Qualifications Statement
for the
Weston
Analytical Laboratory

Lionville,
Pennsylvania
# LABORATORY QUALIFICATIONS STATEMENT

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I. INTRODUCTION
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The WESTON East Coast Analytical Laboratory is established in a new $3 million facility in Lionville, Pennsylvania. The laboratory is completely separate from all other WESTON facilities. Its purpose is to provide routine and custom analytical chemical services to industry, regulatory agencies, consultants, and other laboratories.

The laboratory is certified by the U.S. Environmental Protection Agency (No. 38009), the U.S. Army Toxic Hazardous Materials Agency (USATHAMA), and several state agencies to perform a variety of analyses of air, water, wastewater, and soil samples. The laboratory participates in the EPA Contract Laboratory Program for organic analysis of environmental samples.

The laboratory maintains confidentiality of client identification, project scope, and analytical data as a standard operating practice. Formal confidentiality agreements are available to prospective clients as required.

The laboratory staff possesses specific expertise in:

- Inductively coupled argon plasma.
- Atomic absorption.
- Gas chromatography/mass spectrometry (GC/MS).
- Gas chromatography.
- Ion chromatography.
- High pressure liquid chromatography.
- Thin layer chromatography.
- Biological analysis.
- Wet-chemistry analysis.
- Analytical methods development.
II. FACILITIES DESCRIPTION
II. FACILITIES DESCRIPTION

The analytical laboratory is equipped to perform over 200,000 environmental analyses annually. Figure 1 is a floor plan of WESTON's laboratory. The laboratory contains more than 9,000 square feet of working space including 1,600 linear feet of bench space apportioned into several contiguous rooms, including a temperature/humidity-controlled room, a controlled substance facility, and over 3,000 cubic feet of refrigerated space for sample storage.

The laboratory is physically divided into separate work areas to facilitate sample throughput. These areas include:

- Sample logging and refrigerated storage.
- Sample preparation and extraction.
- Glassware preparation.
- Organic extraction.
- Standards preparation.
- Biological laboratory.
- Wet chemical laboratory.
- Hazardous materials laboratory.
- Instrumentation laboratories.

The three main instrumentation laboratories are:

- Organic Laboratory
- Inorganic Laboratory
- GC/MS Laboratory

Each of the three areas has a separate heating, ventilation and air conditioning system, observation windows, and adequate space for expansion.

Nondestructive gas chromatographic detectors, GC autosampler flush solvents, and GC/MS rotary pumps are vented out of the instrumentation laboratories through charcoal filters. The organic sample preparation laboratory has multiple hoods used for sample preparation and extraction. The outlets of the condensers of all Soxhlets and continuous extractors are vented out of the laboratory by a specially constructed fume exhaust system.
FIGURE 1 WESTON LABORATORY FLOOR PLAN
Metals analyses are performed in the inductively coupled plasma laboratory. A copper screen surrounds the room so that stray low-level radiation does not reach instruments in adjacent laboratories.

A hazardous materials laboratory has been specially designed to handle samples containing high concentrations of contaminants such as explosives, dioxin, etc. This laboratory area has a separate air-handling system; walls and flooring without seams, which can be washed down and the washwaters segregated; showers for employees; and nonsparking surfaces. The WESTON laboratory has handled and analyzed samples containing high concentrations of explosives.

A computer-based Data Management and Control System (DMCS) provides the management and reporting capabilities necessary to effectively manage and process, with minimal time and effort, the data typically dealt with in the analytical laboratory. Included are:

- Data on the analytical techniques used, such as procedural definition/standard, sensitivity, and unit costs.
- Data on the samples processed, such as sample number, analyses to be performed, and quality control requirements data received, holding time and date which the report is due.
- Data on the client, including purchase order number, client billing address, etc.

The DMCS utilizes a general data base management system approach, resident on a disk-based microcomputer system. The system provides standard data entry, data edit and verification, and data retrieval and reporting functions, as well as backlog reporting, invoice preparation, customer report preparation, and archiving of completed sample data.

Utilization of the DMCS microcomputer system enables the laboratory supervisor to effectively manage the analytical production of the laboratory. The archiving function of the system permits completed sample data to be transferred to a host computer for further processing and quality assurance data analysis. Reporting and invoicing are also expedited with minimal clerical requirements.

Additionally, the combined data management systems can interface with the Environmental Protection Agency's oil and hazardous materials technical assistance data system (OHMTADS), as well as other client data base systems.
III. EQUIPMENT LIST
### III. EQUIPMENT LIST

**ANALYTICAL INSTRUMENTATION AVAILABLE AT WESTON LABORATORY**

LIONVILLE, PENNSYLVANIA

<table>
<thead>
<tr>
<th>Type and Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Pressure Liquid Chromatograph - Purchased in 1980</td>
<td>2</td>
</tr>
<tr>
<td>Perkin-Elmer Model LC-75, Series 211, continuously variable wave-length detector</td>
<td></td>
</tr>
<tr>
<td>Ion Chromatograph - Purchased in 1984</td>
<td>1</td>
</tr>
<tr>
<td>Dionex Model 2020i</td>
<td></td>
</tr>
<tr>
<td>Atomic Absorption Apparatus - Purchased in 1975</td>
<td>2</td>
</tr>
<tr>
<td>Perkin-Elmer Model 503 with cold vapor mercury attachment, background correction</td>
<td></td>
</tr>
<tr>
<td>Perkin-Elmer Model 5000 with graphite furnace and background correction</td>
<td></td>
</tr>
<tr>
<td>Perkin-Elmer Model 5000 flame/graphite furnace with Zeeman background correction, auto sampler - Purchased in 1985</td>
<td>1</td>
</tr>
<tr>
<td>Technicon Automatic Analyzer - Purchased in 1984</td>
<td>1</td>
</tr>
<tr>
<td>Gas Chromatograph/Mass Spectrophotometer</td>
<td></td>
</tr>
<tr>
<td>Finnigan Model 5100, equipped with electron ionization and chemical ionization source; capillary column system; INCOS data system; positive and negative ions electron multiplier detector; all glass jet separator and direct transfer line interface for capillary column system; with stand alone computer for data reduction and reporting - Purchased in 1983, 1984</td>
<td>2</td>
</tr>
</tbody>
</table>

