

APPENDIX G

**QUALIFICATIONS OF
ENVIRONMENTAL PROFESSIONALS**

PROJECT DESCRIPTIONS: REGULATORY COMPLIANCE AUDITING, DUE DILIGENCE EXAMINATIONS AND PHASE I ENVIRONMENTAL SITE ASSESSMENTS

Developed proposals, evaluated environmental compliance status and performed Phase I Environmental Site Assessments and Due Diligence Examinations at active and inactive facilities throughout the United States. Prepared technical reports for clients.

Issues reviewed included solid and hazardous waste units, releases of hazardous and industrial wastes into soil and groundwater, aboveground and underground storage tank (AST, UST) usage, spill prevention measures (SPCC), wastewater (NPDES) and storm water discharges (SWPPP), air quality, SARA Title III, Toxic Substances Control Act (TSCA), polychlorinated biphenyls (PCBs), radon, urea formaldehyde foam insulation, lead in drinking water, lead-based paints, asbestos, adjacent property usage and sensitive receptor inventories.

1. Confidential Oil and Natural Gas Pipe Line Insurance Claim Client Historical Environmental Document Review Texas, Louisiana

Generated a chronological report of all available historical environmental assessments and remediation activities of oil and natural gas pipeline facilities preparing an insurance claim for damages associated with historical environmental releases of wastes and product to onsite and offsite soils and groundwater. Data gaps in the previous site characterization and remediation phases were identified enabling the Client to project and recover costs associated with completing supplemental soil and groundwater quality investigations and remediation.

2. Major Oilfield Equipment Manufacturing and Maintenance Service Companies TX, NM, ND, CA, MS, OK, MT, CO, LA and KS

Planned and conducted regulatory compliance audits, due diligence examinations, Phase I soil investigations and waste stream characterizations for 20 active facilities in 10 states.

Prepared technical reports for submittal to attorneys and state agencies. All work was conducted under "Privileged and Confidential" attorney/client work product provisions to support litigation.

3. Major Pump Manufacturing, Machining and Repair Facilities Virginia, Pennsylvania, Maryland and New Jersey

Planned and conducted a pre-acquisition limited regulatory compliance audit, limited permit review and a due diligence examination that met the requirements of ASTM E1527-94 at four pump manufacturing, machining and repair facilities in four states within five days. Soil and waste samples were taken where appropriate.

Prepared technical reports for submittal to the client's attorneys. All work was conducted in support of a major multiple facility acquisition under "Privileged and Confidential" attorney/client work product provisions. Compliance and permit topics included the following:

- RCRA compliance: waste characterization and documentation, waste vendors (TSD facilities, transporters, recyclers, etc.), generator reporting, manifest tracking, hazardous waste accumulation, satellite accumulation areas, land disposal restrictions
- Special wastes: used oil, universal wastes
- Non hazardous solid wastes
- SARA Title III: Extremely Hazardous Substance Notification, MSDS, Section 312 Tier II Forms (Hazardous Substance Inventory Reporting), Toxic Chemical Release Reporting (Form R)
- Release Reporting: CERCLA, EPCRA, CWA, RCRA
- Clean Air Act: operating permits, compliance monitoring and record keeping
- NPDES Industrial Process Discharge Permits, total maximum daily loads, toxicity testing
- Local sanitary district permits and septic system discharges
- Storm water NPDES Discharge Permits: sampling and monitoring, pollution prevention plan, inspections and training
- SPCC Plans
- SDWA compliance
- PCB Management and Control: equipment evaluation and management, records retention policy for disposal
- Asbestos Containing Materials: programs and policies, inspections, removal, renovation and demolition

4. Specialty Valve Rental and Repair Facility Texas

Planned and conducted a pre-acquisition limited regulatory compliance audit/due diligence examination of a specialty valve rental and repair facility.

5. Major Oil Company - Exploration and Production Louisiana

Performed a due diligence examination and regulatory compliance audit of production facilities on an inland surface water body. Production facilities inspected included wells, flow lines, separators, dehydration units, compressors, oil stock tanks, and salt-water disposal wells. State and federal agency records were reviewed to assess compliance status of facilities with respect to surface water discharges, underground injection and waste management practices.

