

Missouri Department of Natural Resources

Understanding The “Result” Column of Sample Analysis Reports

Chemists use complex instruments to analyze samples. Sometimes the substance of concern is not present in high enough concentrations for the instrument to “see” or detect. If a substance was not detected by the laboratory’s instrument, it may be reported in one of two ways. You may see a “less than” or left pointing arrow (<) followed by a number in the results column. Alternatively, there may be a value with no arrow followed by an “ND” in the Qualifier column to the right of the number.

In each of these cases, the number in the Result column for that parameter is the Method Detection Limit (MDL) for that substance. So, for example, if the substance Trichloroethene (TCE) on the sample analysis report has “1.0” in the Results column, “ND” in the Qualifier column, and “ug/L” in the Units column, it means the lab instruments did not detect any TCE in this sample at or above 1.0 ug/L. The MDLs sometimes differ because the instruments vary in sensitivity to each substance.

If a substance was detected in the sample, you will see a number in the Results column without a “less than” arrow beside it, and without an “ND” in the Qualifier column. These numbers require careful interpretation. In order to determine whether the chemical is present at a concentration that may be of concern, the number should be compared to a specific screening benchmark. The department staff evaluating your results will conduct these comparisons and provide more information for any chemicals detected above these benchmarks.

We hope this guide proves helpful. For more information please call Brian Allen with the Environmental Services Program at 1-800-361-4827 or (573) 526-3380.

Understanding Sample Test Results

Example of a General Sample Report

For internal use by the Department

Date report was generated

For internal use by the Department

Each Sample has a unique number assigned by the sample collector

This is the county where the sample was collected


The name of the person who collected the sample

This describes the type of sample collected

This is the type of test that was used

Description of the sample location

The sample was tested to see if it contained the substances in this column



Missouri Department of Natural Resources
Environmental Services Program

Order ID: 030418004 Program, HWP, Joe Smith
Report Date: 5/20/2003 LDPR: QEPA6/NJ03XXXX

Order Comment:

Sample: 030418004-01 Facility ID: Site: XYZ Company
Customer # 0300928 County: Pemiscot Collect Date: 4/16/2003
Collector: Joe Smith Affiliation: ESP Collect Date: 4/16/2003
Sample Comment: Groundwater Sample Collected from Monitoring Well MW-01 Collect Time: 11:16 AM

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	1,1,1,2-Tetrachloroethane	1.0	ND	ug/l	Q0605-09VOAs	8260B
VOAs	1,1,1-Trichloroethane	1.0	ND	ug/l	Q0605-09VOAs	8260B
VOAs	1,1,2,2-Tetrachloroethane	890	07	ug/l	Q0605-09VOAs	8260B
VOAs	1,1,2-Trichloroethane	1.0	ND	ug/l	Q0605-09VOAs	8260B

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

Qualifier	Description
01	Improper collection method
02	Improper preservation
03	Exceeded holding time
05	Estimated value, detected below PQL
06	Estimated value, QC data outside limits
07	Estimated value, analyte outside calibration range
08	Analyte present in blank at > 1/2 reported value
09	Sample was diluted during analysis
10	Laboratory error
ND	Not detected at reported value

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This specifies who within Department is to receive the test results

This is an internal code designating how the test are to be paid for

Site Name

Date sample was collected

Time sample was collected

This number specifies the method used to perform the test

Number to document the laboratory's quality control

The unit of measure for each test result is shown in this column. See Common Notations below.

Data qualifier related to the value in the "Result" column. See Qualifier Description list at bottom report for description

The results are shown here. The numbers are compared to either a sample from an uncontaminated area or a specific health-based standard before drawing conclusions. See Common Notations below.

Common Notations

- < A symbol for "less than". It means a substance could not be detected by laboratory instruments. The number following the symbol indicates the instrument's lowest possible setting for the sample.
- ug/Kg This means micrograms per kilogram. This measurement is generally used with soil samples. It is also often referred to as parts per billion (ppb).
- mg/Kg This means milligrams per kilogram, which is also referred to as parts per million (ppm).
- ug/L The means micrograms per liter. This measurement is generally used with water samples. It is also referred to as parts per billion (ppb).
- mg/L This means milligrams per liter, which is also referred to as parts per million (ppm).