage tank. Maintain repressurization pumps, if used.
pH Adjustment	Add chemical or replenish media
Reverse Osmosis	Replace exhausted membranes, particulate pre-filters, and post-treatment granular activated carbon (GAC) polishing filters. Clean and maintain the storage tank. Maintain repressurization pumps, if used. Replace UV bulbs.
Sediment Filtration	Replace sediment filters periodically.
Ultraviolet Light	Clean the bulb housing. Replace the UV bulb according to the manufacturer's recommended schedule.

[1] The regeneration process for activated alumina is complex. It requires the use of strong caustics and acids. Storing these in your home presents potential health risks. To avoid these risks, we recommend that you choose a point-of-entry activated alumina system that requires replacement of media over one that requires regeneration of media.

Section 6. Water Quantity and Well Yield

What You Need to Do

How much water your home needs

Every household needs enough water each day to handle drinking, cooking, washing, bathing, laundry, and other uses. A good rule of thumb is to plan for about 340 litres of water per person per day (about 75 imperial gallons per person per day). For a typical four-person home, this adds up to roughly 1350 litres per day (about 300 imperial gallons).

You may need more water if:

- You have a large family or several bathrooms
- You water gardens or lawns regularly
- You have livestock
- You use water for a hot tub, pool, or other high-use fixtures
- Your treatment systems backwash or flush frequently

Knowing your daily needs is the first step in deciding whether your well can keep up.

Find out what your well can supply

If you have access to your well construction record ("well log"), it can tell you:

- Well depth and diameter
- The length of casing
- The static (non-pumping) water level
- The estimated well yield at the time of construction
- Basic geology encountered during drilling

If you do not have a copy, you may be able to:

- Get it from the original well driller
- Search for it in the Nova Scotia Well Logs Database
- Request a search through Nova Scotia Environment and Climate Change (a fee may apply)

If you cannot find your well log or if conditions have changed since the well was built, you should consider asking a certified well contractor or qualified groundwater professional to evaluate your well. They may review existing information and conduct a yield test.

Understand when wells are "low yield" and what to do

A well's yield is the maximum rate at which it can supply water without being pumped effectively dry. Many wells in Nova Scotia have yields that are enough for everyday use, but some have lower yields and may require special management.

As a general guide:

- Wells producing less than about 10–15 litres per minute (2–3 imperial gallons per minute) are often called low-yield wells
- Wells producing less than about 1 litre per minute (about 0.25 imperial gallons per minute) are often not adequate for typical household use, unless you use special measures or strict water conservation

If your well is low-yielding, consider talking to a certified well contractor or groundwater professional about options such as:

- Drilling or digging a new well
- Deepening the existing well or performing well remediation
- Adding water storage (e.g., larger pressure tanks or storage tanks)
- Reducing water demand, especially during peak times
- Reducing water used by treatment backwash where possible

Special considerations for dug wells

Dug wells often have low yields but large storage capacity because of their wide diameter. This means they might still provide enough water over a day, even if water seeps in slowly, especially if household use is spread out.

However, accurately testing yield in dug wells is complex. A professional may:

- Pump the well down quickly and
- Measure how fast water levels recover over time
- Repeat pumping and recovery cycles to estimate yield

These tests can take 24 hours or more and should be designed by qualified professionals.

Plan for dry weather and drought

Groundwater levels rise and fall with the seasons and with longer dry periods. During times of low rainfall or drought, the water table drops, and wells may:

- Have less stored water
- Refill more slowly
- Stop producing water if the level drops below the pump intake

Wells most at risk include:

- All dug wells
- Shallow drilled wells less than about 15 metres deep (deeper wells can also be affected depending on local conditions)
- Over the long term, the most reliable solution is to replace shallow wells with a deeper, properly sealed drilled well. This helps protect your water supply during dry periods and drought

If you know your area is heading into a dry period, you can:

- Reduce water use (shorter showers, delay lawn watering, car washing, and pool filling)
- Spread out tasks with high water demand over the day
- Ask a certified well contractor whether the pump intake can be safely lowered if water levels have dropped

The province provides Water Shortages guidance to help households plan and respond during low water periods.

