Background Levels

What are they?

Background levels (usually measured in soil) are the levels of contaminants that you might normally expect to find in a place, but that can’t be attributed to a single polluting source. Some toxins may be in the soil because they are naturally occurring, like arsenic or uranium. Others may be due to widespread human use – for example, lead from car exhaust in the mid-20th century spread widely in soil and water. Background levels vary from place to place.

For air and water, different terms may be used for the same idea. Scientists may say “ambient air quality” to mean a background level of outdoor air quality when comparing with contaminated indoor air. But this can be confusing, because there are also ambient air quality standards (see NAAQS) that have nothing to do with background levels.

How are they used?

Comparing a test result to background levels helps show how unusual a test result is. If a test result is significantly above background levels, there might be a specific human cause for the contamination. Showing unusually high test results can help determine legal liability for cleanup costs or shutdowns.

How are they determined?

Background levels are determined by testing over a very large area, like a whole county or state. The background level is often set at a value like the 90th percentile (meaning 90% of the samples were below that level, so it would be unusual to find a sample above that level). Sometimes the background level is simply the average of all the samples.

How are they related to human health?

Background levels and ambient air quality are determined by measurements, not by safety. A test result for a toxin that is close to the ‘normal’ background level might still be a health concern, if the background level is very high. On the other hand, if the background level is very low, a test result might be above background levels but might not be a health concern. For health risk insights, compare test results to health-based standards, not to background levels.