November 1985
<table>
<thead>
<tr>
<th>Type and Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finnigan OWA 1020 GC/MS - electron impact quadruple mass spectrometer, equipped with packed and capillary column injectors; INCOS data system; EPA, NIH, and special EPA-priority pollutant mass spectra library - Purchased in 1980</td>
<td>1</td>
</tr>
<tr>
<td>Finnigan Model 4610B GC/MS - electron impact quadruple, equipped with packed and capillary column capability; INCOS data system; EPA/NIH, mass spectral library - Purchased in 1985</td>
<td>1</td>
</tr>
<tr>
<td>Total Organic-Halide Analyzer - Purchased in 1984</td>
<td>1</td>
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<tr>
<td>Dohrmann DX-20 Analyzer System equipped with microcoulometric analyzer</td>
<td></td>
</tr>
<tr>
<td>Inductively Coupled Plasma Apparatus - Purchased in 1978</td>
<td>1</td>
</tr>
<tr>
<td>Perkin-Elmer ICP/5000 system equipped with automatic ignition system, automatic tuning, data system automatic sampler</td>
<td></td>
</tr>
<tr>
<td>Chromatograph Integrators</td>
<td>2</td>
</tr>
<tr>
<td>Perkin-Elmer (Spectra-Physics) Model 2 calculating integrator</td>
<td></td>
</tr>
<tr>
<td>Hewlett-Packard Model 3390A chromatographic integrator</td>
<td></td>
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<tr>
<td>Organic and Total Carbon Analyzers</td>
<td>2</td>
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<tr>
<td>Ionics Model 1270 TOC and TOC analyzer equipped with automatic sampler and infrared analyzer - Purchased in 1975</td>
<td></td>
</tr>
<tr>
<td>Dohrmann Envirotech Analyzer Model DC-50 - Purchased in 1984</td>
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<tr>
<td>Gas Chromatographs Detectors</td>
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</tr>
<tr>
<td>Flame Ionization Detectors - Purchased in 1980</td>
<td>2</td>
</tr>
<tr>
<td>Hewlett-Packard No. 18801B</td>
<td></td>
</tr>
<tr>
<td>Type and Model</td>
<td>Quantity</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Electron Capture Detectors - Purchased in 1980</td>
<td>2</td>
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<tr>
<td>Hewlett-Packard No. 18803B</td>
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<tr>
<td>Analog Technology Corporation Model 140A</td>
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<tr>
<td>Hall Electrolytic Conductivity Detectors - Purchased in 1983, 1984</td>
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<tr>
<td>Tracor Model 700A</td>
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<tr>
<td>Photoionization Detector - Purchased in 1984</td>
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<tr>
<td>HNV Model PI-52-02</td>
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<tr>
<td>Flame Photometric Detector - Purchased in 1983</td>
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<tr>
<td>Tracor Model 12003</td>
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<tr>
<td>Nitrogen Phosphorus Detector - Purchased in 1983</td>
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<tr>
<td>Hewlett-Packard Model 18847A/8A</td>
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**Gas Chromatographs**

<table>
<thead>
<tr>
<th>Type Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewlett-Packard Model 5880 with level 4 programmable keyboard, alkaline flame ionization NP detector, 2 FID detectors, and electron capture detector. Model 7672A auto-sampler for continuous sample analysis - Purchased in 1982</td>
<td>1</td>
</tr>
<tr>
<td>Hewlett-Packard Model 5880 with level 4 programmable keyboard, flame photometric, FID, and 2 electron capture detectors. Model 7672A auto-sampler for continuous sample analysis - Purchased in 1982</td>
<td>1</td>
</tr>
<tr>
<td>Hewlett-Packard Model 5880 with level 4 programmable keyboard, Hall Model 700A electrolytic conductivity detector, FID, and ECD - Purchased in 1983</td>
<td>1</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Type and Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewlett-Packard Model 5840A gas chromatograph equipped with flame ionization</td>
<td>1</td>
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<tr>
<td>detector; electron capture detector; automatic sampler; capillary column</td>
<td></td>
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<tr>
<td>systems; and automatic integrator, Model 7672A auto-sampler - Purchased in 1980</td>
<td></td>
</tr>
<tr>
<td>Hewlett-Packard Model 5880 with level 4 programmable keyboard, Hall Model 700A</td>
<td>1</td>
</tr>
<tr>
<td>electrolytic conductivity detector, and FID. Tekmar LSC-2 Purge and Trap</td>
<td></td>
</tr>
<tr>
<td>concentration with (Tekmar Model ALS) 10 sample auto-sampler - Purchased in 1984</td>
<td></td>
</tr>
<tr>
<td>Perkin-Elmer SIGMA 2000 completely automated headspace analyzer with flame</td>
<td>1</td>
</tr>
<tr>
<td>ionization and electron detectors - Purchased in 1984</td>
<td></td>
</tr>
<tr>
<td>Analytical Instrument Development Portable Model 511 with flame ionization</td>
<td>1</td>
</tr>
<tr>
<td>detector; dual column; and sampling, column switching, and back-flush valves -</td>
<td></td>
</tr>
<tr>
<td>Purchased in 1983</td>
<td></td>
</tr>
<tr>
<td>Perkin-Elmer Model SIGMA3B isothermal and temperature programmed auto sampler</td>
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<tr>
<td>for headspace analysis, packed and capillary column capability, automatic</td>
<td></td>
</tr>
<tr>
<td>integrator - Purchased in 1978</td>
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<tr>
<td>Purge and Traps</td>
<td>5</td>
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<tr>
<td>Chromalytics Model 1047 concentrator - 1980</td>
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<tr>
<td>Tekmar Model LSC-2 - 1982</td>
<td>1</td>
</tr>
<tr>
<td>Tekmar Model ALS (Automatic Liquid Sampler) - Purchased in 1983, 1984</td>
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<tr>
<td>Spectrophotometers - Purchased at various times</td>
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<tr>
<td>pH Instruments - Purchased at various times</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Type and Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Ion Analyzer</strong> - Purchased in 1978</td>
<td>1</td>
</tr>
<tr>
<td>Orion Model 901 pH/ion meter with Model 658</td>
<td></td>
</tr>
<tr>
<td>switch and various specific ion electrodes</td>
<td></td>
</tr>
<tr>
<td><strong>Liquid Scintillation Counter</strong> - Purchased in 1983</td>
<td>1</td>
</tr>
<tr>
<td>Tracer Analytic Beta Trac 6895 microprocessor-based. It features automatic DPM, ESR, SCR, and is complete with printer and an internal memory.</td>
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</tr>
</tbody>
</table>

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IV. QUALITY ASSURANCE/QUALITY CONTROL
IV. QUALITY ASSURANCE/QUALITY CONTROL

WESTON has adopted a formal laboratory quality assurance/quality control program. Laboratory quality control is maintained from sample collection through ultimate disposal, and is facilitated by the computerized Data Management and Control System (DMCS). With advance approval, special project-specific quality assurance/quality control plans can be prepared and implemented to meet the specific requirements of project or client.

The standard quality control procedures used in the WESTON Analytical Laboratory include:

- Sample chain-of-custody.
- Analysis of duplicate samples (10 percent).
- Analysis of method blanks (10 percent).
- Analysis of fortified method blanks (10 percent).
- Analysis of QC performance samples (e.g., NBS, EPA).

In addition, the WESTON analytical laboratory participates in the EPA interlaboratory performance program for water (WS program) and wastewater (WP program).

Copies of the WESTON analytical laboratory QA/QC document and standard operating procedures are available for inspection.
V. PERSONNEL
ANALYTICAL LABORATORY ORGANIZATION
Fields of Competence
Trace organic and inorganic analysis using U.S. EPA, ASTM, AIHA methodology; analytical methods development; collection and analysis of environmental samples including ambient air, stationary source discharges, water, wastewater, biological tissue, biological fluids, soils, sediments and hazardous waste; development and implementation of laboratory quality assurance and quality control programs.

