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## INTRODUCTION

Columbia Analytical Services, Inc., established in 1986 and headquartered in Kelso, Washington, is a full-service analytical laboratory network. In 1997, Columbia Analytical became an employee-owned company. Our network is comprised of fixed laboratories, mobile laboratories and service centers located in Arizona, California, Florida, Hawaii, Massachusetts, New York, Texas and Washington. Our areas of expertise and services include:

- Environmental testing of air, water, wastewater, soil, sludge, solids, waste oil, solvents, hazardous waste, sediments and tissues;
- Micro-elemental analyses including those for C, H, N, O, S, metals and halogens on a wide variety of matrices;
- Process and quality control testing for many industries including pulp and paper, electronics, pharmaceutical and nutraceutical industries;
- Analytical method development;
- Sampling, field and mobile laboratory services;
- Technical consulting;
- Program management; and
- Data management.

Our staff consists of more than 400 employees, including chemists, biologists, computer scientists, technicians and support personnel. The diverse educational backgrounds and experience of our employees provide Columbia Analytical the comprehensive skills required by a modern analytical laboratory network. We take pride in our experience and professional dedication and are committed to providing the necessary resources to maintain and further develop our expertise to meet our customers' needs. Columbia Analytical provides analytical services to many different industries, including:

- |  |                                      |                     |
|--|--------------------------------------|---------------------|
| ▪ Aerospace  | ▪ Forest products                    | ▪ Pharmaceutical    |
| ▪ Automotive   | ▪ Manufacturers                      | ▪ Ports and Harbors |
| ▪ Chemical   | ▪ Microelectronics,<br>semiconductor | ▪ Pulp and paper    |
| ▪ Commercial/Solid Waste                             | ▪ Mining                             | ▪ Transportation    |
| ▪ Electronics  | ▪ Municipalities                     | ▪ Utilities         |
| ▪ Environmental &<br>Construction engineering        | ▪ Nutraceutical                      | ▪ Water Industries  |
| ▪ Federal government<br>agencies (DOD, EPA,<br>NOAA) | ▪ Petrochemical                      | ▪ Waste management  |
|  | ▪ Petroleum, oil, gas,<br>coal       |                     |

## **COLUMBIA ANALYTICAL LOCATIONS**

Columbia Analytical features over 125,000 combined square feet of facilities equipped with sophisticated analytical instrumentation. Each laboratory is designed and constructed to provide safeguards against cross-contamination of samples and is arranged by work function to enhance the efficiency of analytical operations. In addition, specialized areas are designed for efficient and safe handling of a variety of sample types. These include a sample receiving and shipping area, sample container preparation area, and refrigerated storage for samples, chemicals and standards. All Columbia Analytical locations offer either internal or contract courier/delivery services to deliver sampling kits and to receive samples. Deliveries outside of normal working hours, including weekends, are easily arranged. Columbia Analytical also serves international clients, having the necessary permits in place to accept foreign soils, water samples and tissue samples of both plants and animals.

Columbia Analytical laboratory locations are described below. A location map, including addresses and phone numbers, is provided on pages eight and nine of this section.

**Columbia Analytical/Kelso, Washington** is the largest laboratory in the network with over 46,000 square feet of laboratory and support staff space. The size of the laboratory, combined with its equipment and highly trained personnel allow this facility to provide enhanced services, for example, complex projects requiring analysis of large numbers of samples, those of difficult matrices, or those requiring low levels of detection.

Columbia Analytical/Kelso specializes in non-routine, complex analyses requiring a high degree of technical expertise. These special capabilities have allowed Columbia Analytical/Kelso to take part in a number of method development studies for the U.S. EPA and various state and industrial agencies. They have also held a number of direct EPA contracts under the U.S. EPA Contract Laboratory Program (CLP). Services are provided to a number of other federal government entities including the U.S. Army Corps of Engineers (ACOE), Navy and Air Force.

Included among the specialized procedures performed at the Kelso laboratory, are techniques that allow the ultra-trace determination of various constituents in difficult sample matrices. Investments have been made to develop systems for the preparation and analysis of sediment and tissue (i.e., plant and animal), as well as routine aqueous and soil samples. Much of the analytical chemistry performed at the Kelso laboratory is in

direct support of risk-based studies where routine environmental procedures are often insufficient to meet the project objectives.

Kelso has a dedicated Drinking Water laboratory, which was developed in order to service the growing need for clean water and the associated testing required to verify purity. Columbia Analytical has been performing drinking water testing since 1989 for inorganic and volatile organic compounds. The expansion into full service testing, including all of the regulated and unregulated compounds of concern allows Kelso to support clients nationwide.

A few of the more advanced environmental analytical techniques employed at Columbia Analytical/Kelso include specialized sample preparation, ultra-trace PAHs and alkylated homologs analyses, GC/ECD analysis for individual PCB congeners, isotope dilution for volatile and semivolatile organics, ultra-trace organotin speciation, pore water sample preparations and analyses, clean room techniques for ultra-trace metals, advanced chemical separations for ultra-trace metals, purge and trap atomic fluorescence for ultra-trace mercury, specialized inorganic testing (e.g., chromium reducible sulfur, microbially reducible iron, etc.), explosives testing, and numerous other procedures which have been developed for specific applications and projects. Columbia Analytical/Kelso can perform low-level tests for endocrine disrupting compounds and pharmaceutical and personal care product residues such as steroids, stimulants, antibiotics, antimicrobials, prescription and non-prescription drugs, insecticides, detergents, plasticizers, and fire retardants.

