

Statistics for Contaminated Sites

The series of documents listed here provides information and guidance on various aspects of the application of statistics to contaminated sites studies. These publications have been developed by FSS International for the ministry.

Summary of current FSS documents

There are currently 16 guidance documents in this series.

12-1, "[Univariate Description](#)" discusses statistical concepts and presents tools for describing the statistical characteristics of a single variable.

12-2, "[Bivariate Description](#)" addresses the statistical analysis of pairs of variables and presents tools for describing the relationship between variables.

12-3, "[Spatial Description](#)" presents various tools for describing and analyzing data in their spatial context.

12-4, "[Distribution Models](#)" presents basic information on some of the statistical distribution models that are commonly used in contaminated site studies.

12-5, "[Non-Parametric Statistics](#)" discusses statistical procedures that do not depend on distribution models.

12-6, "[Choosing a Distribution](#)" presents advice on how to decide which distribution model is most appropriate.

12-7, "[Identifying Populations](#)" presents tools that can be used to help with the decision of whether to treat the data as one population or to split them into two or more subpopulations.

12-8, "[Outliers](#)" discusses the evaluation and treatment of unexpected and erratic high values.

12-9, "[Estimating a Global Mean](#)" addresses the estimation of an average value over a large area and the quantification of the uncertainty on such estimates.

12-10, "[Composite Samples](#)" presents advice on the interpretation of analytical values from composite samples that have been created from two or more discrete samples.

12-11, "[Statistical QA/QC](#)" discusses issues related to the monitoring, documentation, and control of the reliability and repeatability of sample information.

12-12, "[Sampling Plans](#)" addresses the design of appropriate sampling plans for various purposes throughout the life a contaminated site project.

12-13, "[Classification](#)" provides information on how to classify contaminated material into an appropriate regulatory category.

12-14, "[Stockpiling](#)" discusses the appropriate sampling and classification of stockpiled material.

12-15, "[Reporting](#)" provides general advice on the content of a report of a statistical study for a contaminated site.

12-16, "[Randomization](#)" presents procedures for randomly selecting samples from larger batches and for randomly selecting sample locations.

Alternatives to this technical guidance

All of these FSS statistical guidance documents have the following brief explanatory note in the header on their front page:

"This guidance document is one of a series that outlines important basic statistical concepts and procedures that are useful in contaminated site studies. BC Environment [the BC Ministry of Environment] recommends that these suggestions be followed where applicable, but is open to other techniques provided that these alternative are technically sound. Before a different methodology is adopted it should be discussed with BC Environment."

This makes it clear that the ministry views the information in these guidance documents as an appropriate starting point for statistical studies of contaminated sites. It recognizes that prescribing a rigid procedure is not appropriate for all contaminated sites, and it is willing to consider site-specific alternatives that are technically defensible. We recommend, however, that such alternatives be discussed with the ministry so that consensus can be reached on the appropriateness of different approaches.

Also important to note is that these 16 documents were written before the Contaminated Sites Regulation came into effect. Therefore terms such as "industrial waste," "residential waste," and "total PAH" still appear in some of the documents even though they are not used in the new Regulation.

For more information, contact the Environmental Management Branch at site@gov.bc.ca