Experience Summary
Fourteen years experience in the following areas:
Preparation and analysis of environmental samples for inorganic and organic analytes using GC, GC/MS, AA, ICP, HPLC and wet chemical techniques. Method development for selected priority pollutant analytes in chemical process wastewater as part of U.S. EPA BAT program.
Development of methods for analysis of tetrachlorinated dibenzo-p-dioxin (TCDD) isomers in organic liquids and commercial chlorinated phenols using GC/MS selected ion monitoring techniques.
Methods validation for use of volatile organic sampling train (VOST) to collect and analyze volatile organic emissions from hazardous waste incinerators. Sampling and analysis of selected analytes in multimedia emissions from Refuse Derived Fuel (RDF) Waste-to-Energy processes.

Credentials
B.A., Chemistry—Wittenberg University (1963)
Ph.D., Chemistry—Michigan State University (1970)

Employment History
1984-Present  WESTON
1982-1984  Envirotech Engineers, Inc.
1977-1982  Midwest Research Institute
1973-1977  Small Environmental Group
1972-1973  Clyde E. Williams and Associates
1969-1972  Notre Dame University

Earl M. Hansen, Ph.D.

Key Projects
Managed a program to analyze environmental samples for 2,3,7,8-TCDD for the U.S. EPA. This program required the analysis of over 2,000 environmental samples in 1983.
Managed a sampling and analysis contract for U.S. EPA at Research Triangle Park, North Carolina. This program focused on the evaluation of a volatile organic sampling train (VOST) for the collection of volatile organic compounds from the gaseous effluents of hazardous waste incinerators. Directed the construction of two VOST trains and developed a protocol for the use of VOST to evaluate the performance of hazardous waste incinerators.
Managed five laboratory tasks as part of a contract with United States Army Toxic and Hazardous Materials Agency (USATHAMA) for contamination survey of Army installation. This included development and validation of methods for selected analytes using the USATHAMA Quality Assurance Procedure.
Participated in the design and preliminary evaluation of a laboratory-scale thermal destruction system to be used to evaluate the feasibility of incineration of liquid and solid hazardous wastes. Directed a multi-task program which required quick response methods evaluation and analysis of hazardous waste disposal sites. Samples received in this program were analyzed for substituted phenols and polynuclear aromatic hydrocarbons (PAHs) using GC/MS and HPLC.
Managed a program to analyze process wastewaters from six organic chemical manufacturing plants. This program was conducted for the U.S. EPA to identify and quantify the presence of organic and inorganic priority pollutants in these wastewaters. The project required design of sampling plans, development and evaluation of analytical methods, and collection and analysis of over 250 samples. These data were incorporated into the database which is to be used by U.S. EPA to establish Best Available Treatment Technology (BAT) regulations for the organic chemical manufacturing industry.
Led the evaluation, selection, and recommendation of an inductively-coupled plasma (ICP) spectrophotometer which was purchased as an addition to MRI's atomic spectroscopy instrumentation in 1981.

Professional Profile
Directed the completion of three projects requiring chemical analysis of air, water and solid waste effluents which were collected from the combustion of refuse-derived fuel (RDF) as a part of an environmental assessment of waste-to-energy processes. These samples were analyzed for trace inorganic and organic components using AA, SSMS, GC, and GCMS.

Supervised field activities for collection and shipment of wastewater samples collected from a pilot-scale wastewater treatment system in support of a treatability study of acid mine drainage conducted by the U.S. EPA.

Publications


Har, E.M., "Preparation and Analysis of Environmental Samples for 2,3,7,8-TCDD." Presented to St. Louis Section of American Chemical Society, St. Louis, Missouri (May 1983).

Hansen, E.M., "Analytical Methods for Determination of 2,3,7,8-TCDD in Soil." Presented as part of "Panel Discussion on Dioxin Risk Assessment," St. Louis Section of American Institute of Chemical Engineers (June 1983).

Field of Competence

His graduate and post-doctoral research was directed toward the development and application of analytical methodology for the study of small molecule metabolism. He was involved with the design and construction of a combined, computerized radio-gas chromatograph/mass spectrometer (RGC/MS) and its application to metabolic studies in fungi, plants and algae. For seven years at Southwest Research Institute he worked on developing methods for analysis of trace levels of organic pollutants in a variety of environmental matrices, characterizing potentially toxic organic components resulting from combustion processes and developing approaches to analyzing hazardous wastes. As manager of the GC/MS facility at Southwest Research Institute he also supported research in organic synthesis, fuel characterization, electronic component failure analysis and biochemistry.

Credentials

B.S. Chemistry - Geneva College (1969)
Ph.D. Biochemistry - University of Pittsburgh (1975)

Employment History

1984-Present  WESTON  Organic Laboratory Manager
1975-1978  University of Pittsburgh  Research Associate
1978-1984  Southwest Research Institute  Manager, Mass Spectrometry

Key Projects

Development of GC methods for the analysis of industrial process waters and effluents using a wide variety of detectors (ECD, Hall, PID, FID, NPD, TCD, FPD).
Characterization of organic pollutants in municipal sludges using GC/MS.
Analysis of biota and sediments from an oil producing area in the Central Gulf of Mexico to determine the presence and extent of contamination of petrogenic hydrocarbons.

Characterization of organic wastes generated by the organo-dromine industry.
Studies to elucidate the mechanism(s) of sediment formation in diesel fuel using pyrolysis capillary GC/MS and FT-IR.
Sampling and analysis of feedstock emissions and wastes from a coal/refuse co-fired power plant with emphasis on determining if chlorinated pollutants (particularly dioxins) were evolved.
Analysis of combustion products arising from haloaromatic polymers.

Publications


C.A. Bedinger and C.P. Nulton. Analysis of Environmental and Tar Samples from the Nearshore South Texas Area After the IXTOC-1 Blowout. Coastal Research, P. 19-22, October 1981.


Abstracts


Leslie Eng, Ph.D.

Fields of Competence

Analytical chemistry of priority pollutants, explosives, and U.S. Army chemical agents. Kinetics and mechanisms of chemical reactions. Interpretation of mass spectra, infrared spectra, proton nuclear magnetic resonance spectra and thermal analysis data. Quality assurance and quality control of chemical measurements. Microprocessor control of analytical instrumentation. Project management of research and development in chemistry.

Experience Summary

More than fourteen years experience in the design, programming, executing, and review of research and development programs in organic, inorganic, analytical, and physical chemistry.

Major areas of participation included development of analytical methods in air, water, soil, and biological tissue; elucidation of reaction mechanisms; studies on reaction kinetics; solid sorption of gases and liquids; analytical instrument design; development of an analytical quality assurance program; and statistical analysis of chemical data.

Credentials

A.B., Chemistry—The Johns Hopkins University (1965)
Chemical Officers Basic Course—Ft. McClellan, Alabama (1970)

Employment History

1984-Present WESTON
1973-1977 Edgewood Arsenal
1970-1973 Captain, U.S. Army

Key Projects

Served as Project Officer for chemical research and development programs as well as for operational support of ongoing analytical chemistry activities. Efforts included development of analytical methods; development of analytical reference materials; interpretation of analytical results; and optimization of chemical procedures. Principal author of the USATHAMA quality assurance program. Developed analytical methods for the analysis of explosives in water, soil, and biological tissue and organophosphorus compounds in water and decontamination brines.