Columbia Analytical/Kelso is also FDA registered and provides the following services to the pharmaceutical and nutraceutical industries: monograph testing, process validation and engineering studies, analytical support for stability testing and method development and validation.

**Columbia Analytical/Simi Valley, California** is a nationally recognized, 20,000 square foot, air-testing laboratory that specializes in the analysis of ambient and indoor air pollution, stationary source emissions, process gas and industrial hygiene samples. The laboratory has performed testing on projects for clients in all the U.S. States, Puerto Rico, Guam and several other countries. In addition, Columbia Analytical/Simi Valley has provided analytical support to colleges and universities located throughout the United States. Columbia Analytical/Simi Valley is accredited by the American Industrial Hygiene Association.

Routine air tests performed by the laboratory include: analysis of volatile organic compounds (VOCs), speciated hydrocarbons and atmospheric gases in SUMMAÒ canisters, Tedlar bags and solid adsorbent media; analysis of speciated reduced sulfur compounds; analysis of carbonyl compounds (formaldehyde and other aldehydes) sampled with DNPH tubes and impingers; analysis of pesticides, PCBs, PAHs and other semivolatile compounds, collected using high volume and low volume polyurethane foam (PUF) and PUF/XAD-2 traps; analysis of phenols and cresols by HPLC; and determination of BTU heat content. The laboratory maintains an inventory of over 4,000 passivated stainless steel canisters of various sizes, low volume flow controllers, vacuum gauges, and a wide assortment of sampling media.

Columbia Analytical/Simi Valley performs a wide variety of specialized tests including the analysis of by-products of natural attenuation/intrinsic bioremediation; compliance testing for the pulp and paper industry; measurement of thermal decomposition products from aviation and hydraulic fluids for the aerospace industry; landfill compliance tests and material off-gas testing of building materials, commercial and consumer products. The laboratory also conducts product evaluations in a 1000 cubic foot testing room.

Our air laboratory maintains a separate offsite extraction laboratory. The purpose of this facility is to minimize the use of volatile solvents and other chemicals at the analytical laboratory facility, thereby enabling the laboratory to achieve low parts per billion or parts per trillion detection of volatile organic compounds in a contaminant-free environment.

**Columbia Analytical/Tucson, Arizona** has project management services, and offers fuels analyses, short holding time general chemistry parameters, and performs micro-analytical analyses (CHN, oxygen, sulfur, metals and halogens) on a wide variety of matrices for the pharmaceutical, electronic, chemical, and contract laboratory industries and for academic research. They specialize in working with difficult matrices such as those containing air-sensitive compounds or samples of very limited volume.

**Columbia Analytical/Houston, Texas** is a laboratory dedicated to high resolution analyses for analytes such as dioxin, furans and PCB congeners with five high-resolution gas chromatographs/high-resolution mass spectrometers (HRGC/HRMS). Houston performs these analyses on a variety of sample matrices: food products, food additives, PUF cartridges, XAD resins/filters, household dust, wipe samples, sediments, animal/marine tissues, paper, incinerator ash, soil, waste water, drinking water, and solid waste. Methodologies employed by Columbia Analytical/Houston include: EPA 8290, EPA 8280A, EPA 1668 (PCB congeners), EPA 1613B, EPA TO9 (ambient air), EPA 23 (stack

testing). Technical consulting on dioxin and other recalcitrant compounds is also available. New strides are being made with the addition of method CARB 429 for very low levels of polyaromatic hydrocarbons (PAHs) and the analysis for polybrominated fire retardant chemicals like the polybrominated diphenyl ethers (PDBEs).

**Columbia Analytical/Jacksonville, Florida** is a full service analytical laboratory providing testing for many industrial, government and consulting firms in the southeastern United States. The laboratory, as others in the network, also serves international clients, having the necessary permits to accept foreign water and soils into the country for analysis.

The laboratory's technical expertise includes the analysis of routine environmental samples, landfill samples, DOD projects and waste stream characterization. They also perform industry specific testing for pulp and paper manufacturers. Columbia Analytical/Jacksonville offers field sampling and local courier service. They provide a variety of customized reports, including electronic data deliverables and full CLP-like packages.

**Columbia Analytical/Rochester, New York** is a full service environmental laboratory. It carries certifications in most eastern and southeastern states. It has been NELAC certified in New York since the inception of the national approval program. In addition, Columbia Analytical/Rochester participates and has approval in various industrial company audit programs.

Columbia Analytical/Rochester provides routine and special analytical and field services to many large industrial and government clients. New York's Watershed Assessment Bureau has contracted with this facility for years to provide low-level nutrient and other water quality analysis on lakes and reservoirs around the state, including much of the watershed serving New York City. For this work, which also serves the data needs of the USGS and their network of water quality monitoring stations, the Rochester laboratory participates in the USGS semi-annual proficiency evaluation program.

