

What are the differences in VOC concentrations observed between low-flow and passive diffusion devices?

The differences are due to a couple of things. When there are significant differences it can be due to contaminant stratification within the well or formation. But there can be a significant difference in concentration from the top to the bottom of the screen where there is no vertical ambient flow or mixing within the well screen itself. So under non-pumped or ambient flow conditions, where a passive diffusion bag sampler is used in different positions in the well, we could see concentration differences of as much as 50% or more. One reason for this is the contaminants are also stratified in the surrounding formation. Another reason is redistribution in contaminant mass within the well due to ambient vertical flow. For example, studies have shown that many times water will enter one part of the screen zone but exist in another part. And we can see some difference in concentration from top to bottom on the screen due to that. A low-flow purging and sampling method or any method that purges the well should obtain a flow weighted average concentration across the screen, so we may not be able to see the highest possible concentration that exists in the formation surrounding the well, but we'll get a consistent flow weighted average concentration. That means we are generally not going to see the highest possible concentration that we might see with the PDB, but we are going to get consistent results from sampling provided that the formation hasn't changed.