



WATER TESTS

WHAT DO THE NUMBERS MEAN?



PennState Extension

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ABOUT THIS PUBLICATION

Congratulations! If you are interested in this publication, you must have had your water tested. That's a big step toward ensuring your water supply is safe to drink. But, are you able to understand and interpret what your water test report really means? Water test reports sometimes seem as though they are written in another language. That's where this publication fits in—it will help you translate your water test report into more understandable terms.

If water tests are completely new to you, start by reading the first few pages to see a typical water test report and get specific explanations of drinking water standards and measurement units. If you're more experienced with water tests, you might want to go straight to the detailed discussion of 40 common water quality problems in Pennsylvania or consult the quick reference guide that summarizes these 40 contaminants in one table. More detailed information is available on many of the topics; see the resources provided near the end of this publication. You can even get some tips on what to do if your water test report indicates a water quality problem. A detailed listing of up-to-date drinking water standards and a glossary that defines some of those confusing water quality terms are provided at the back of this publication. Finally, you can use the last two pages to compile a record of information essential to the operation of your water supply.

Your water test report may look confusing, but with a little help you'll be able to make sense of it in no time! If you're ready, let's start learning about your report and what it tells you about the safety of your drinking water.

WHY TEST YOUR WATER?

If you've had your water tested, you probably did so to find out if it is safe to use as a drinking water supply. Even if your water tastes, smells, and looks fine, water testing is necessary since many contaminants have no obvious odors or tastes. In other cases where a water quality problem is obvious, testing can determine the exact concentration of the pollutant in order to help determine the best solution to the problem.

Water testing is especially necessary if your house is served by a private water system, as many of these systems have water quality problems. Private water systems include drilled wells, dug wells, springs, or cisterns that serve an individual home. There are no regulations or laws that require water testing, system maintenance, or water treatment on these water supplies. Rather, owners must voluntarily arrange for water testing and correct any problems to provide safe drinking water. Regardless of whether your water supply is private or public, the information in this publication will help you interpret your water test results.

If you live in a community that is served by a public water supply (i.e., one source of water for multiple customers), then the water company already does water testing for you. Public water suppliers are required by law to routinely test their water and treat it to meet water quality standards. They are also required to issue water test reports to their customers on a regular basis. This publication may also be helpful for interpreting these reports.

Although drinking water standards are applicable to all types of water supplies, they are not legally binding for private water supplies. However, it is recommended that private water supply owners maintain their water quality to the same standards required by law for public water supplies.

USE A CERTIFIED LABORATORY

Always have your water tested by a certified water testing laboratory. The Pennsylvania Department of Environmental Protection (DEP) certifies water testing laboratories in Pennsylvania to ensure they are using analytical procedures designed to give accurate test results. Be sure to ask if the lab is certified every time you have your water tested. Laboratories are reevaluated periodically, and their certification status may change. You can obtain a list of certified labs from your local DEP office, which can also arrange for bacteria testing through their state laboratory.

Be cautious of water test results from uncertified labs. In addition, be cautious of water test results from salespeople and others who say they have their own laboratories or try to test water at your residence. Always have these tests confirmed by a certified laboratory and, if possible, interpreted by a knowledgeable and neutral third party before taking corrective action.

Once you have received your water test report from the laboratory, you're ready to interpret exactly what it means. The example water test report on the next page will get you started by familiarizing you with the information presented in the report.



FOR MORE INFORMATION ON HAVING YOUR WATER TESTED

Testing your water is like a trip to the doctor. If you have no idea what is wrong, the doctor will have to run every known test to pin down the problem, and the cost could be enormous. An article on testing your drinking water is available online at extension.psu.edu/testing-your-drinking-water to help you determine which water tests are most appropriate for your water supply.