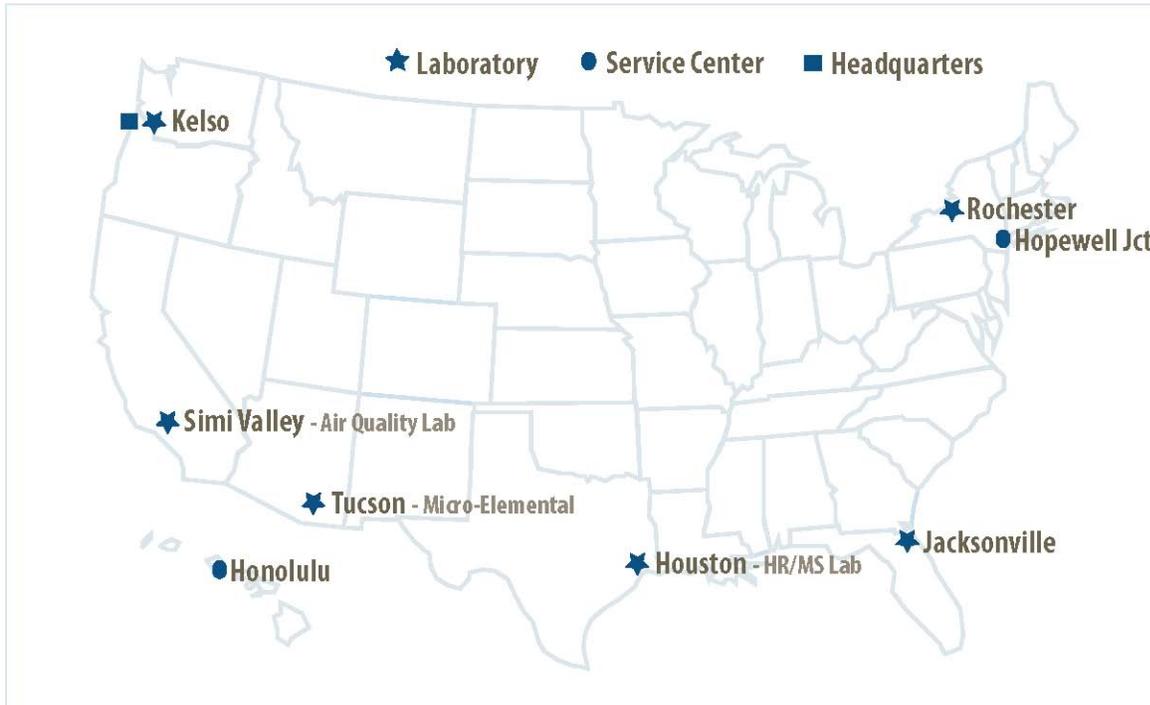
Through the addition of specialty tests, like the low-level method for perchlorate and many industry specific methods, Columbia Analytical/Rochester keeps evolving to meet the needs of their clients.

Nearly half of the testing in this facility is performed according to full CLP-like methodologies and reporting. The laboratory is certified in the rigorous state of New York ASP approval program. EDDs can also be supplied in many different formats.

Special turn-around requirements are also met at a higher frequency for repeat clients by reserving resources for this service. Field services are available for most routine collections and measurements.

Columbia Analytical/Rochester operates a service center in Fishkill, New York, where they manage a client's internal laboratory.

**Service Centers:** Columbia Analytical maintains client service centers in select geographic areas to support our clients' operations. The service centers provide sampling supplies, courier service, project management and other client services. Columbia Analytical currently has service centers in the Ormond Beach, Florida; Honolulu, Hawaii; Boston, Massachusetts; and Fishkill, New York areas.



**FULL SERVICE LABORATORIES**

**Florida**

9143 Philips Highway,  
Ste 200  
Jacksonville, FL 32256  
TEL 904.739.2277  
FAX 904.739.2011

**Washington**

1317 South 13<sup>th</sup> Avenue  
Kelso, WA 98626  
TEL 360.577.7222  
FAX 360.636.1068

**New York**

1 Mustard Street, Ste. 250  
Rochester, NY 14609  
TEL 585.288.5380  
FAX 585.288.8475

**SPECIALTY LABORATORIES**

**Texas (High Resolution)**

19408 Park Row, Ste. 320  
Houston, TX 77042  
TEL 713.266.1599  
FAX 713.266.0130

**California (Air Quality)**

2655 Park Center Dr., Ste. A  
Simi Valley, CA 93065  
TEL 805.526.7161  
FAX 805.526.7270

**Arizona (Micro-Elemental & Other Specialties)**

3860 S. Palo Verde Rd, Ste. 302  
Tucson, AZ 85714  
TEL 520.573.1061  
FAX 520.573.1063

**CLIENT SERVICE CENTERS**

**Boston, MA**

TEL 978.501.2735  
FAX 978.742.9897

**Fishkill, NY**

TEL 845.894.8544  
FAX 845.982.6167

**Honolulu, HI**

TEL 808.682.1564  
FAX 808.682.1768

**Ormond Beach, FL**

TEL 386.672.3539  
FAX 321.985.0345

## **QUALITY ASSURANCE PROGRAM**

Columbia Analytical's comprehensive quality assurance program ensures that the quality of the data produced by Columbia Analytical laboratories will be known and documented and that the data will be scientifically sound and legally defensible. Whether work is carried out in the laboratory or in the field, Columbia Analytical requires compliance with its written quality assurance and quality control (QA/QC) protocols and Standard Operating Procedures (SOPs). Each activity in the analytical process, including sampling, sample handling, analysis, data review, report production, and report delivery follow written SOPs and is critical to production of quality data. Columbia Analytical's Corporate Quality Officer and each laboratory's Quality Assurance Program Manager, have responsibility for Columbia Analytical's QA program. Their responsibilities include ensuring that sampling and analytical procedures are properly executed, sample custodial protocols are complete, QC procedures are implemented and recorded, and that only data of known and documented quality are reported. Each laboratory's QA program is described in its corresponding Quality Assurance (QA) Manual. QA Manuals are available for review upon request.

