

Trusted Technical Expertise.

Columbia Analytical Services, Inc. offers a wide variety of specialty services throughout our network of NELAP, state and DOD-accredited analytical laboratories. These include:



High Resolution GC/MS Laboratory

Columbia Analytical offers expertise in the analysis of dioxin and dioxin-like compounds. Our 12,099 square foot laboratory features five sophisticated high resolution gas chromatograph/high resolution mass spectrometers (HRGC/HRMS) to perform dioxin and furan testing on a variety of matrices including but not limited to: food products, sediments, animal tissues, water, soil, air, waste, household dust and building products.

High resolution analyses can be run on a wide variety of sample matrices: sediments, animal/marine tissues, paper, incinerator ash, soil, waste water, drinking water, solid waste, food products, food additives, PUF cartridges, XAD resins/filters, household dust, and wipe samples. Methodologies employed include:

EPA Method 8290

EPA Method 23

EPA Method 1613B

EPA Method 1668A

EPA Method 8280A

EPA Method TO-9A

CARB 429

Air Quality Laboratory

Columbia Analytical specializes in the analysis of volatile and semi-volatile organic compounds, sulfur compounds and other hazardous substances in a wide variety of air and vapor matrices. Established in 1988, the specialized air quality laboratory provides high quality data, superior customer service, and reliable project management.

Columbia Analytical provides analytical support for a diverse range of routine and novel applications, including:

- Odor Investigation Methods – Carboxylic Acids, Amines, Ammonia, Aldehydes, Reduced Sulfurs and VOCs
- Soil Vapor Intrusion, Soil Vapor Extraction (SVE)
- Indoor Air Quality/LEED Testing
- Air Phase Petroleum Hydrocarbons
- Ultra Low-Level VOC Analysis for Risk Assessment
- Pulp & Paper NCASI Methods
- Site Characterization and Remediation
- Landfill Permit and Compliance Monitoring
- Characterization of Unknowns
- Biofilter Evaluation Studies
- Product Evaluations and Material Off-Gassing Studies

We have an inventory of over 2000 Summa canisters, and can also provide Tedlar bags, Silco canisters, Mini Cans, sorbent tubes, and other air sampling media and supplies.



Micro-Elemental Laboratory

We also perform micro-elemental analyses (C, H, N, oxygen, sulfur, metals, and halogens) on a wide variety of matrices for the pharmaceutical, electronic, chemical, and contract laboratory industries and for academic research. We have extensive experience working with difficult matrices such as air-sensitive compounds and with samples of extremely limited volume. Each analysis is performed by highly experienced analysts who treat each sample individually depending on the sample matrix. Routine orders are completed in five to 10 working days. Same-day, next-day, and two-day rush services are available at an additional cost.

New Technology

Analytical

Columbia Analytical is constantly expanding its analytical horizons as new technology and techniques are introduced. Indicative of our commitment to innovation are the inclusion of GC/MS/MS, HPLC/MS & HPLC/MS/MS to our analytical arsenal. These technologies have expanded our capabilities to analyze for a wide range of compounds. Applications range from relatively simple environmental projects to complex chemistries associated with the support of clinical trials. Procedures are generally developed on an as-needed basis due to the specific needs and requirements of research and development projects, or project-specific needs associated with the application. Note that a number of procedures are on line that address common requests, particularly related to environmental applications (e.g. pharmaceutical personal care products, steroids and other endocrine disruptors, perchlorate, PFOA/PFOS, PDBEs, and many others).

Passive Diffusion Samplers

Columbia Analytical manufactures the successful polyethylene diffusion bag sampler (PDBs) which eliminates the need for purging in groundwater monitoring projects when VOAs are the analytes of interest. Columbia Analytical also manufactures the Rigid Porous Polyethylene (RPP) sampler that allows gathering samples for inorganic and water soluble volatile and semivolatile analyses.

Other Specialty Services

Marine and Freshwater Sediment, Pore Water and Tissue Sample Analyses

Columbia Analytical is recognized as a leader in the low-level analysis of marine and freshwater sediment, porewater and tissue samples. Numerous analytical procedures are on-line to accommodate a wide range of project specific requirements. In general, the procedures are designed to obtain ultra-trace levels of detection while circumventing non-target background matrix components that hinder routine testing procedures. Multiple analytical options are available for most target compounds, depending on the matrix and detection limit requirements.

Low-Level Mercury

Low level mercury measurements are conducted by EPA Method 1631, a very sensitive analytical technique. In this method, an aqueous sample is oxidized with bromine monochloride and sparged with nitrogen onto a gold trap. The mercury is thermally desorbed from the gold trap into a cold vapor atomic fluorescence spectrometer. Columbia Analytical Services can achieve a method detection limit (MDL) of 0.06 ng/L (ppt), which is three orders of magnitude less than the conventional cold vapor mercury method. While the original method was designed for aqueous samples, Columbia Analytical Services has implemented the Appendix to Method 1631: Total Mercury in Tissue, Sludge, Sediment and Soil by Acid Digestion and BrCl Oxidation. We have achieved an MDL of 0.3 µg/Kg in solid samples.



Emergent Chemicals

Columbia Analytical performs low-level analyses for the emergent chemicals including, but not limited to:

- Perchlorate
- 1, 4-Dioxane
- Total Chromium
- Hexavalent Chromium
- 1,2,3-Trichloropropane (1,2,3-TCP)
- N-nitrosodimethylamine (NDMA)
- Polybrominated Biphenyl Ethers (PBBs)
- Polybrominated Diphenyl Ethers (PBDEs)
- Pharmaceutical & Personal Care Products (PPCPs)

A number of other emerging chemicals of concern are on-line or in development. Due to the evolving nature of this area of testing, Columbia Analytical has the flexibility and versatility to react to requests for new applications by maintaining an expert staff of analytical chemists poised to develop procedures on an as-needed basis.

