



U.S. ARMY

FACT SHEET READING PFAS LABORATORY RESULTS

Reading laboratory data reports and interpreting results can be confusing. We hope this fact sheet will help you understand your laboratory report from the sampling of your water for PFAS (per- and poly-fluoroalkyl substances). Terminology can vary between laboratories.

Reading the Results of your Lab Report

Lab reports typically have several sections, including: 1) the cover page, 2) definitions/glossary, 3) the case narrative, 4) the client sample results, and 5) several sections relating to laboratory quality assurance/quality control (QA/QC) practices.

In the client sample results section, you will find the analysis performed by the lab, the test results, and notes that indicate any problems encountered. These notes are called “qualifiers”. Most labs use a standard set of qualifiers, which are defined and discussed on page 2 of this fact sheet. The example below shows the result for two PFAS as reported in the “Client Sample Results” section of the lab report.

Example table showing test results and what the notation means

Analyte	Result	Qualifier	RL	MDL	Units
Perfluorooctanoic Acid (PFOA)	7.5		1.7	0.21	ng/L
Perfluorohexanesulfonic Acid (PFHxS)	ND		1.7	0.14	ng/L

Notes:
 RL = reporting limit
 MDL = method detection limit
 ng/L = nanograms per liter (equal to parts per trillion)

ND = the contaminant has not been detected

If a contaminant is not found in a sample, the “result” column in the laboratory report will show “ND” - not detected. ND means the chemical is not present in the sample at a high enough level for the laboratory equipment to detect.

RL = Reporting Limit

The reporting limit is the lowest concentration of the substance tested that can be reported reliably under normal laboratory conditions. This is sometimes also referred to as the limit of quantitation of “LOQ”.

MDL = Method detection limit

Each laboratory method has the ability to detect chemicals down to a certain concentration, known as the MDL or “method detection limit”. Anything below the MDL would not have been found because it is below the test equipment’s ability to detect it.

In the example above, PFOA was detected at 7.5 ng/L and PFHxS was not detected (ND), meaning PFHxS was not present in the sample above the MDL. It may be that PFHxS was not present at all in the sample, or it could have been present but at a very low concentration, less than 0.14 ng/L.





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Data Qualifiers — “J” or “B” next to the result

All laboratory information is reviewed by a chemist to ensure it meets specific quality criteria. Sometimes “qualifiers” are applied to a sample result to note problems or irregularities that may have occurred during analysis. Most labs use a standard set of these codes. The most common qualifiers found in PFAS laboratory reports are “B” and “J” qualifiers.

Example table with data qualifier

Analyte	Result	Qualifier	RL	MDL	Units
Perfluorohexanesulfonic Acid (PFHxS)	2.1	B	1.7	0.21	ng/L
Perfluorononanoic Acid (PFNA)	0.5	J	1.7	0.22	ng/L

Notes:
 RL = reporting limit
 MDL = method detection limit
 ng/L = nanograms per liter (equal to parts per trillion)

“J” qualifier — used to note that the reported concentration is considered estimated.

The “J-flag” is used whenever the measured concentration is lower than the RL but above the MDL.

“B” qualifier — means the chemical was found in both the sample and a “blank”.

When chemicals are found in both the blank and the test sample, the reported value is qualified with a “B” to show the uncertainty in the source of the contamination. In the example above, PFHxS was detected in the sample at a concentration of 2.1 ng/L but it was also detected in the blank, so it is uncertain whether the contamination was present in the water from the test area or whether it was introduced by the laboratory or elsewhere.

A **blank** is a sample container filled with distilled water from outside the test area. A blank should be non-detect for all chemicals, but because PFAS are commonly found in the environment, low-level detections of PFAS can occur in the blank. If a chemical is detected in both the sample and the blank, it is impossible to determine if the concentration reported is from the test area or some other source.

As of October 2022, the U.S. Environmental Protection Agency (EPA) has only released final lifetime health advisory levels on four PFAS compounds - Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), perfluorobutane sulfonic acid and its potassium salt (PFBS) and for hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt (“GenX chemicals”). PFOS and PFOA is what is found most often on Army installations due to the use of aqueous film forming foam for firefighting.

The Army is addressing PFOS and PFOA using the well-established, federal cleanup law, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Army’s priority is to quickly address drinking water with PFOS and PFOA levels above of 70 parts per trillion.