## **CERTIFICATIONS**

Columbia Analytical maintains a variety of certifications, accreditations, and approvals with federal and state agencies and with other regulatory programs. With seven laboratories located throughout the United States, Columbia Analytical is certified or accredited to perform environmental testing services in most states for air, drinking water, wastewater, groundwater, solid, hazardous waste, sediment and underground storage tank programs. Certificates are available upon request.

### **National Environmental Laboratory Accreditation Program (NELAP)**

The NELAC Institute (TNI), formed in 2006 combined the National Environmental Laboratory Accreditation Council (NELAC) and the Institute for National Environmental Laboratory Accreditation (INELA) to create a national accreditation program and a consensus organization to develop accreditation standards. This entity is made up individuals and organizations throughout the environmental monitoring community, including both government and private sectors. The standards development activities undertaken by TNI are the development of consensus authoritative standards that may be used for the purposes of laboratory accreditation. The standards are prepared and regularly revised entirely or in part by

committees of experts in chemistry, microbiology, toxicity, radiochemistry and engineering and other appropriately qualified individuals. The process used to develop these standards meets the requirements described in the Office of Management and Budget (OMB) Circular A119 for a developer of voluntary consensus standards incorporating the principles of openness, balance, due process, and consensus. The approach used for developing standards is described in Policies Governing Standards Development.

The National Environmental Laboratory Accreditation Program (NELAP) is the program that implements TNI standards. State and federal agencies serve as Accrediting Authorities, with coordination facilitated by EPA to assure uniformity. Accreditation by one NELAP Accrediting Authority is mutually recognized by the other state and federal Accrediting Authorities approved under NELAP. For a laboratory to be NELAP accredited, the laboratory must complete an application, pass an onsite inspection, demonstrate qualifications of analysts, and acceptably analyze two NELAP-recognized single-blind proficiency test studies per year for each field of testing for which the laboratory is accredited. All Columbia Analytical laboratories are currently NELAP accredited, with the exception of the Tucson laboratory. The Tucson laboratory's analytical capabilities are not covered under NELAP. .

**Our current certifications maybe found on our website:  
<http://www.caslab.com/Certifications>**

## **Performance Audits**

Columbia Analytical laboratories regularly participate in the analysis of inter-laboratory proficiency testing (PT) samples. PTs are samples of unknown concentration provided by an external accredited PT provider. Air PT samples are provided by American Industrial Hygiene Association (AIHA). PT studies are designed to evaluate all analytical areas of the laboratory. PT samples are analyzed for the following programs:

- Water supply (WS) samples for the SDWA
- Water pollution (WP) samples for the CWA
- Soil samples for the RCRA and CERCLA
- Water and soil samples for the UST program
- Other client and program specific PT studies

Scores for these various PT studies are available upon request.

## **Audits**

Each Columbia Analytical laboratory is audited by the various federal and state regulatory agencies that certify, accredit and approve the laboratory. Our clients and third-party evaluators frequently audit our laboratories as well. The laboratory performs corrective actions to any audit findings. Columbia Analytical welcomes external audits as an opportunity to showcase the QA program.

Additionally, Columbia Analytical has an internal audit program. System and data audits are routinely performed by the Chief Quality Officer and by each laboratory's QA Program Manager. Appropriate corrective actions are performed to any audit findings.

## **CLIENT SUPPORT SERVICES**

Columbia Analytical serves clients with a broad, in-depth range of management and technical support capabilities. This section describes our client support services including, project management, program management and technical services.

### **Project Management**

All projects are assigned to a senior-level, non-line project chemist. Each project chemist is responsible for coordinating all phases of that project and has the authority to commit the necessary resources to meet project objectives and requirements. The project chemist ensures that technical, financial and scheduling objectives are met. The Columbia Analytical project chemist is the direct liaison with the client's project manager, and is the major contact for current as well as future projects. Their duties encompass many aspects of our work including:

- Client communication
- Technical project set-up
- Bottle order and delivery
- Courier services
- Data report review
- Report delivery
- Technical interpretation

### **Program Management**

Columbia Analytical provides program management services for a number of clients who have regional or national geographic presence. These services allow for organization of our clients' inter and intra-laboratory work and provide a structured approach to managing our client's analytical program. Columbia Analytical's program management services include business, administrative, technical and operational support.

These services are tailored to meet our client needs. In some cases, we have provided the framework to allow our clients to easily order services for a specific regulatory program. This allows different client locations to take advantage of economies of scale and ensures each location a uniform, dependable level of service designed to meet specific regulatory state and local agency requirements. In other cases, we have actually taken on all

management aspects of a client's analytical program, including personnel, equipment and materials. The following are examples of our program management services:

**Client #1:** Since 1992 Columbia Analytical had been providing analytical and sampling services for a large electronics client. In 1998, we began providing these services nationally, using a national program manager to manage the account with assistance from designated laboratory project managers. These services expanded as we entered into a Strategic Relationship Agreement with this client that allows our laboratories to work with their clients and partners. In 2000 an extension of our working relationship began when we entered an agreement to manage this client's employees at one of their internal laboratories.

