

TITLE: **Appropriate Application of Yield and Hydraulic Conductivity Data**

DATE
EFFECTIVE: January 2003

HISTORY: Update of VA30007.03.009 - Revision was necessary to reflect changes in rule citations that became effective in March 2009.

KEYWORDS: Spatial variation, temporal variation, data analysis, classification, ground water, yield, hydraulic conductivity

RULE/
AUTHORITY: OAC 3745-300-07(E)(5)(b); 3745-300-07(F)(2); 3745-300-07(F)(8); 3745-300-07(I)(2)

QUESTION: Once the yield or hydraulic conductivity of a saturated zone has been adequately field-tested, how should a volunteer apply the data to arrive at a value that can be used to classify or identify ground water?

ANSWER: Once a certified professional (CP)/volunteer has identified a saturated zone, determined yield or hydraulic conductivity at an adequate number of locations in the saturated zone, and satisfied any other applicable requirements, the data will need to be analyzed to determine the appropriate ground water classification. OAC 3745-300-07(E)(5)(b) and 3745-300-07(F)(8) require the volunteer to consider spatial and temporal variation to ensure representative data during data analysis. OAC 3745-300-07(I)(2) requires the volunteer to verify assumptions and applicability of statistical methods and other data analysis methods when determining compliance with applicable standards.

For purposes of identifying and/or classifying each ground water zone at the property, the VAP recommends that the central tendency of the data set be used to derive a representative yield or hydraulic conductivity value. For data that fit a normal or a log-normal distribution, the central tendency would be the arithmetic mean and the geometric mean of the raw data, respectively. The results from any test for the normality or log-normality of the data set distribution should also be included with the demonstration, if appropriate. If the data set distribution has not or cannot pass any appropriate test for normality or log-normality, the central tendency of the data set may also be derived by empirical, non-parametric methods. For example, if a data set of yield values consist of 5 data points placed in order from lowest to highest as 1.1, 2.3, 2.4, 3.1, and 4.2 gpm, then the central tendency is 2.4 gpm.

It is important that sufficient data points are available so that the property is adequately characterized (see OAC 3745-300-07(F)(2) and TGC document VA30007.09.014). The VAP does not recommend any generic or fixed number of samples for yield or hydraulic conductivity determination at a property for purposes of the identification or classification of each ground water zone. The appropriate number of samples for yield or hydraulic conductivity determination is affected by the size of the property, the degree of site characterization, and the heterogeneity of the subsurface. Technical assistance is also available to assist the CP/volunteer in making the determination of an adequate number of sample points or in deriving a representative yield or hydraulic conductivity value from a data set.

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