Served as Project Officer for the development of microprocessor-based analytical instrumentation for air monitoring of hazardous chemicals to include chemical warfare agents.

Participated in outfitting a mobile laboratory by specifying required instrumentation to support operations. Trained personnel for the operation of the mobile laboratory to support of chemical agent demilitarization operations.

Planned, scheduled, monitored, and reviewed the work of up to seven laboratory personnel involved in research and development tasks and in the solution of problems of a chemical nature in engineering operations.

Served as principal investigator for the development of decontamination solutions for chemical agents. Conducted studies on the kinetics and mechanisms of decontamination reactions.

Served as principal investigator on studies to elucidate the mechanisms of degradation of activated charcoal additives used to enhance the protection against chemical warfare agents.

Conducted studies on the reformation of nerve agents from the thermal degradation of decontamination waste salts.
Fields of Competence

Laboratory QA/QC development and implementation; data management coordination, including quality assurance and quality control procedures; identification and quantification of chemicals through the use of instrumental and wet methods of analysis; chemical and microbiological analysis of potable, surface, and wastewater.

Experience Summary

Laboratory QA/QC requirements including compilation of analytical lab SOPs and maintaining and updating the lab QA/QC Manual; conducting laboratory audits, maintenance of certification records and requirements. As Data Management Coordinator: track sample status from log-in through final reporting and sample disposal; prepare lab QA samples and subsequent performance reports; interface with clients and regulatory agencies for monitoring/auditing purposes. Analysis of process and industrial waters; quality control checks of water treatment chemicals, chemical and microbiological analysis of streams, drinking water, and domestic and industrial wastewater using EPA and APHA Standard Methods of Analysis. Methodology includes wet methods of analysis, AA, GC, Auto Analyzer, and TOC.

Credentials

B.S., Chemistry Education—West Chester State College (1974), ACS Accredited Program.

Post-graduate courses in priority pollutants techniques of analysis; gas chromatography; water microbiology; toxicology; geochemistry; geological field studies; physics of the atom. Refresher courses in AA and GC.

Certified by EPA and the State of Pennsylvania to perform and supervise water microbiology.

American Chemical Society, Philadelphia Local Section, Division of Environmental Chemistry

Employment History

1982-Present   WESTON
1977-1982    Chester County Health Department
               Public Health Laboratory
Winter-Summer  Nalco Chemical Company
1977
1974-1976    West Windsor-Plainsboro
               High School

Key Projects

Completed documentation of methods for USATHAMA certification of the analytical laboratory. Responsible for monitoring lab QA activities and maintaining related records for major government project.

Completed documentation and other items necessary to receive EPA microbiological certification for the Chester County Health Department Laboratory.

Coordination of the Health Department Laboratory involvement in a quarterly stream monitoring program of Chester County streams.

Set up and instituted a training program for operation and maintenance of the Technicon Auto Analyzer II for nutrient parameters in water analysis.

Development of standard operating procedures for the laboratory, including QA/QC development and implementation to meet certification requirements and to ensure the timeliness and accuracy of the laboratory's work.

Interim Director of a water testing laboratory for one year involving routine chemist's duties plus monthly and annual laboratory statistics and budget preparation.

Development and implementation of an academic chemistry program for high school students.

Professional Profile
Fields of Competence
Ambient, source and industrial hygiene air pollution monitoring; analytical wet chemistry using ASTM and U.S. Environmental Protection Agency (U.S. EPA) methodology; microbiological analysis of water, wastewater, air and humans; collection and analysis of drinking water, industrial process streams and hazardous wastes.

Experience Summary
Thirteen years experience in the following areas:
Method development for U.S. EPA ambient and stationary source monitoring methods. Team leader for numerous air program evaluations and compliance tests for industry and government. Method development for detecting pesticides and PCB's in air by use of solid sorbent media. Sampling and analysis of pesticides and PCB's in indoor atmospheres and at hazardous waste facilities using polyurethane foam sampling cartridges. Method development for concentrating and collecting biological and viral organisms around sewage treatment facilities and sewage spray irrigation operations to determine aerosolization characteristics.
Familiar with U.S. EPA and standard method procedures for the analysis of metals, inorganics, herbicides, pesticides, PCB's and acid/base-neutral extractable for GC/MS analysis.
Method development for a variety of environmental matrices from hazardous waste to analyze for trace-level organic pollutants.

Credentials
B.A., Microbiology—University of Texas at Austin (1971)

Employment History
1985-Present WESTON
1973-1985 Southwest Research Institute
1972-1973 Kelsey - Seybold at NASA
1971-1972 Southwestern Laboratories

Key Projects
Conducted sampling and analysis of hazardous industrial waste from plants in several industrial categories. The purpose of the study was to characterize wastes in accordance with U.S. EPA's May 19, 1980 regulations.
Participated in sampling and analysis of industrial wastewaters from numerous plants in the plastic and organic chemicals industrial categories for priority pollutants under a program for U.S. EPA-EGD. This effort was for both screening and verification analysis of industrial wastewater. One of the methods developed was a microextraction procedure that was later adopted by the U.S. EPA-EGD for use in the verification programs.
Participated in sampling and analysis program in the environmental monitoring effort of Love Canal program sponsored by U.S. EPA-EMSL.
Participated in method development and collaborative studies of U.S. EPA Stationary Source Methods 2, 3, 4, 5, 6, 7, 8, 9 and 17. Also participated in collaborative testing of Methods 2, 3 and 5 using paired particulate sampling trains.
Participated in two programs jointly funded by U.S. EPA and U.S. Army Medical R&D to evaluate health implications of sewage treatment facilities and to evaluate health effects associated with the application of wastewater to land.
Participated in a U.S. EPA program to develop and validate analytical methods for pesticides, PCB's, nitroamines, and phthalate esters in using non-GC/MS techniques. These methods were later proposed as Federal Register methods 606, 607, and 608 for quantitative analysis of drinking, surface, and wastewater samples.
Participated in a comprehensive seven-year monitoring and ecological analysis of a coastal power plant con-

James M. Taylor
sidered by regulatory agencies to be an environmental hazard because the outfall from the cooling pond was slightly higher in temperature and salinity than the receiving waters.

Participated in sampling and analysis of feed, emissions and waste from a coal refuse-fired power plant to determine chlorinated emissions.
Edward P. McGovern, Ph.D.


Key Projects

Development of GC and HPLC methods for determination of priority pollutant levels in industrial wastewater and effluent.

Analysis of biota, water soils and sediments from the Love Canal area.

Characterization of organic wastes generated by the organophosphate industry.

Characterization of organic wastes generated by the thiocarbamate and carbamate pesticide industries.

Development of high-performance liquid chromatographic methods for the determination of aminothiol and phosphorothioate anti-radiation compounds in plasma.