**Client #2:** Columbia Analytical has long been recognized for its technical expertise in providing services to a number of specific industries, one of which is the pulp and paper industry. We were among the first laboratories in the nation to develop the methods required for testing organic compounds under the Cluster Rule regulations and participated in the method validation studies for those methods as well as many others over the years. In 2001, as a result this commitment to this industry, we were awarded a contract to provide testing services for the Cluster Rule regulations to all locations of a large pulp and paper company. Upon review of our client's permits, our knowledge of the Cluster Rule regulations allowed us to make suggestions for lowering costs. Due to the number of locations involved, we were also able to pass on volume discounts. As part of our services for this contract we have facilitated the exchange of information between various state regulatory agencies and the state laboratory certification agencies to ensure that the results of these tests are compliant with regulatory agency requirements. As a result of our efforts on behalf of this client we were awarded an additional national contract for all of the analytical work in support of this client's remediation projects throughout the United States.

## **FIELD PRODUCTS AND SERVICES**

In response to clients' needs, each Columbia Analytical location has developed varying levels of field sampling and field chemistry capabilities. This flexibility allows us to offer a complete service package, from sampling to data delivery.

Both in-house and contracted sampling crews are fully trained and OSHA certified for work on hazardous waste sites. Specialties include groundwater monitoring, soil coring to depths of 6 feet and automated effluent sampling.

## Field Products

### Passive Diffusion Bag (PDB) Samplers for the Collection of Groundwater Samples for Volatile Organics Analysis

Columbia Analytical has been granted a license to manufacture, use and provide the bags by the US Geological Survey (USGS) and The General Electric Company (GE), both co-patent holders on the product (US #5,804,743). The downhole passive water sampler and method of sampling was invented by Don Vroblesky (USGS) and Thomas Hyde (GE).

PDB Samplers are made of low-density polyethylene (LDPE), which acts as a semipermeable membrane. Volatile Organic Compounds (VOC's), excluding certain ketones, ethers and alcohols diffuse readily through the membrane. Equilibrium is established between the VOCs in the bag and those in the groundwater. The PDB Sampler, in the shape of a long cylindrical tube, is filled with analyte-free water. It's available in both field-ready and field-filled versions. It is simple to deploy, eliminates the collection and disposal of purged water and significantly reduces the cost of sampling. Upon retrieval, usually 14 days after deployment, bags are opened to fill vials and returned to the laboratory for analysis.



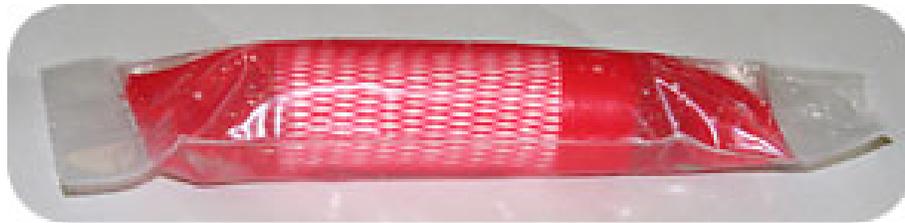
*PDB and hanging assembly*

## Rigid Porous Polyethylene Samplers (RPPs) for the Collection of Groundwater Samples for Water Soluble Analyte Analysis

Columbia Analytical also manufactures another passive sampler based on the design and research of Don Vroblesky of the USGS. The Rigid Porous Polyethylene sampler (RPPs) is made of thin sheets of foam-like porous polyethylene with pore sizes of 6-20 microns. When completely filled with water the pores allow a water-water interface, facilitating the equilibrium of water-soluble analytes in the aquifer adjacent to the well screen with the deionized water of the RPP.

Primary sampling applications for the RPPS are for all water soluble analytes, like inorganic anions and cations, metals, MEE parameters, 1,4-dioxane, MTBE, hexavalent chromium, explosives, perchlorate and dissolved gases. They are also very useful in deep wells where submersible pumps may not function

Like the PDB, the RPP is simple to deploy, eliminates the collection and disposal of purged water and significantly reduces the cost of sampling.



*RPP ready for deployment and package in disposable water-filled sleeve for shipping*

Additional information about both of these samplers and passive sampling in general may be found on the Interstate Technical Regulatory Council's (ITRC) web site at [www.ITRCweb.org](http://www.ITRCweb.org).

### **Field Services**

Columbia Analytical performs field sampling services in the Northeast, Southeast and Southwest. Field sampling capabilities include groundwater monitoring, clean sampling techniques, soil coring and automated effluent sampling.

## **ANALYTICAL PROGRAMS**

### **Analytical Services**

Columbia Analytical's core business is analytical services, representing a variety of industries. We provide routine and specialty testing for the environmental industry and assist our manufacturing clients with process and product testing services. Throughout the years, our chemists have gained valuable experience working on projects related to the aerospace, chemical, electronics, pulp and paper, petroleum, marine, transportation and waste management industries.

