Sampling Strategies

Sampling Strategy	Description	Application	Limitation
Statistical Sampling Approaches			
Simple random sampling	Representative sampling locations are chosen using the theory of random chance probabilities.	Sites where background information is not available, and no visible signs of contamination are present.	May not be cost-effective for samples located too close together. Does not take into account spatial variability of media.
Stratified random sampling	Site is divided into several sampling areas based on background or other site information; each area is evaluated using a separate random sampling strategy.	Large sites characterized by several soil types, topographic features, past/present uses, or manufacturing/storage areas.	Often more cost-effective than simple random sampling. It is more difficult to implement in the field and analyze results. Does not take into account spatial variability of media.
Systematic grid sampling	This probably is the most common statistical strategy; it involves collecting samples at predetermined, regular intervals within a grid pattern.	Best strategy for minimizing bias and providing complete site coverage. Can be used effectively at sites where no background information exists. Ensures that samples will not be taken too close together.	Does not take into account spatial variability of media.
Hot-spot sampling	Systematic grid sampling strategy is tailored to search for hot spots.	Sites where background information or site investigation data indicates that hot spots may exist.	Does not take into account spatial variability of media. Chance of missing a hot-spot can be high depending upon the amount of site information available.
Geostatistical approach	Representative sampling locations are chosen based on spatial variability of media.	More appropriate than other statistical sampling strategies because it takes into account spatial variability of media. Especially applicable to sites where presence of contamination is unknown.	Previous investigation data must be available and such data must be shown to have a spatial relationship.
Non-statistical Sampling Approaches			
Biased sampling	Sampling locations are chosen based on available information about site history or past investigations.	Sites with specific known contamination sources.	Contaminated areas can be overlooked if they are not indicated by background information or visual signs of contamination.
Judgmental sampling	An individual subjectively selects sampling locations that appear to be representative of average conditions.	Homogeneous, well-defined sites.	Not usually recommended due to bias imposed by individual, especially for final investigations.