Publications


Professional Profile
George H. Perry

Fields of Competence


Experience Summary

Residue analysis of environmental, industrial, and bioassay samples for hydrocarbons, pesticides and priority pollutants.


Credentials

B.S., Chemistry and Marine Science—Southampton College (1976)
Student Intern—Woods Hole Oceanographic Institute
American Chemical Society

Employment History

1983-Present WESTON
1975-1977 New York Ocean Science Laboratory

Key Projects

Project manager for two year study of pesticide and PCB levels on the United States continental shelf.
Member of U.S. scientific team dispatched to take samples after the Ixtoc oil well blow-out off the Yucatan Peninsula.
Contributing writer to recently published EPA Hazardous Waste Analysis Procedures.

KC Experience

Project design and report in litigation involving herbicide damage.
As contractor to EPA in Kansas City, reviewed data assessing dioxin distribution in Missouri.

Professional Profile
**Fields of Competence**

Analytical analysis of gaseous mixtures and petroleum fractions using wet chemicals, GC/MS, and CI/MS procedures.

Teaching laboratory classes for freshman and other undergraduate classes.

Volatile and Semi-volatile Organics Analysis of variety water and soil samples by GC/MS. GC/MS Analysis of various miscellaneous types of samples.

**Experience Summary**

Several years of teaching laboratory classes including instrumental analysis and spectral data interpretation (IR, UV, 1H NMR, and MS).

Two years of analytical service (especially mass spectrometry) in petroleum industry as quality control process.

**Credentials**

B.S., Chemistry, Physics—University of Saigon, Viet Nam

Ph.D., Physical Chemistry/Mass Spectrometry—University of Delaware (1984)

American Chemical Society

American Society for Mass Spectrometry

Past Honored Member of American Association of University Women (Newark Division)

**Employment History**

1963-Present

WESTON

1980-1982

Ashland Oil, Inc.

Petroleum Division

1977-1980

University of Delaware

1966-1973

University of Saigon

**Key Projects**

Volatile organics analysis of variety water samples by GC/MS; GC/MS analyses on other miscellaneous types of samples: mass spectra interpretation of unknown compounds in samples.

Training personnel for mass spectrometric analyses of environmental samples.

Supervision of GC/MS personnel.

Review and validate MS Data from contractor labs on dioxin analyses for EPA Region 7, Kansas City. Evaluate and store QA/QC data related to dioxin analyses.

Training personnel for mass spectrometric analysis of petroleum products.

GC/EI/MS of special samples from carbon fibers, asphalt.

Hydrogenation and mass spectrometric analysis of high olefinic gasoline fractions.

**Professional Profile**
**Denise S. Fisher**

### Fields of Competence

GC/MS analysis of priority pollutants; laboratory data management; statistical analysis of data; wet chemistry and microbiological analysis of water and wastewater; water and wastewater treatment plant operations.

### Experience Summary

Seven years of analytical laboratory experience including GC, GC/MS, HPLC, AA, wet chemistry and microbiological methods. Familiar with operation of Finnegan 1020, 4000, and 5100 GC/MS systems and EPA procedures for analysis of organics. Performed marine benthic studies with the National Science Foundation. Familiar with marine and freshwater bio-assay techniques, stream surveys and general field procedures. Familiar with NPDES requirements and testing procedures.

### Credentials

- B.S., Environmental Science—Juniata College (1977)
- EPA Certification—Microbiological analyses of drinking waters
- WPCF Research Committee, Past member

### Employment History

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<tr>
<th>Year</th>
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<tbody>
<tr>
<td>1983-Present</td>
<td>WESTON</td>
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<tr>
<td>1980-1982</td>
<td>Borough of Downingtown</td>
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<tr>
<td>1978-1980</td>
<td>Bowman Corporation</td>
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<tr>
<td>1977-1978</td>
<td>Penn Township, Hanover</td>
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### Key Projects

- GC/MS analysis of Twin Cities soils for priority pollutants.
- GC/MS analysis of Atlantic City, NJ drinking water wells for suspect pollutants.
- Analysis of leading food manufacturer's products suspected of priority pollutant contamination.
- Sample and data management of laboratory projects.
- Data management for Savannah, Letterkenny, and Anniston Army Base projects.
- EPA Contract Laboratory Performance Evaluation and sample analysis by GC/MS.
- Assisted in planning of computerized laboratory data management system.

### Professional Profile
Fields of Competence
ICP/AA (Inductively Coupled Plasma/Atomic Absorption) expert. Laboratory analysis of water, wastewater, and gas samples involving instrumental and wet chemistry methods; air pollution source surveys and ambient air surveys; operation, calibration, and maintenance of laboratory and field sampling and analytical equipment.

Experience Summary
Sixteen years laboratory and field experience in air pollution and wastewater sampling and analysis, including emission source studies, ambient air surveys, instrumental and wet chemistry analysis, and related calculation and data interpretation activities. Sixteen years experience in instrumentation and wet chemistry methods involving primary, secondary, and trace metals analysis by inductively coupled plasma and atomic absorption in physical and biochemical matrices.

Credentials
Business Management—St. Joseph's College, Philadelphia College of Textiles & Science
Inorganic Chemistry—Philadelphia College of Textiles & Science
Licensed Bacteriologist for Multi-Tube and Membrane Filters

Employment History
1957-Present	WESTON
1957	Lukens Steel Company
1966-1967	U.S. Army
1985-1985	Lukens Steel Company

Key Projects
Participated in the Naval Ship Research and Development Center Inter-Laboratory Study of Oil-In-Water Analysis by Infrared Spectrophotometry.

Assisted in the analysis of samples generated by the NAVCER (U.S. Navy) in survey of three naval installations for the characterization of the domestic wastewater effluents.

Analyst for EPA-sponsored guidelines study of the organic chemicals, fuel, steam generating, and non-contact cooling water industries.

Laboratory analyst for the Delaware College of Marine Studies program of metals identification in marine sediment samples.

EPA testing project on mercury by atomic absorption (flameless method), including mercury analysis on soil, wheat, earthworms, and rodents.

Chief analyst on a decontamination study of nearby wells and streams for heavy metals and trace metals contaminants.

Chief analyst for U.S. Army certification and methods development for heavy metals and trace metals in soil, water, and explosives.

Chief analyst for methods development on heavy metals and trace metals for many confidential clients.

Chief analyst for NPDES re-permitting studies for Pennsylvania Power and Light and Philadelphia Electric Company—heavy metals and trace metals.

Chief analyst for Bethlehem Steel wastewater characterization study for methods development and analysis—heavy metals and trace metals in water and wastewater.

Chief analyst for an industrial wastewater characterization study for a large automobile manufacturer—heavy metals and trace metals in water and wastewater.

Participated in air pollution source surveys in the ceramics, sponge iron, steel, fertilizer, chemicals and other industries involving such contaminants as particulates, nitrogen oxides, sulfur oxides, fluorine, ammonia, phosphates, carbon monoxides, silica, and chlorides.

Participated in field evaluation of air pollution control systems (scrubbers and precipitators) at two municipal incinerators in the City of New York, involving sampling and analysis of particulates, sulfur dioxide, chlorides, organic acids, ammonia, aldehydes, nitrogen oxides, ozone, carbon monoxides, and hydrocarbons.