Our comprehensive services cover routine analyses and specialty testing services such as: low-level environmental analysis of air, water, soil, sediment, tissue; indoor air, landfill gas and source testing determinations; microbiology; industrial hygiene; and biological toxicity screening. Our laboratories perform work under multiple federal and state certification programs and national accreditation programs.

#### Air Quality Testing:

Columbia Analytical provides air quality testing and industrial hygiene services for a wide range of clients and industries through its dedicated Air Quality laboratory. The lab is accredited by the American Industrial Hygiene Association (AIHA) for the analysis of organic compounds and participates in the quarterly Proficiency Analytical Testing (PAT) program administered by the AIHA.

The Air Quality laboratory specializes in the analysis of volatile and semi-volatile compounds in samples such as ambient air, landfill gas, soil gas, industrial source emissions, odor analyses and indoor air quality investigations. This facility analyzes whole air samples, as well as those requiring solvent or thermal desorption. Other services available include material emission/off-gassing studies and product evaluations. The laboratory has a 1000-cubic foot testing room and one-liter simulated environmental chambers available for product testing. Recent projects have included evaluations of the performance of residential air purifiers, monitoring of workplace exposures and IAQ/odor evaluations.

### CERCLA and Remedial Investigation and Feasibility Studies (RIFS):

Since 1986, Columbia Analytical has performed chemical analyses in support of remedial investigation and feasibility studies (RI/FS), risk assessment, natural resource damage assessments, remedial activities for Superfund sites and related programs. Many of these programs have required CLP methodologies and deliverables for both organic and inorganic parameters on large numbers of air, water, soil and sediment samples. Analytical parameters have included a wide spectrum of methodologies. In some cases, standard operating procedures were written as part of the quality assurance project plan, which outlines project organization and responsibilities, data quality and sample management objectives, stringent quality control, and performance and system audit procedures. Columbia Analytical has developed special protocols for analytical, quality control, and sampling procedures for specialized methodology of non-routine matrices needed to support project goals. Columbia Analytical can complement the site project team by participating early in the planning stages and by providing technical advice to all involved including the consultants, potentially liable parties, and governing agencies.

### Clean Water Act:

Columbia Analytical performs regular monthly National Pollution Discharge Elimination System (NPDES) monitoring for a number of municipalities, counties, and government entities, as well as for industrial and mining clients. Due to intense regulatory scrutiny, these projects have required close attention to monthly trends so clients are alerted to any change that might affect them. The deadlines imposed by the permit agency require timely delivery of data to avoid fines and penalties.

Most Columbia Analytical laboratories perform drinking water tests, primarily for the local areas and states surrounding each laboratory location. We have a dedicated drinking water laboratory department at our Kelso facility with multiple states certifications that can provide full service drinking water testing including regulated and unregulated compounds and UCMR 2 analyses. We also provide the items necessary to take samples. Columbia Analytical can provide the items required for storm water analysis in a convenient shipping container, which includes the bottles, ice packs, sampling instructions, chain of custody and shipping documentation.

### Government Projects:

Columbia Analytical has worked for many Department of Defense (DOD) branches as well as other federal and state government agencies both directly and indirectly. Laboratory procedures have covered the full analytical spectrum, including trace metals, toxicity, trace organics and classical wet chemistry techniques. Our services have included the development of specialized techniques for petroleum products, ultra-trace determinations of metals using ICP-MS instrumentation, ultra-trace determinations of hazardous organics in sediments using GC/MS Selected Ion Monitoring (SIM), ordnance testing. We have assisted with development, specification and implementation of electronic data delivery with adherence to reporting requirements of the ACOE, Navy (NFESC), Air Force (AFCEE), and their contractors, including adherence to the most current version of the Quality Systems Manual for Environmental Laboratories (QSM) and the DOD Perchlorate Handbook. All of our laboratories are DOD certified, except for our Tucson Laboratory.

Columbia Analytical became a participant in the U.S. EPA's Contract Laboratory Program's (CLP), Regular Analytical Services (RAS) and the Special Analytical Services (SAS) in 1988. One contract involved analyzing water, soil, and waste samples from a wide variety of U.S. EPA Superfund sites throughout the United States for CLP metals and cyanide. The services under the SAS contracts included the following: method development, round-robin method validation, special low-level techniques, difficult matrix analyses, rapid turnaround response, and other areas not routinely included in the RAS CLP. The RAS and SAS contracts required meticulous adherence to quality assurance/quality control as well as strict data documentation and reporting procedures, which have been adapted for usage for all analytical work performed at Columbia Analytical. Data package deliverables include special hardcopy and electronic reporting formats to meet EPA requirements.

### Low Level Sediment and Tissue Analyses:

Columbia Analytical routinely performs chemical analyses in support of sediment and dredge disposal projects. These studies include the analysis of hundreds of sediment, tissue and water samples for a variety of trace metals, organics, and conventional chemicals of concern. Project work involves the development and validation of specialized analytical techniques in order to meet the low-level detection limits and difficult matrix requirements of sediment analysis. All data generated under these projects must meet specific quality control and stringent data deliverable requirements. Data is reported with

both hard copy and diskette deliverables, and in some cases, include formats required by the EPA CLP program.

#### Pulp and Paper Industry Testing:

Columbia Analytical has extensive experience related to the pulp and paper industry. Some of our technical staff, prior to joining Columbia Analytical, have direct industry experience related to product, process and environmental applications.