Use well logs and pump installers to protect your water supply

Well construction records and professional advice are important tools for managing your water quantity. After well construction, certified pump installers typically choose pumps and settings (depth, rate, pressure) based on:

- Well type (dug or drilled)
- Storage capacity (based on depth and diameter)
- Well yield
- Static water level
- Height water must be lifted above ground
- Pressure tank size
- Plumbing layout and treatment equipment installed

Working with certified installers helps ensure your pump is not drawing water faster than the well can safely supply it.

If cost is a concern

Professional yield testing, storage systems, and new wells can be expensive. If budgets are tight:

- Focus first on water conservation and adjusting your daily use patterns
- Ask contractors whether existing records can be used before ordering new tests
- Consider adding external water storage if feasible, rather than immediately drilling a new well

More About This Topic

The capacity of your well to supply water depends on two main factors:

1. **Storage**—how much water is sitting in the well at any given time
2. **Yield**—how fast water from the surrounding rock and soil can flow into the well while you are pumping. Yield can be limited by both geology and well construction.

A deep, narrow drilled well can sometimes store enough water to supply a household that uses water intermittently throughout the day, even if its yield is low. A dug well may have large storage, but a very low yield. Understanding both storage and yield helps you decide whether your current well is likely to meet your needs, especially during dry conditions or peak usage times.

The 340 litres per person per day estimate includes typical indoor uses, showers, laundry, and dishwashing. It assumes some variety in daily use patterns and helps households plan without overcomplicating calculations. The 1350 L/day figure for a four-person household is based on the per-person rate.

The "low yield well" threshold (10–15 L/min) provides homeowners a way to understand what is the minimum yield necessary for typical household use from a well. A well that produces 1 L/min or lower has little margin for peak demands like simultaneous showers, laundry, and dishwashing unless there is additional storage capacity.

Groundwater levels naturally fluctuate, but human activities can also cause changes. When many wells pump from the same area, well interference can lower the local water table. Construction, blasting, or land drainage projects can alter how water moves through the ground (subsurface), affecting storage and yield. These changes may not be visible at the surface, but they show up as reduced well performance.

The volume tables (Table 7 and Table 8) in the Addendum (litres per metre or imperial gallons per foot by well diameter) allow more precise calculation of how much water is stored in your well. For example, a 150 mm (6") drilled well has about 18.2 litres of water per metre of water column. If the static water level is 20 m above the pump intake, you would have about 364 litres (18.2 × 20) in storage. Understanding this helps you and a professional determine whether your well has enough stored water to cover peak usage, even when yields are modest.

Figure 1 below shows five examples of how different combinations of drilled well depths (storage) and known well yield conditions can provide the average daily quantity requirements of 1350 litres per day for a four-person household. This is based on a 6-inch well, which is the standard size for modern wells drilled today.