6. Major Independent Oil and Gas Operator Texas

Conducted a preliminary due diligence assessment on an oil and gas production lease owned by a pulp\paper company and formerly operated by three oil companies. Reviewed due diligence documentation generated by previous consultants and co-authored the soil and groundwater assessment strategy for the abandonment and divestiture of the production facilities.

7. Independent Oil and Gas Company Operating In India and Australia

Prepared a proposal and scope of work for the comprehensive Due Diligence\Phase I Environmental Site Assessment of onshore and offshore oil and gas production facilities. Environmental issues included chemicals management, solid wastes, wastewater, storm water, and soil quality, spill containment measures, onshore pipelines, PCBs, offshore platforms, site reconnaissance, asbestos and ozone depleting substances.

8. High Density Polyethylene Manufacturing Facility Louisiana

Audited the facility to assess the regulatory compliance status of the facility for SARA Title III (Sections 311, 312, 313) and TSCA.

9. Cogeneration Facility Louisiana

Conducted a due diligence examination, regulatory compliance evaluation and permit status assessment for a 54-acre plant expansion. The site was located within the property boundaries of an existing power plant that was planning to permit and construct two surface impoundments, two process units and a material handling area.

10. Major Bottling Company\Former Bulk Fuel Terminal Colorado

Proposed, managed and conducted a due diligence examination and regulatory compliance audit of a former bottling facility slated for divestiture by the client. A portion of the site was formerly operated as an AST bulk fuel terminal. No records were on file with any of the federal, state or local environmental regulatory agencies. Former employees were located and extensive telephone interviews were subsequently conducted with former employees of both the bottling facility and the AST bulk fuel terminal. Through these interviews, former environmental consultants were identified and historical reports were obtained and reviewed, leading to the identification and removal of two leaking USTs and the assessment and remediation of hydrocarbon impacted soils and groundwater.

11. Surplus Government Real Estate Management Agency All States

Primary author of the Environmental Auditing and Property Divestiture\Acquisition section of a guidebook prepared for a surplus government real estate management agency. Subsections included Standards of Practice, Purpose, Use and Limitations of ASTM E 1527-94 and Checklists, Difference Between Phase I ESAs, Environmental Audits and Due Diligence, Related Federal Regulations, Components of a Phase I ESA, Procurement of Owner\Operator Provided Records, Scheduling of Regulatory Agency File Reviews and Interviews, Use and Limitations of Environmental Search Consultants, Environmental Regulatory Agency Databases and Local Governmental Agency Information Sources; Conducting Site Reconnaissance Inspections of the Interior and Exterior Facilities and Grounds and the Interviewing of Owners, Occupants and Local Government Officials; Evaluation and Report Preparation.

12. Steel Mill Texas

Assessed regulatory and permit compliance status of a 200-acre portion of an inactive steel mill preparing for divestiture. Compliance issues reviewed included NPDES, RCRA, TSCA, ASTs, air, and groundwater and storm water management.

13. Shipyard Annex\Bulk Marine Fuel Terminal Texas

Conducted a Due Diligence Examination of 30 acres of property located adjacent to and used by a shipyard maintenance facility and a bulk marine fuel terminal.

14. Glass Manufacturing Facilities Texas and California

Conducted two "fast-tracked" Phase I Environmental Site Assessments in accordance with ASTM E1527-94 on 15-acre glass manufacturing facilities. Regulatory record reviews identified the assessment and partial remediation of lead-impacted soils.

15. Multiple Real Estate Developers Texas and California

Conducted Due Diligence Examinations and Phase I Environmental Site Assessments for real estate developers of commercial, agricultural and residential properties.

16. Lumber Company North Carolina and South Carolina

Performed Phase I Environmental Site Assessments on three lumberyards prior to property divestiture.