We provide FDA paper testing services in our Jacksonville laboratory. Our Kelso laboratory was one of five laboratories that contributed to the method validation studies for Cluster Rule Procedures. These studies were sponsored by the EPA and NCASI (National Council of the Paper Industry for Air and Stream Development, Inc.). Columbia Analytical is one of the few laboratories performing the NCASI Method 99.02, Impinger/Canister Source Sampling Method for Selected HAPs at Wood Products Facilities. We continue to work with NCASI to develop other industry specific analytical procedures.

#### RCRA Characteristic Testing and Waste Profiles:

Waste designation testing has been performed for numerous industrial clients concerned about proper classification and disposal of industrial waste. Using federal and state specific procedures, waste classification testing includes extraction procedure toxicity, toxicity characteristic leaching procedure (TCLP), ignitability, corrosivity, reactivity, PCBs, organic halogens, F-list solvent scans, and persistent hazardous materials.

#### Dioxin and other high resolution testing:

Columbia Analytical/Houston features over 5,000 square feet equipped with five sophisticated high resolution mass spectrometers (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.

With the addition of two new Waters Micromass AutoSpec-Ultima HRMS, considered to be the optimal choice for ultra low-level trace detection applications such as the analysis of dioxins, furans, PCB congeners and polybrominated diphenyl ethers (PBDEs), Columbia Analytical/Houston is achieving detection limits of 10-100 times lower than with the older instruments and are among the lowest in the industry.

### Pharmaceutical and Nutraceutical Testing:

Columbia Analytical provides analytical testing services to the pharmaceutical, biotechnology, and environmental industries. To ensure regulatory compliance, Columbia Analytical/Kelso facility is FDA registered and cGMP compliant. Columbia Analytical's comprehensive quality assurance and ethics programs ensure that the data produced by all Columbia Analytical laboratories will be of known quality, scientifically sound, legally defensible and accurately documented. Our expertise and services include the following:

- **Monograph Testing:** USP/NF, EP, JP, BP, AOAC, and ACS monograph testing. This includes raw material and final product testing. Examples of this include Organic Volatile Impurities testing by USP <467>, Heavy Metals by USP <231>, and Water Determination by USP <921>. Columbia Analytical can also complete testing using client supplied methodology.
- **Method Development and Validation:** Our professional scientists have extensive experience in analytical chemistry and can provide method development and validation for pharmaceutical testing. Methods are validated to current ICH guidelines.
- **Engineering Studies/Process Validation:** Columbia Analytical scientists are accustomed to non-routine testing and have the knowledge and resources to solve your analytical problems. Examples of this may include analytical support for cleaning studies or manufacturing processes.
- **Stability Testing -** Columbia Analytical provides analytical support to your stability study testing. This may include assay testing, physical testing, and impurity and degradation product monitoring. This also includes development and validation of stability indicating assays.

### UST/AST Programs & Forensics:

Columbia Analytical performs analyses of samples collected around underground and aboveground storage tanks for solvent content and for identification of petroleum hydrocarbons under the regulations of various state and federal agencies. We have also analyzed underlying soils to assess tank leakage and performed soil gas investigations to pinpoint the extent of product release. Columbia Analytical has senior chemists trained in the aspects of petroleum hydrocarbon forensics. In addition to overseeing specific

forensics testing procedures, our chemists also provide technical consulting and litigation support services.

We are currently providing specialized services to those working on the gulf oil spill, including analysis for the dispersants used and forensic analyses of oily samples of tissue, water, air and soil.

## **Technical Services**

Columbia Analytical offers a variety of technical services to support our clients' needs. These include method development, analytical scope consulting, forensics, litigation support and electronic data management support. Our Technical Services Group is comprised of an interdisciplinary team of specialists, experts in fields such as: air testing services, forensics, electronics industry, pulp and paper industry, marine toxicology, risk assessment, and information technology.

### Technical Consulting

The experience and technical depth of our laboratory personnel enables Columbia Analytical to offer our clients a variety of technical consulting services. Our chemists are routinely asked to review historical data sets to provide a technical evaluation. We also assist in the development of sampling, analytical and quality assurance project plans. Some of our senior technical staff are available to provide litigation support and expert witness services. Our operations are able to provide on-site laboratory services when necessary, which can include laboratory design consulting and recommendations.

### Technology Development

Columbia Analytical is very active in technical development, exploring innovative business approaches and technologies that will lead Columbia Analytical and our clients into the future. This program includes our information technology group, which focuses on the automation of laboratory systems and information delivery to its customers.

Columbia Analytical prepares and conducts seminars and technical presentations on subjects covering many areas for which professional continuing education credits are available. Client-specific seminars are also available upon request.

## **DATA MANAGEMENT**

Columbia Analytical has successfully met the data management requirements of a wide variety of projects for both government and private sector clients. Included in this section is a description of our information system platform and electronic data deliverables.

### **System Platform**

All Columbia Analytical laboratories operate in a server/local area network (LAN) configuration. Columbia Analytical has standardized on Microsoft® (MS) Windows® applications (i.e., Word®, Excel®, Access®, and MS Exchange®).