Professional Profile
Nancy Robertson

Fields of Competence


Experience Summary

Four years experience in air pollution measurement activities involving source, fugitive, and visible emission evaluations for a variety of industrial and governmental clients; and the collection and analyses of water and wastewater samples. Major responsibilities presently include analyses for all major wet chemistry programs performed by WESTON, including experience with the following field and laboratory instrumentation: RAC/Nutech control consoles, ORSAT apparatus, Andersen cascade impactor/preseparator, micro processor ionanalyzer 901, UV VIS spectrophotometry.

Credentials

A.S., Environmental Science and Chemical Laboratory Analysis—Santa Fe Community College, Gainesville, Florida
Visible Emissions Evaluation (EPA Method 9)—Certificate
General Health and Safety Training—Certificate (U.S. Department of Labor)

Employment History

1979-Present WESTON
1978-1978 Santa Fe Community College

Key Projects

Project Leader on several work assignments for EPA, RTP, NC. Responsible for project planning and preparation, conducting surveys, data management, and report development.

Project Leader on several source testing, ambient air monitoring, and environmental sample analysis task assignments for a confidential client. Responsible for all aspects of each assignment, from planning to the reporting of results.

Chiefly responsible for the analytical effort on a project designed to characterize emission parameters from refinery process heaters, boilers, and FCCU regenerative sources for a confidential client.

Extensive air pollutant testing and analysis experience for corporate, governmental, and industrial contracts.

River assimilative capacity study for Stone Container.

In-plant wastewater survey for a confidential client.

Hazardous waste surveys and characterization for priority pollutants for Bergstrom Paper Company.

Participated in hazardous waste survey and characterization of soil/groundwater from an abandoned landfill in the City of Philadelphia.

Effluent survey of over 20 of the client’s plants for priority pollutants.

Evaluation/assessment of soil and water samples for toxic waste content at recently discovered industrial dump site.

Methods development, interference elimination, and procedures enhancement on specific inorganic analytical tests.
Edna C. Masson

Fields of Competence

Laboratory analysis of chemicals, water, wastewater, and gaseous samples utilizing wet chemical procedures.

Experience Summary

Thirty years of analytical activities including quality control, process control, and process development related to the manufacture of industrial, reagent, and specialty chemicals. Laboratory analysis related to various phases of environmental services and analytical methods development.

Credentials

B.S. in Chemistry—Ursinus College (1939)
Certification in Secondary Education—Ursinus College (1941)

Employment History

1972-Present WESTON
1946-1972 Allied Chemical Corporation
Chemist

Key Projects

Analysis for a pharmaceutical firm project to develop modifications to Standard Methods-4138 method for cyanide analysis to eliminate a positive interference in wastewater.
Research project to develop a synthetic suspended solid sample for use in EPA's Quality Assurance Program (EPA, Cincinnati, Ohio).
In conjunction with University of Delaware College, WESTON analyzed more than 500 biological and marine sediment samples for 11 constituent trace metals as part of a program to identify and trace the migration of metals from ocean dumping of sludges on the continental shelf off the coast of the State of Delaware.
Effluent guideline studies for U.S. EPA covering the rubber, organic chemicals, miscellaneous chemicals, and steam supply and noncontact cooling water industries. Greater than 5,000 samples at more than 300 locations across the U.S. were analyzed for approximately 50,000 analyses.
Participation in Rhode Island 208 Study that involved substantial groundwater monitoring for inorganic and organic analysis, including phenol and cyanide.
Analyst for inorganic analysis under the Safe Drinking Water Act.
Analyses of vegetation samples for boron and fluoride, also air samples for boron, fluoride and fluoroborate from several plant locations for a Confidential Client.
Wet analyses of sludge, plant influent and effluent, river water and creek water for COD, ammonia, organic N, nitrite, nitrate, sulfate for a major Pharmaceutical Firm.
Wet analyses of sludge and leachates for sulfide and cyanide content for Bergstrom Paper.
Conducted wet analyses for solids, oil, and grease for the Federal Government (Philadelphia).
Performed wet analyses for Cr+6, boron, preparation of samples prior to AA analyses for the Client's (Wilmington, Delaware) NPDES monitoring program.
Helped develop the Shenandoah River Wasteload Allocation Model for a Confidential Client, performed wet analyses for nitrogen components (NH₄-N, TKN, NO₂-N, NO₃-N).
Performed analyses for COD, alkalinity, acidity, color for an industrial Client.
Performed wet analyses (following waste treatment study) for soluble and insoluble COD, and solids.
Conducted analyses for gravimetric sulfate and gravimetric silica.
Performed analyses for fluoride, sulfide, and COD.
Cooperated with engineer on treatment studies for the removal of fluoride from plant process wastes.
For a major Pharmaceutical company's air pollution project, performed analyses for oxides of nitrogen (NOX).
Conducted analyses for NO₃ for the Essex Chemical air pollution project.

Professional Profile
Joseph Konschnik

Fields of Competence

Performance of field and laboratory analyses for water samples: performance of sampling routines for surface water, groundwater, and acid rain projects involving both chemical and biological water quality; assisted in the assembly of several reports for various water quality projects.

Experience Summary

Experience in design and implementation of water quality assurance programs and sampling routines. Performed lab and field chemistry techniques for both chemical and biological water quality projects. Experience in trace metal analysis of water, soils, sludges, and plant materials and performing statistical evaluation of data and interpretation of results.

Credentials

B.S., Environmental Health; Minor in Biology—West Chester State College (1982)

Employment History

1983-Present
WESTON

1982-1983
United States Geological Survey, Water Quality Division

Key Projects

Re-permitting project for a Susquehanna River power plant.
Brandywine Creek DER Klebsiella project.
Chester County biological diversity study.
Philadelphia groundwater study project.
Oley Township water quality survey and assessment.
White Clay Creek soil loading study.
Northeastern U.S. acid precipitation study.

Professional Profile
Fields of Competence

Field and laboratory studies in aquatic biology including fisheries, benthos, water quality, hydrology, and taxonomy.

Experience Summary

Four year’s experience in biological investigations of aquatic environments, including field surveys of floral faunal communities, species interaction, and habitat assessment. Responsible for species biocharacteristics analyses, as well as water quality, hydrology, and management programs.

Credentials

B.S., Biology — Pennsylvania State University (1978)
Certificate, American Red Cross, Cardiopulmonary Resuscitation
Certified (NAUI) Scuba Diver
American Fisheries Society

Employment History

1979-Present WESTON
1978-1979 Pennsylvania Fish Commission
Fisheries Management Division

Key Projects

Participated in Pennsylvania fisheries management/inventory program to characterize the physical, chemical, and biological attributes of the state’s fisheries resource. Involved in field data collection, quantitative and qualitative evaluation, and preparation for computer generated classification management system.

Project design and management of creel surveys on Pennsylvania waters for trout and warmwater species.