17. Hospitals Texas

Senior Technical Reviewer\Project Manager for Phase I Environmental Site Assessments of two psychiatric hospitals. In addition to meeting ASTM E 1527-94 for environmental site assessments, the project also included a review and evaluation of hazardous chemical usage and solid and medical waste management practices.

18. Apartment Complexes Texas

Conducted two "fast-tracked" Phase I Environmental Site Assessments at apartment complexes in accordance with ASTM E 1527-94 standards.

19. Financial Institution\Apartment Complex Texas

Conducted a Phase I ESA in accordance with ASTM E 1527-94 on a 4.3-acre parcel of land improved with four two-story apartment buildings, two laundry buildings and a storage room. The Phase I ESA included a review of the property's prior use history, a review of neighboring properties based on environmental databases, a visual inspection for hazardous material impacts, a preliminary screening for asbestos-containing materials, radon, lead-based paint and lead in drinking water. The Phase I ESA also included an evaluation of above ground storage tank usage, underground petroleum storage tank usage, urea formaldehyde foam insulation and PCB-containing electrical equipment.

PROJECT DESCRIPTIONS:

**SOIL & GROUNDWATER INVESTIGATIONS
REMEDICATION & STRATEGIC PLANNING
AGENCY PERMITTING AND NEGOTIATIONS
WASTE MANAGEMENT
PROJECT, SITE & SUBCONTRACTOR MANAGEMENT
CLIENT RELATIONS**

**1. Gulf Coast Refinery
South Texas**

**Project Management
Soil and Groundwater Investigation and Remediation**

Project Manager over hydrocarbon and product (nonene, toluene and benzene) spills that impacted soil and groundwater. Managed in-house and external staff and resources to execute fieldwork and generate soil and groundwater quarterly monitoring, investigation and remediation (bioventing) reports.

Oversaw project schedules and budgets, reviewed and edited reports in both technical and general QA\QC capacities. Generated monthly Project Labor and Expense Summary Reports for client review. Reduced aged receivables.

Trained corrective action staff in the development and use of basic databases, identification and use of appropriate Standard Operating Procedures, implementation of the QA\QC process in field methodologies and technical report generation. These efforts led to a marked improvement in the quality of deliverables to the client.

**2. Gulf Coast Refinery
South Texas**

**Project Management
Soil and Groundwater Remedial Investigation
Under TNRCC's RRR and TRRP**

Project Manager over a soil and groundwater remedial investigation that was conducted under an Agreed Order between the Client and the TNRCC.

Managed the field implementation of a TNRCC approved workplan, which required the delineation of the extent of the free-phase hydrocarbons in two areas of the refinery and the extent of the dissolved phase plume in four areas of the refinery. Areas investigated included the truck loading facility, an area adjacent to former grain silos and two separate areas within tank farms. Soil, groundwater and free-phase hydrocarbon samples were obtained and submitted to a fixed laboratory, a mobile laboratory or both. Analytes included volatile and semi-volatile organic compounds, MTBE, metals and specific gravity.

Prepared drilling\strataprobe and mobile laboratory subcontractor scope of work\specifications and subcontract documents. Procured material and equipment required to execute the project. Developed a Daily Report (Excel) template and tracked the daily costs and field activities, including direct labor costs, material and equipment costs, out-of scope items, drilling, surveyor and laboratory costs.

Trained corrective action staff (two geologists and one technician) in basic QA\QC principles, practices and standard operating procedures for fieldwork and field reporting, including utility clearance documentation. Set up field personnel with field kits that had all necessary logbooks, work plans, paperwork, etc. required to efficiently execute the remedial investigation.

Provided QA\QC oversight of the field program, which included drilling, soil, groundwater and hydrocarbon sampling, water and hydrocarbon level measurements, field documentation and mobile and fixed laboratory analysis. Coordinated with the laboratories on a daily basis to review and correct COCs prior to submittal, after submittal and to decide whether certain samples were to be analyzed, held or released for analysis pending receipt of data from previous analyses.