### **Laboratory Information Management System (LIMS)**

All Columbia Analytical facilities are in various stages of implementing and being linked via a laboratory information management system (LIMS) that utilizes an Oracle® database environment to track our samples from time of receipt and allow tracking across the Columbia Analytical Laboratory Network. Samples are logged into the LIMS from the information provided on the Chain of Custody, including holding time information, project turnaround time, required QA/QC, report due dates, etc. Client specific information can be pulled up during login and associated to specific projects for that client. Information for the job is passed onto the laboratory department electronically and provides a header set of information for analyses and reporting. As each laboratory completes the analyses of samples on any project, the information is entered into the LIMS, updating its status.

Each day, reports are generated for the individual department within the laboratory. The reports keep everyone apprised of the status of all samples and projects in-house. The LIMS system has the capability of monitoring multiple due dates.

### **Data Acquisition**

Analytical instruments at Columbia Analytical produce files that are imported into various data reduction and validation tools, e.g. Stealth, MARRS, and others. This data is then passed on via a “superset” file to Columbia Analytical's proprietary program called EDDGE (Electronic Data Deliverable Generator). The EDDGE program normalizes the data and translates necessary Columbia Analytical internal valid values into Client specific valid values.

As described above, all Columbia Analytical's laboratory data is acquired directly to a local area network disk or locally and then transferred to a centralized acquisition server from which all reporting takes place. There are few tests that require manual entering of data because the test itself cannot be automated, i.e. % moisture. Once all data is gathered, the hardcopy report is generated, after which an electronic data deliverable (EDD) generating superset database is produced; the EDD is then generated, so strictly speaking, both the EDD and the hard copy reports are generated from the same data source. However, if there are specific fields required in the EDD or variations required by the client that are not part of the hardcopy report, those fields are added after the hardcopy report is generated. Currently, there are some fields required in certain EDDs that are not presently part of our central database. These include COC numbers and, in some labs, "sample prep time" or "time-extracted". Until these fields can be added to our central database, they must be entered manually.

In all cases the hardcopy report and EDD are reviewed against each other according to a strict written protocol which is available to our clients.

### **Data Archiving**

Columbia Analytical's laboratory data is acquired directly or locally and then transferred to the centralized acquisition server. All data is eventually moved to the centralized data acquisition server for reporting and archiving.

Differential Backups are performed once per day, with full backups performed once per week. Every other week, a full backup is archived, alternating on and off site.

### **Electronic Data Deliverables (EDDs)**

Columbia Analytical offers a range of EDDs. We generate a number of DOD (Army, Navy, and Air Force) deliverable formats to support data transfer into large relational database management systems. In these cases, the data structures and fields are rigidly specified. We also work closely with our commercial clients to produce electronic data formats compatible with their systems. Columbia Analytical currently supports more than 150 different EDD formats. Utilizing a number of proprietary and other database tools, such as MS Access®, FoxPro®, Excel®, and Visual Basic®, our data management specialists are able to easily produce both EDDs and hard-copy reports. Included below are some of the EDD formats Columbia Analytical supports:

<b>AdaPT Florida</b>	Automated Data Processing Tool (Laboratory Data Consultants) for the State of Florida Department of Environmental Protection (DEP)
<b>ADAPT/ADR (6.2 &amp; 8.1)</b>	Automated Data Processing Tool (Laboratory Data Consultants)
<b>ADEQ</b>	Arizona Department of Environmental Quality
<b>ERPIMS</b>	Environmental Resources Program Info
<b>ERPIMS Enhanced</b>	Environmental Resources Program Info
<b>AZ DEQ</b>	Arizona Department of Environmental Quality
<b>COELT 1.2/EDCC 1.2i</b>	U.S. Army Corps of Engineers (USACE) data loading tool
<b>EPA/USACE SEDD</b>	Staged Electronic Data Deliverable (US Army Corps of Engineers)
<b>EPA Region (Regions 3, 4, &amp; 5)</b>	Environmental Protection Agency
<b>ERPIMS</b>	Environmental Resources Program Information Management System
<b>ERPTools</b>	Developed by AFCEE
<b>EQUIS Earthsoft</b>	Earthsoft Environmental Quality Information System ITEMS
<b>Florida DEP</b>	Florida Department of Environmental Protections
<b>GeoTracker/SWRCB</b>	State Water Resources Control Board/California Environmental Protection Agency
<b>GISKey</b>	GIS/Solutions
<b>Navy Clean</b>	Comprehensive Long Term Environmental Action Navy
<b>NEDD NIRIS</b>	Naval Electronic Data Deliverable Naval Installation Restoration Information Solution
<b>NEDTS</b>	Navy Environmental Data Transfer Standard
<b>NJDEP</b>	New Jersey Department of Environmental Protection
<b>NYSDEP</b>	New York State Department of Environmental Conservation
<b>SEDD 2A</b>	Staged Electronic Data Deliverable Generator Tool
<b>SEDQUAL</b>	Sediment Quality Information System ( Washington State Dept of Ecology)
<b>SWFWMD</b>	Southwest Florida Water Management District
<b>TCEQ</b>	Texas National Commission. Of Environmental Quality
<b>WA EIM</b>	Washington Environmental Information Management System
<b>WADOH-DW</b>	Washington State Department of Health (DOH)

### **E-mail and Data Transfer**

All Columbia Analytical facilities are linked via Microsoft Exchange. Our data can be electronically transferred via diskette, direct modem transfer to our client's host, or through the Internet.