Emerging contaminants like per- and polyfluoroalkyl substances (PFAS) are relatively new to the laboratories, and methods have not been long-established, like those for the more familiar analyses such as volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Laboratories have been using a method designed for drinking water and modifying it in order to analyze other matrices and other target compounds, as there were no published EPA methods to cover anything except the drinking water matrix and a limited list of compounds.

New methods are forthcoming for non-potable water, wastewater, and solid matrices, but because those are even newer and have not yet stood the test of time, there is a lot of grey area in how the laboratories may approach the preparation and analysis of the samples. Labs' experience with the methodology and instruments used for analysis, as well as the techniques being used for sample preparation, and even their knowledge of the chemistry of these analytes, vary widely. Instrument and product vendors for analysis of these chemicals have adapted their products to the task, as well as the software and materials used, but many of these products, even those that have been in the laboratories for years, are relatively new to this application.

No two labs are alike in the way they analyze and report PFAS; even individual laboratories within the same network have their own take on the preparation, analysis, and reporting, and the data they produce reflect these differences. The ability of individual laboratories to produce data for these chemicals that can adequately support the results and withstand scrutiny of a regulatory agency or litigious arena vary broadly, as well.

Sampling for PFAS, because these compounds are so commonly found in many widely-used, everyday products, and the analysis technique is so sensitive, has to be done very carefully following strict procedures designed to eliminate the introduction of artifacts. Sample data must be carefully examined for any indication of sampling, sample handling, or laboratory artifacts. The more complex the matrix analyzed, the more complicated the preparation is and the greater the potential for artifacts in this process may be.

It is critical for the data user to have a strong working relationship with the sampling team and the laboratory performing the analyses. All parties involved in the project must be involved in developing, reviewing, and implementing the Sampling and Analysis Plan (SAP), Field SAP (FSAP), and/or Quality Assurance Project Plan (QAPP), to ensure that potential errors

can be minimized and communication will be quick and reliable, in the event any issues arise. The QAPP should include quality control criteria required for the analyses to be performed, as well as copies of the actual laboratory's Standard Operating Procedures (SOPs) that will be followed. Be sure all of the documentation pertinent to the work on your project has been reviewed so that there is a thorough understanding of the entire process.

Check on the laboratory's accreditation for these analytes to be sure they can meet the requirements for your project. Even if your project doesn't require laboratory accreditation, the process the laboratory must follow to obtain and maintain this certification is rigorous and will help you to ensure that appropriate procedures were followed. Performance evaluation blind samples are analyzed on a routine schedule and the laboratory must demonstrate their capability to provide accurate, reliable results.

There are many resources available to help you develop, or broaden, your knowledge base of all things PFAS. Take the time to read literature, attend seminars and webinars, and talk to the technical personnel directing the sampling and analysis to learn as much as you can about how the procedures will be performed and any potential issues that may affect your project's results. You want to end up with results that are accurate, precise, representative of your site, and well-supported by laboratory data and documentation that will withstand review by both chemistry experts and legal or agency representatives.

We recommend that you evaluate your laboratory's operations, data production capabilities, and quality system for these and other chemical analytes pertinent to your project, and assess the usability of the results with respect to accuracy, precision, and defensibility. Make sure you've met your project goals and can support the decisions you will make with defensible data. For assistance or additional information, please contact ECSTeam@ddmsinc.com.