Maintained daily client and subcontractor contact, prepared change orders and change of scope documentation as appropriate. Reviewed, revised as necessary and provided approval for weekly project progress reports, draft and final invoices, subcontractor invoices, equipment and material purchase receipts and rental invoices, timesheets and expense reports prior to client submittal.

Evaluated data and generated maps to show results of mobile lab analyses for the four areas under investigation. Using the field geologists' input, generated maps showing proposed locations of additional delineation borings. Compiled a preliminary database and generated sorts of the fixed and the mobile laboratory data to provide the status of delineation in each area.

H. DARLENE VENABLE

3. **Gulf Coast Refinery South Texas** **Groundwater Remediation - Project Management Hydrocarbon Free-Phase Recovery**

Reviewed and revised as necessary, draft invoices, final invoices, daily field reports, vendor invoices and backup prior to client submittal. Reviewed and revised as necessary, weekly project progress reports.

Provided project management oversight to a geologist and a technician for the calibration, monitoring and maintenance of recovery well systems and the quarterly measurement of hydrocarbon thickness and water levels within each well.

QA/QC'd Quarterly Hydrocarbon Production Reports (text, maps and tables) prior to client submittal.

4. **Decommissioned Crude Oil Tank Farm South Texas** **Soil Investigation and Remediation Facility Investigation Report & Strategic Planning**

Co-authored the Facility Investigation Report under the Texas Railroad Commission regulations.

Compiled a basic database of and oversaw the data entry of historical analytical data from over five different consultants to facilitate the use of the Texas Risk Reduction Rules to reduce the soil remediation volume by one-tenth of the previous volume. Database fields included a unique site area reference, consultant, analytical laboratory, sampling date, media, x and y coordinates for Surfer importation, analyte, concentration, units and a map reference number.

Oversaw the development and issuance of the revised subcontractor's scope of work.

5. **Former Aerospace Manufacturing Facility North Texas** **Remediation - Response Action Work Plan In Situ Chemical Oxidation of TCE Contaminated Soils**

Co-authored the Response Action Work Plan (RAWP) for the in situ chemical oxidation of soils at a former aerospace manufacturing facility using Texas Voluntary Cleanup Program guidelines. Processes conducted at the facility included the following: machining, milling and etching of metal parts, bonding metal and synthetic materials, parts assembly, welding, painting and heat treatment. Trichloroethene (TCE) was used for degreasing until 1987 and is believed that the storage and use of degreasers resulted in TCE contamination of soil and groundwater.

Direct in-situ chemical oxidation was selected to remediate the chlorinated hydrocarbons. Petra's DRIS (Deep Remediation Injection System) technology was selected because it has a delivery system capable of injecting remediation agents and air into low permeability soils and groundwater. The delivery system for the injectate was critical because of the low permeability of the impacted soils. The DRIS system is a high pressure, low volume injection system that can inject remediation agents at pressures up to 5,000 pounds per square inch, sufficient to create micro-fractures in soils with low permeability. Remediation agents to be injected include ferrous sulfate (1% solution), hydrogen peroxide (up to a 17% solution), phosphoric acid (1% solution) and a surfactant.

Prepared the initial Scope of Work and Subcontract Agreement between the consultant and the In Situ Chemical Oxidation Subcontractor. Generated an internal memo to the Project Manager detailing geotechnical concerns at sites where in situ chemical oxidation is used to remediate TCE contaminated soils in structural fill and native soils beneath concrete floor slabs and near spread or deep footings.

6. **Military Ammunition Depot Western United States** **Remediation Project Manager Mercury/Asbestos Abatement**

Managed a mercury/asbestos abatement and demolition project on a building at an active ammunition depot in the Western United States. The structure was built in the 1940's, had asbestos (transite) roof shingles, stored various types of inventory (including mercuric chloride batteries), and caught fire. The fire and subsequent fire suppression efforts collapsed sections of the friable transite roof and deposited mercury onto the surfaces of the material stored within the building.

Procured and wrote scopes of work for all Subcontractors (mercury abatement, asbestos abatement, hazardous waste and non-hazardous wastestream characterization, transportation and disposal, laboratories, recyclers, industrial hygienists and health and safety monitoring). Obtained all appropriate local business licenses and state environmental operating permits.