Extensive laboratory analysis of stomach contents of largemouth bass to assess the importance and effectiveness of stocked alewife, Alosa pseudoharengus, as forage for the bass in a man-made impoundment.

Participated in all phases of a study to evaluate the impact of hydroelectric facilities on fisheries resources and water quality in the lower Susquehanna River. Impact assessment was based on DO and temperature, and the effect of hydroelectric facilities on the habitat and life cycle requirements of the downstream fish populations. Major effort involved field research on the impact of low river flow and subsequent entrapment of the area fishery.

Collected baseline water quality, hydrologic, and bathymetric data on the Kennebunk River estuary in Maine. The data was used as input to a desktop computer model to predict river assimilation capacity under conditions of increased waste loading.

Sampled sediment and water from sedimentation ponds contaminated by an accidental spill of sodium chromate. Cores were analyzed to locate chromium accumulations, and their potential for stabilization in the substrate and water column, as well as assessing the contamination potential for bioaccumulation in a recreational pond fishery.

Conduct biennial aquatic and terrestrial surveys of a marsh area contaminated by landfill leachate. Qualitative and quantitative surveys provide continuous monitoring of the affected marsh ecosystem.

Coordinate and perform bimonthly bathymetric surveys of the Delaware River bottom topography near-field to the Salem Nuclear Generating Station, New Jersey. Bathymetric analysis provides information used to direct maintenance dredge operations in the plant intake zone of water withdrawal.

Participated in the investigation of the effects of open-water dredge material disposal in Lake Erie. Collected sediment and benthic invertebrates in and near disposal areas. Analyzed meiofaunal fauna for taxonomic identification, enumeration, and statistical analyses.

Conducted water quality collections and measurements of an industrial effluent into the Muskingum and Tenscawara Rivers (Ohio) to determine the effect of increased nutrient loading.

Conducted a terrestrial and soil survey to establish whether a Tennessee habitat should be classified as a wetland.

Sampled sediment from a recreational lake to determine the extent of PCB contamination from industrial sources.

Conducted flow proportional sampling of process and non-process outfalls from various utilities to provide analytical data necessary for application of NPDES permits.
Richard Brane

Fields of Competence

Analytical analysis, especially wet methods using Standard Methods for the Examination of Waste and Wastewater, EPA Methods, and ASTM Methods. Specific testing, including: ultraviolet-visible analysis of phosphates, sulfates, phenols, cyanides, silicates and chromium VI; IR and gravimetric determination of oils/hydrocarbons; titration and gravimetric determination of ammonia, TKN, COD, and acidity/alkalinity. Preparation of IR and VV spectra of purified compounds obtained by preparative gas chromatography separation; interpretation of IR, VV, and NMR spectra of purified organic compounds; use of organic synthesis methods including Grignard reactions, dehydrogenations of unsaturated alcohols, and sodium-liquid ammonia reductions of alkadienes; use of specific ion electrochemical methods.

Experience Summary

Ten years experience as a chemist performing laboratory analyses on samples supplied by clients and engineers.

Eleven years in U.S. Navy as naval officer. Responsibilities involved shipboard engineering, radar, and missile systems. Two years experience at China Lake, California as liaison for shipboard compatibility/testing of ordnance.

Credentials

B.S., Chemistry—Duquesne University (1958)
Graduate work in Fuel Technology—Pennsylvania State University (1958-1959)
M.S., Chemistry—Naval Post-Graduate School (1967)
Courses for certification to teach Chemical Technology—Pennsylvania Department of Education (1971-1976)
American Chemical Society
Sigma Xi
American Association for the Advancement of Science
National Education Association

Employment History

1973-Present
WESTON

1971-Present
Marple Vo Tech
Chemical Technology Instructor

1961-1971
U.S. Navy

1969-1971
Naval Weapons Center

1967-1969
USS Dahlgren
Missile Officer

1964-1967
Naval Postgraduate School

1982-1984
USS Okinawa
Auxiliary Officer

Key Projects

Analyses of vegetation samples for boron and fluoride, and air samples for boron, fluoride, and fluoroborate from several plant locations for a major manufacturer.

Wet analyses of sludge, plant influent and effluent, river water and creek water for COD, ammonia, organic N, nitrate, nitrite, sulfate for a pharmaceutical firm.

Wet analyses of sludge and leachates for sulfate and cyanide content for Bergstrom Paper.

Conducted wet analyses for solids, oil, and grease for the U.S. Coast Guard (Philadelphia).

NPDES monitoring program General Motors (Wilmingtion, Delaware). Wet analyses for Cr++, boron, preparation of samples prior to atomic absorption analyses.

Prepared Shenandoah River Wasteload Allocation Model for Merck. Conducted analyses for nitrogen components (NH,N, TKN, NO, NO).

Conducted analyses for COD, alkalinity, acidity, and color for a confidential client.

Conducted wet analyses (following waste treatment study) for soluble and insoluble COD and solids for a confidential client.

Performed analyses for gravimetric sulfate and gravimetric silica for United Engineers.

Professional Profile
Conducted analyses for fluoride, sulfide, and COD for M&M/Mars.

Cooperated with engineer on treatment studies for the removal of fluoride from plant process wastes for a confidential client and Thomson C.S.F.

Participated in air pollution project for a pharmaceutical company. Conducted analyses for oxides of nitrogen (NO\textsubscript{X}).

Participated in air pollution project for Essex Chemical. Conducted analyses for NO\textsubscript{X}. 
VI. EXPERIENCE
VI. EXPERIENCE

Described below are selected examples of the WESTON laboratory's experience with hazardous waste analyses including high hazardous samples, environmental samples, and air samples.

Confidential Client

WESTON is analyzing samples as part of an ongoing groundwater monitoring program at a former solvent production, handling, and storage site. Samples from 16 wells are collected semi-annually and analyzed for total organic halogens (TOH), total organic carbon (TOC), and volatile organic analytes (VOA) by GC/MS. Groundwater samples contain 25 to 500 mg/L of selected volatile organic compounds. The client requires analytical data to be submitted in EPA-CLP format for review by a state regulatory agency.

Lehigh Electric Hazardous Waste Site, Old Forge, Pennsylvania

WESTON conducted an extensive analysis task as part of a remedial action program for the U.S. EPA at the Lehigh Electric and Engineering Company site in Old Forge, Pennsylvania.

Samples were analyzed for PCB's, as well as organic priority pollutants using GC and GC/MS techniques. Analytical methodology including quality assurance/quality control was conducted in accordance with U.S. EPA approved procedures.

Throughout the course of the project, WESTON worked closely with personnel from national and regional offices of the U.S. EPA, as well as state and local authorities.