Organotins

Columbia Analytical has considerable experience analyzing water, porewater, soil, sediment and tissue samples for low level organotins using solvent extraction, derivatization and a gas chromatography flame photometric detector (GC/FPD), consistent with C.A.Krone, et al. and M.O. Stallard, et al.

Hexavalent Chromium

Columbia Analytical employs a number of different methods for the analysis of hexavalent chromium. These include procedures that utilize ion chromatography (low-level applications for aqueous samples), colorimetric chemistry, chemical separation by co-precipitation, and chelation/solvent extraction. Columbia Analytical Services also provides ancillary testing used to characterize environmental systems for the purposes of predicting the fate of hexavalent and trivalent chromium. These include sulfide (total, acid soluble, dissolved, and AVS), ferrous iron, and redox potential.

Pharmaceutical and Personal Care Product Residues

Columbia Analytical offers the analysis of a select list of Endocrine Disrupting Compounds (EDCs), and Pharmaceuticals and Personal Care Products (PPCPs). We have developed analytical methods for these compounds using Liquid Chromatography/Mass Spectroscopy/Mass Spectroscopy (LC/MS/MS). These methods allow for the analysis of a broad array of PPCPs and EDCs with detection limits in low ng/L levels. Columbia Analytical has compiled a target list of PPCPs from a diverse group of pharmaceuticals, personal care products, pesticides and steroids.

Composite Wood Products MACT Testing

Columbia Analytical performs the complete NCASI 99.02 air method, a required test under the Plywood and Composite Wood Panel MACT Rule. We perform both the canister and impinger portions of the method. To date, we have successfully provided analytical support to numerous source testing companies going through the process of demonstrating competence with the procedure as outlined in the method. Columbia Analytical personnel have worked closely with NCASI and others in the wood products industry to bring procedures and processes online that help assure method requirements are achieved.

Boiler MACT Testing

In some cases, this rule requires boilers to test their air emissions for Chloride, Metals, and Particulate Matter. Columbia Analytical provides EPA Method 29 (metals) and EPA Method 26 (HCl). In addition, solid fuels might also be tested under this regulation. Columbia Analytical has worked closely with NCASI to develop appropriate test procedures for the milling and analysis of samples for Total Cl, Total Metals, Mercury, Moisture, and Heating Value. All of these data are required for computations associated with showing compliance with the MACT Rule.

Source Testing

Columbia Analytical provides analytical services to support a wide variety of applications associated with source testing. These include RCRA Trial Burns, MACT performance evaluations, boiler and industrial furnace units (BIFs), as well as numerous miscellaneous applications from a variety of industries. The analysis of emissions, fuel, and/or residue can be included in the scope of services per project. Chemical and physical properties are routinely evaluated. Test parameters include heating value, halogens, halides, ash, moisture, viscosity, density, metals, and other parameters specific to given waste feeds.

Explosives

Columbia Analytical provides low-level HPLC analyses for 14 explosive compounds, including HMX, TDX, tetryl and the various nitrotoluenes, nitrobenzenes and triazines following EPA Method 8330. We perform a modified Method 8330 to analyze for picric and picramic acid and perform EPA Method 8332 for nitroglycerine and PETN. In addition, Columbia Analytical has developed an HPLC method to test for low levels of nitroguanidine.

Glycol Ethers

Columbia Analytical tests for glycol ethers including butyl carbitol, a surfactant which is a constituent of de-icing solutions used by major airports.

Alcohols

Columbia Analytical analyzes samples for low molecular weight alcohols (methanol, butanol, propanol, etc.) that are used as oxygenates in fuels and in resin manufacturing.

Formaldehyde

Columbia Analytical analyzes soil and water samples for formaldehyde and acetaldehyde by dinitrophenyl hydrazine (DNPH) derivatization and HPLC analysis following EPA Method 8315.

Monitored Natural Attenuation

Columbia Analytical provides analytical testing for monitoring intrinsic remediation/natural attenuation (MNA) at sites contaminated with petroleum hydrocarbons and other chemicals. Dissolved gases (including fixed O₂, N₂, CO, CO₂, and CH₄), light hydrocarbons, and hydrogen provide information on the progress of remediation. Anion and cation changes also reflect the rate of metabolic activity. The measurement of volatile fatty acids (lactic, the usual treatment stimulant, and its four fermentation products: pyruvic, butyric, propionic and acetic) is another activity monitoring suite. Total inorganic carbon (TIC) and a measure of the resulting inorganic carbon form CO₂, soluble organic carbon, and volatile organic compounds may also be performed to assess the reduction in hydrocarbon contamination.

Drinking Water Synthetic Organic Compounds (SOCs), Disinfection By Products (DBP) and Unregulated Contaminant Monitoring UCMR2

Columbia Analytical performs a full suite of drinking water procedures. Tests include drinking water SOCs and DBP testing, including bromate, chlorite, trihalomethanes, and haloacetic acids. Columbia Analytical is one of few laboratories that is certified for all tests under the UCMR2. We are certified for drinking water analysis in 19 states with plans for expansion on an as-needed basis. In addition, Columbia Analytical maintains the flexibility and versatility to perform non-routine determinations as dictated by specific project requirements. Examples are analyses for pharmaceutical and personal care products and endocrine disrupting compounds.