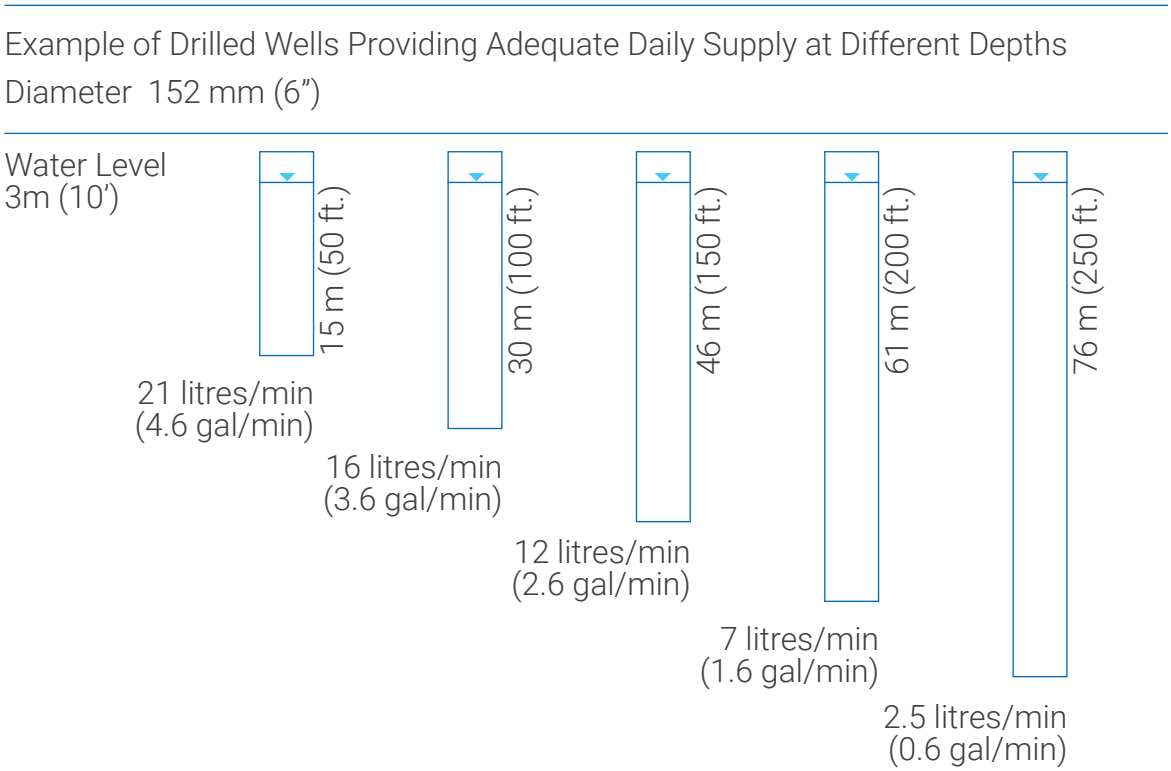

Figure 1 – Drilled wells with various yields and depths that can meet typical household domestic water quantity needs - updated from Nova Scotia Environment and Labour, 2004.

Reference Information

Daily water requirements

- Recommended daily water quantity: about 340 litres per person per day (~75 imperial gallons)
- For a typical four-person household: about 1350 litres per day (~300 imperial gallons per day)

Well yield definitions and test methods

- Well yield: Maximum pumping rate that can be supplied by a well without lowering water levels below the pump intake. Expressed in L/min or volume per day
- Initial well contractor tests often include:
  - Air lifting using the drill rig (e.g. for 1 hour)
  - Bailing (e.g., for 1 hour)
  - Short-term pumping (e.g., 6 hours) immediately after construction
- Longer pumping tests (up to 24 hours for residential wells) provide more accurate yield estimates. They require:
  - A pumping system
  - Detailed measurement of pumping water levels during the test
  - Analysis afterwards
- Different evaluation methods apply for drilled and dug wells; these tests should be designed and interpreted by professionals

Low-yield well criteria

- Low-yield wells are often described as producing less than about 10–15 L/min (2–3 IGPM)
- Wells with yields less than about 1 L/min (~0.25 IGPM) are often inadequate for typical household use, except under specific conditions or restricted usage

Well yield testing

- Dug wells: often low yield but high storage due to their large diameter
- Yield testing for both dug and drilled wells is complex and professional assistance should be obtained

Addendum: Volume of water in wells

These tables allow calculation of total storage by multiplying litres/metre by the height of the water column.

Table 7: Drilled wells - Volume of Water

WELL DIAMETER (INSIDE) (Drilled Wells)		**WELL VOLUME** (amount of Water in Well)	
mm	inches	Litres/M	Imp. Gallons/ft
100	4	8.1	0.54
130	5	12.7	0.85
150	6	18.2	1.22
200	8	32.4	2.17

Table 8: Dug wells - Volume of Water

WELL DIAMETER (INSIDE) (Dug Wells)		**WELL VOLUME** (amount of Water in Well)	
mm	inches	Litres/M	Imp. Gallons/ft
760	30	456	30.6
915	36	657	44.0
1070	42	984	60.0
1220	48	1168	78.3

NOVA SCOTIA