A TYPICAL WATER TEST REPORT

Water Analysis Report

Client:

John Doe
12 University Street
Anytown, PA 1000

Sample Number: 1000034 **Date/Time Sampled:** 3/22/00 10:00 a.m.
Sample Description: Well water at kitchen tap **Date/Time Sample Received:** 3/22/00 1:00 p.m.
Sampled By: Client

Analysis	Result	Unit	Standard
Total Coliform Bacteria	20	per 100 ml	0 per 100 ml
Fecal Coliform Bacteria	ND	per 100 ml	0 per 100 ml
pH	7.2	pH units	6.5 to 8.5
Hardness	7.3	gpg	no standard
Total Dissolved Solids	260	mg/L	< 500 mg/L
Iron	0.4	mg/L	< 0.3 mg/L
Nitrate-Nitrogen	4.23	mg/L	< 10 mg/L
Lead	11	µg/L	< 15 µg/L

Comments:

Sample does not meet safe drinking water standards. Total coliform bacteria are present. Iron concentration is above recommended level. Water should be disinfected to remove bacteria. Treatment of iron may be necessary if staining or taste are objectionable.

Submitted by:

Laboratory Director
Anylab Laboratories Inc.

THE COMPONENTS OF A TYPICAL WATER TEST REPORT

Pennsylvania has dozens of water testing laboratories, each with its own way of presenting results. Your water test may not look exactly like the one shown on the previous page, but it probably contains the same basic components. Read about each water test component below and try to find it on your own water test report. Remember that these are only the most common components of a typical water test report. Some laboratories will include additional information, such as the method used for each test (usually an Environmental Protection Agency [EPA] number), the initials of the person who completed each test, and the date each test was completed. This information is generally unimportant to the client.

1. Client and Sample Information

Basic information at the top of most water test reports identifies the person who submitted the water sample, where the sample came from, who received it at the laboratory, etc. This is called the chain-of-custody information and could be very important if the results were to be used in any type of legal action.

2. Analysis

All water test reports will list the water quality parameters that were tested. The list will include only those that you asked the laboratory to analyze or those that the lab recommended for your water sample. The number of parameters can vary from just a few to dozens of tests. Consult other sections of this publication for a description of each of these tests.

3. Results

The most important information on your water test report are the actual results that the laboratory found for your water sample. The numbers indicate the concentration of each water quality parameter in your water sample. In some cases, the unit of measure for each test will be shown next to the result. In others, the units will be shown in a separate column (as in the example test report). The result for each test should be compared to the drinking water standard for that parameter. Sometimes a water test result will be reported as “ND” (not detected), which means that the lab was unable to detect any of that pollutant with its equipment. Similarly, some results may have a “less than” sign (<) in front of a number. This result means the sample contained less than the detection level for that test. Detection levels are often set at the permissible drinking water concentration for a particular pollutant. If the “less than” symbol (<) appears before a number and the number is equal to the drinking water standard, then the water is likely safe to drink for that particular contaminant.

4. Units

Concentrations of pollutants in water are usually measured by a unit of weight, such as milligrams per liter (mg/L), or by number, such as number of bacteria per 100 milliliters of water (#/100 ml). You might see several different measurement units on your water test report. Refer to the “Understanding Units” section on the next page to learn more about these.

5. Standards

Many laboratories include the specific drinking water standards on the report next to each test result. This allows for an easy comparison of your result with the safe or recommended level for each test parameter. See Appendix A for a complete list of up-to-date drinking water standards.

6. Comments

Some water testing laboratories will include a brief explanation of your water test results. Specifically, they will often list those pollutants that did not meet the drinking water standard. Occasionally, these comments will also describe the potential harmful effects of pollutants that exceeded the standard and how these pollutants can be removed from the water.

WHAT ARE DRINKING WATER STANDARDS?

Drinking water standards give the level of a pollutant that is acceptable in water. These standards are set by the U.S. Environmental Protection Agency (EPA) using available research data. EPA sets standards for contaminants that are known to occur in water, detectable in water, and cause a health or aesthetic problem in water. While EPA sets these standards, it is up to the Pennsylvania DEP to enforce them when and where they apply.

Two types of drinking water standards are used: primary and secondary. Primary standards are set for contaminants that cause some health effect such as illness, disease, cancer, or another health problem. Adherence to these standards is mandatory for public water systems but voluntary on private water systems. Primary standards are also known as maximum contaminant levels (MCLs).

Secondary standards are created for water contaminants that cause aesthetic problems, such as bad taste, discoloration, or odor. In the past, these standards were always voluntary and used mainly as guides. Recently, however, some community water systems have been required to meet some of these secondary standards. Secondary standards are also known as secondary maximum contaminant levels (SMCLs) or recommended maximum contaminant levels (RMCLs).

A complete listing of primary and secondary drinking water standards is available on the Pennsylvania DEP website.

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