7. Major Oilfield Equipment Manufacturing and Maintenance Facilities TX, NM, ND, MT, MS, OK, LA, KS and CO **Site\Project Management, Site Assessments, Remediation, Waste Management**

Litigation Support, Environmental Policy, Regulatory Compliance\Permitting

Provided litigation support to the legal firm representing the Client; maintained legally defensible project documentation (field and administrative).

- Reviewed the Client's environmental policy with operation managers at satellite facilities.
- Negotiated clean up levels and remedial alternatives with state regulatory agencies. Reviewed environmental improvement project designs generated by subcontractors and in-house engineers for compliance with state and local environmental regulations.
- Obtained permits for upgrading existing environmental equipment and for the installation and construction of environmental improvement projects such as closed loop wastewater treatment systems, flow-through process tanks, ASTs, USTs, sanitary leach fields and painting and welding stations.

Proposals, Work Plans and Technical Report Writing

- Wrote proposals and developed work plans to guide voluntary and regulatory agency driven soil and groundwater investigations, waste management and remediation for facilities in 10 states.
- Prepared feasibility studies, which identified potential strategies for the remediation of hydrocarbon impacted sites. Authored site investigation work plans and implemented corresponding field programs for the delineation of vertical and lateral extent of contamination resulting from releases of hazardous and industrial wastes into soil and groundwater.
- Prepared the final technical reports for the soil and groundwater assessments and for the remediation and closure of the facilities.

Waste Management

- Generated waste volume estimates for the development of remedial alternatives, performed a cost analysis of waste disposal options and obtained waste codes, waste disposal permits and transportation permits.
- Conducted regulatory compliance audits of waste disposal facilities prior to use by the Client. Negotiated waste disposal contracts on behalf of the Client resulting in \$50,000 of cost savings to the Client.

Site\Project Management

- Managed field operations and evaluated competitive bids of drilling, construction, geotechnical and remediation contractors during all phases of investigation and remediation of non-hazardous and hazardous waste disposal pits, USTs, ASTs, industrial leach fields, leaking sump systems, inadequately installed drinking water wells and spills to surface soils.

8. Bauxite Processing Facility Texas

Site Management: Soil, Groundwater & Geotechnical Investigation NPL Site, TNRCC

Site Management

- Site Manager and Lead Geologist for a TNRCC ordered monitor well installation program conducted at a several thousand-acre bauxite processing facility. The field program included the installation of 60 monitor wells and 10 double cased wells by mud rotary and hollow stem auger drilling methods. The field program also included the plugging and abandonment of 30 monitor wells.
- Supervised a geologist, technician, health and safety officer, six drilling personnel, three plant designated waste handlers, surveyors and heavy equipment operators.
- Scheduled and implemented a geotechnical and hydrogeological work plan in support of a solid waste management unit permit application.
- Scheduled, implemented and assisted in the development of a dewatering work plan for a SWMU containing caustic fluids (pH 14) in order to meet the pre-closure requirements of the TNRCC. Field activities included the installation of five recovery wells that were completed with five windmills in lieu of submersible pumps.

Technical Report Writing

- Compiled a comprehensive database of lithologic logs, monitor well construction details, geotechnical testing data and results of chemical analyses from several decades of environmental and geotechnical investigations conducted throughout the facility.

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9. Decommissioned Solvents\Plastics Manufacturing Facility Texas

RCRA Facility Investigation Strategic Planning: Corrective Measures Study

Site Management

- Implemented a soils, sediment and groundwater quality work plan for a Background Facility Investigation.
- Implemented a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Property Divestiture Work Plan (Phase II) for a decommissioned 405-acre plastics\solvents manufacturing facility.
- The RFI work plan included the assessment of surface and subsurface soils, storm water drainage ditch sediments and groundwater quality of 65 waste management units, 26 of which were Solid Waste Management Units (SWMUs) designated under the facility's RCRA permit. Site geology and hydrogeology were characterized and a tidal influence study was conducted.
- Site Manager and Lead Geologist for a four month RFI that included the installation, development and sampling of 43 single, double and triple cased groundwater monitor wells by hollow stem auger and mud rotary drilling methods and for the installation and sampling of 222 exploratory soil borings.
- Four hundred-forty (440) soil, sediment and waste samples and 56 groundwater samples were obtained and submitted to an approved laboratory for priority pollutant analysis.
- Supervised two (three-man) drilling contractor crews and a multidisciplinary team of 10 professionals including geologists, engineers, surveyors and technicians.

