

Appendix to rule 3745-65-93 of the Administrative Code

Test for Significance

As required in paragraph (B) of rule 3745-65-93 of the Administrative Code, the owner or operator ~~must~~shall use the "Student's T-test" to determine statistically significant changes in the concentration or value of an indicator parameter in periodic ground water samples when compared to the initial background concentration or value of that indicator parameter. The comparison ~~must~~shall consider individually each of the wells in the monitoring system. For three of the indicator parameters (specific conductance, total organic carbon, and total organic halogen) a single-tailed "Student's T-test" ~~must~~shall be used to test at the 0.01 level of significance for significant increases over background. The difference test for pH ~~must~~shall be a two-tailed "Student's T-test" at the overall 0.01 level of significance.

The "Student's T-test" involves calculation of the value of a t-statistic for each comparison of the mean (average) concentration of value (based on a minimum of four replicate measurements) of an indicator parameter with ~~its~~that parameter's initial background concentration or value. The calculated value of the t-statistic ~~must~~shall be compared to the value of the t-statistic found in a table for t-test of significance at that specified level of significance. A calculated value of t which exceeds the value of t found in the table indicates a statistically significant change in the concentration or value of the indicator parameter.

Formulas for calculation of the t-statistic and tables for t-test of significance can be found in most introductory statistics texts.