Technical Assistance Team Support for U.S. Environmental Protection Agency

WESTON was retained to develop an acceptable protocol for a rapid field screening procedure for the detection of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) in soils at concentrations greater than 1 ug/kg. The analytical protocol was required to address the overall validity/reliability of the proposed instrumentation package with respect to specified precision, accuracy, and detection limits.
In conjunction with the hardware vendor, WESTON rapidly developed a flexible method utilizing isotopically labelled 2,3,7,8-TCDD and a mobile, tandem mass spectrometer (MS/MS). The mobile MS/MS system, combined with a rapid cleanup/extraction procedure, allows screening of 30 to 50 samples per day compared with 8 to 10 samples per day using conventional GC/MS-SIM techniques. WESTON has achieved:

- A favorable comparison of MS/MS to EPA GC/MS results on soil samples containing 2,3,7,8-TCDD.
- New data on extraction efficiency vs. soil moisture content.
- Elimination of false negatives for 2,3,7,8-TCDD using the MS/MS analysis for soils.
- Demonstration of a rapid on-site screening method allowing for immediate mapping of analyte isopleths and a concomitant decrease in operational costs.

Pennsylvania Power and Light Company (PP&L) ... Allentown, Pennsylvania

PP&L wanted to determine the potential for elemental uptake by corn plants grown on the retired fly ash basins. WESTON measured the levels of arsenic, boron, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, selenium, strontium, titanium, vanadium, and zinc in soil, fly ash, and corn. Both control and experimental fields were used. Laboratory analyses were performed in WESTON's laboratory and results statistically compared both against one another and to recent literature results.

Confidential Client ... Pennsylvania

WESTON has been retained by the operator of a hazardous waste disposal facility to conduct quarterly groundwater monitoring for compliance with RCRA self-monitoring requirements. Over four quarters of sampling and analysis for the full complement of RCRA parameters, plus associated characterization criteria related to the types of wastes disposed at the facility, have been conducted to date. Meticulous attention has been paid to use of standard sampling and analytical protocols, in view of the use of the analytical results in responding to regulatory compliance orders. WESTON has been responsible for the sampling, analysis, interpretation, reporting, and documentation of the analytical results.
Allegany Ballistics Laboratory... West Virginia

WESTON has been contracted by the U.S. Navy (Norfolk, Virginia) to perform a confirmation study at the Allegany Ballistics Laboratory (ABL) in West Virginia. The sample analysis includes a number of military specific parameters including 10 explosives: TNT, 2,4-DNT, 2,6-DNT, 1,3,5-DNB, 3,5-DNB, 2,4-DNP, HMX, RDX, NG, and NC. Other analyses include volatile and extractable organic priority pollutants by capillary GC/MS and priority pollutant metals by flame and flameless atomic absorption spectrophotometry. Both soil and water samples were collected. The purpose of the program is to determine if contamination exists at suspect sites.

The field program requires strict adherence to quality control and safety procedures. In addition, security clearance is required for field personnel.

Confidential, Electric Utility Industry - NPDES Consolidated Permit Sampling and Analysis Program

WESTON executed an NPDES Consolidated Permit Reapplication analysis effort for a major electrical utility located near the eastern seaboard. The program was conducted for nine operation stations. A complex schedule and logistics plan was developed to complete the project within a narrow timeframe. The program included site surveys to develop detailed sampling plans, field sampling, flow measurement, chemical analysis, and the preparation of permit application forms, flow balances, and detailed reports for each station. Approximately 33 process and non-process streams were sampled and characterized. Multiple field teams were employed to sample, around-the-clock, as many as three plants simultaneously. Flows were measured at most sample points using a variety of techniques including weirs, lithium dilution, bucket and stopwatch, and existing and temporary instrumentation. The samples were analyzed for conventional pollutants and metals, as well as the entire list of organic priority pollutants. All sampling and analytical techniques were performed in accordance with EPA-approved procedures. Analytical data were used to complete permit reapplication forms. Flow data were used to verify and update the existing water balance for each facility.
USATHAMA ... Indiana Army Ammunition Plant

WESTON collected and analyzed over 60 water, soil, and sediment samples from this site to determine the extent of arsenic contamination on the plant site and whether there was any migration off-site. Analyses were performed in accordance with USATHAMA certification and QC requirements, and data were entered into the USATHAMA computerized data base.

Sampling and Analysis of Groundwater ... U.S. Army

WESTON is responsible for collecting samples periodically from 20 groundwater production wells on and around Sharpe Army Depot at Lathrop, California. Samples are collected using USATHAMA methods and procedures for a variety of parameters including volatile organic compounds, metals, and pesticides.

WESTON performed analyses on the collected samples for each parameter providing a 15-day turnaround time. Volatile organic analyses are performed using USATHAMA methods, and all other analyses are performed using State of California certified quality control procedures.

Analytical Chemistry ... Owens Corning Fiberglas

WESTON's laboratory conducted an analytical program which included more than 20 facilities. Wastewater samples were collected for NPDES reporting of priority pollutants and solid and hazardous wastes analyzed under RCRA requirements.

WESTON chemists, in conjunction with Owens Corning Fiberglas (OCF) personnel, were able to trace product and raw material losses from GC/MS data at a number of the facilities, resulting in immediate abatement and substantial savings in raw materials and products.

This was a multifacility study, conducted under a Basic Ordering Agreement. Wastewater sample collection was performed by WESTON, and OCF personnel were trained to continue the sampling program.

The project involved an analytical turnaround time of two to three weeks on large numbers of samples for priority pollutants. Technical meetings/discussions were held between WESTON and OCF to review, interpret, and summarize the analytical findings.
Analyses of Groundwater Monitoring Wells

WESTON conducted analysis of 15 groundwater monitoring wells. The samples were analyzed for a series of explosive compounds using HPLC techniques. The sampling was conducted twice over a six-month period. Laboratory certification conforming to the Laboratory Quality Assurance procedures of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) was required for analysis of these samples.

Confidential Client

WESTON was contracted to rapidly determine the chemical composition of potentially hazardous and unknown buried drum contents recently discovered during construction activities on this confidential client's manufacturing grounds. WESTON responded within 4 hours of the client's request for assistance. Rapid analytical turnaround divulged the correct identification of the substances. Eventually, over 70 drums were located, sampled, and analyzed either singly or in composite, such compositing being based on similar gross physical/chemical characteristics among samples.

Under unannounced EPA scrutiny, WESTON correctly and rapidly identified drum contents, allowing for cost-effective disposal and site restoration. WESTON's analytical results closely matched EPA-determined data.

U.S. EPA - Contract Laboratory Program (CLF)

The WESTON Analytical Laboratory is under contract with the U.S. EPA to analyze low and medium level samples for HSL organic compounds using GC and GC/MS techniques. Sample matrices include surface and groundwaters, soils, sediments, and sludges. The WESTON Analytical Laboratory is contracted to analyze a minimum of 50 samples per month under this program.

General Motors

The WESTON Analytical Laboratory provided daily analysis of 24 samples in support of a wastewater treatability study conducted over 45 days. These samples were analyzed for lead, cadmium, zinc, and suspended solids with verbal data transmitted to the client within 8 hours. A hardcopy report was provided with 24 hours.
Incinerator Trial Burn - Confidential Client

The WESTON Analytical Laboratory analyzed 80 sample cartridges for volatile POHC's in support of a trial burn of a liquid hazardous waste incinerator. The sample cartridges (Tenax and Tenax/Charcoal) were analyzed by GC/MS according to the procedures described in "Protocol for the Collection and Analysis of Volatile POHC's Using VOST" (EPA-600/8-84-007).