Contract Negotiation

- Negotiated contracts with drilling contractors and hotel vendors, which resulted in \$86,500 of cost savings to the Client over a one-year period.

Technical Report Writing: Background Facility Investigation, RFI, and Corrective Measures Study

- Primary author of the Background Facility Investigation technical report that was submitted to the Texas Natural Resource Conservation Commission (TNRCC) on behalf of the Client.
- Co-authored the RFI technical report that was submitted to the TNRCC. Investigation results were compared to health based criteria established for the site in preparation for the divestiture of the leased property. The RFI report requested that the SWMUs be closed under Standard 2 of the TNRCC Risk Reduction Rules.
- Prepared and submitted a preliminary corrective measures study to the Client detailing alternatives for remediating a SWMU containing asbestos, lead, mercury and industrial trash.

10. U.S. Naval Base Realignment Site Naval Shipyard, California

ISTD Soil Remediation of PCBs CERCLA, TSCA

Assisted in site management and start-up of the ISTD system at a California EPA Superfund site. PCB oils had been released to soils from a grease trap and underground drains located adjacent to a former electrical maintenance shop. PCB concentrations were localized in the upper 12 feet of the soil and affected approximately 120 cubic yards of soil.

PCB concentrations were reduced from 2200 ppm to less than 0.033 ppm, meeting the remediation objective of less than two ppm total PCBs.

The primary ISTD system components included Thermal Blankets, Thermal Wells, a cyclone separator, a flameless thermal oxidizer, two carbon beds and a stack.

11. Military Ammunition Plant Kansas

RCRA Facility Investigation Quality Assurance Plan Review

Reviewed a Quality Assurance Plan (QAP) and Addendum for a Military Ammunition Plant on behalf of the EPA using the agency's "RCRA Corrective Action Plan Checklists for RCRA Facility Investigations, No. 2 – RFI Work Plan." The work assignment included reviewing the Consultant's QAP and Addendum for the existence of and detail within all of the components specified in the EPA's RCRA Corrective Action Plan Checklists. These components included the Project Management Plan, Data Collection and Quality Assurance Plan Requirements, Field Operations, Laboratory Operations, Data Management Plan, Health and Safety Plan and a Public Involvement Plan.

12. Naval Facility Centerville Beach Centerville Beach, California

ISTD Soil Remediation of PCBs
CERCLA, TSCA, RWQCB, DTSC, HCDEH, AQMD, CALEPA (OPPT), CCC

Project Geologist, Permit Procurement, Technical Review, and Preparation of Drilling Specifications and Subcontractor Management

Reviewed the Client's Request for Proposal and identified data necessary to successfully install the ISTD wells. Authored the Drilling Specification Package that included the following sections: General Scope of Work, Site Description (Project Overview), Restricted Access Areas, Site Geology, Site Hydrogeology and Contaminant Distribution. The Scope of Work components included Mobilization and Demobilization, Borehole Drilling and Vacuum Heater Well, Heater, Pressure Monitoring Port and Thermocouple Installation and Removal, Regulatory and Permit Requirements, Equipment Decontamination, Waste Management, Site Restoration and Health and Safety.

Permitting: Drilling, Coastal Zone, ISTD Certification

- Submitted a drilling permit application to the Humboldt County Department of Environmental Health (HCDEH) for the installation of heater vacuum wells, heaters, thermocouples and pressure monitoring ports. This application complied with Water Well Standards (Bulletin 74-81) and California Well Standards (Bulletin 74-90) of the California Department of Water Resources and the requirements of the HCDEH Hazardous Materials Unit Policy for Monitoring Well/Boring Permits. Procured drilling permits from the HCDEH and negotiated a 50 per cent reduction in the drilling permit fees.
- Submitted a "Negative Determination Concurrence" request to the California Coastal Commission (CCC) pursuant to Section 15 CFR 930.35(d) of the NOAA regulations for the implementation of the ISTD system at the Centerville Beach Naval Facility. Upon agency concurrence, the ISTD remediation would be classified as non-developmental and have the permit requirements waived.

Procured a "Negative Determination Concurrence" letter from the CCC within five days of the submittal of the initial request.

- Co-authored TerraTherm's "Application for Certification" in the California Environmental Technology Program implemented by the California Environmental Protection Agency, Department of Toxic Substances Control and the Air Resources Board. As part of the application process, TerraTherm was required to demonstrate the effectiveness, reliability and protectiveness of the ISTD System. To do this, TerraTherm prepared a technical document with the following environmental technology verification protocols: Technology Description, Operation and Maintenance Procedures, Performance Claims, Supporting Scientific and Engineering Basis, Operating Envelope, Operator Requirements, Worker Safety Issues, Monitoring and Control of Operating Conditions, History of Accidents, Environmental Aspects, Existing Data, Verification Plan for the Collection of New Data, Implementation of the Verification Plan and Completion of the Verification Report and the Completion of an Evaluation Report by CALEPA.

Drilling and Subcontractor Management

- Managed the drilling contractors during the installation of heater vacuum wells, heaters, thermocouples and pressure monitoring ports. Simultaneously supervised the drilling crews, logged boreholes, measured individual well screen and heater lengths and interacted with visiting regulatory agency and newspaper representatives. Installed 61 subsurface ISTD system components in 10 days.
- Supervised three drilling crews during the well installation phase of the ISTD system mobilization. Subsurface ISTD components were installed in a hexagonal pattern on 6-foot centers using hollow stem augers, solid flight augers and direct push techniques utilizing hand levels to maintain and verify the verticality of all installations. A CME 85 and CME 45 was used to install 11 heater vacuum wells, 24 heaters, eight thermocouples, one heater\pressure port dual installation and two pressure ports in areas of unrestricted access within the treatment zone to depths of 17 to 17.5 feet below ground surface.
- A CME 45 and a customized limited access rig installed five heater vacuum wells, 11 heaters, two thermocouples and two pressure ports in restricted access areas of the treatment zone. These installations were located within one foot of the exterior building walls and in a building with an overhead clearance of nine feet, six inches and were installed to depths of 17 to 17.5 feet below ground surface.

Heaters were constructed of 3-1/2-inch diameter stainless steel and heater vacuum wells were constructed of 4-inch diameter stainless steel wire wrapped screen. Thermocouples and pressure ports were constructed of one-inch diameter carbon steel.

- Generated lithologic logs of all boreholes and obtained and submitted selected soil samples for pre-treatment analysis of polychlorinated biphenyl (PCB) concentrations and moisture content. The field data and energy balance data enabled critical adjustments in the heating and dewatering strategy to be made so that the project was completed on schedule in spite of a very wet winter.

**13. Major Oilfield Equipment Manufacturing/Maintenance Facility
Texas**

**Site Management
Soil and Groundwater Investigation
Remediation, Waste Management**

Site Management: Assessment and Remediation

Supervised all onsite operations including the management of the Client's employees and subcontractors during the accelerated divestiture-driven closure of a 15-acre oil and gas equipment manufacturing facility. Areas investigated and remediated included the former pipe processing areas, pipe inspection areas, pipe storage areas and wastewater sumps and drainage ditches.

- Scheduled and supervised the field activities of technical personnel and assessment, remediation and construction contractors. Remediation and assessment activities were executed concurrently.
- The Phase II and III of the field program included the following:
 - installation and lithologic logging of 50+ soil borings by Geoprobe® and hand-auger methods,
 - sampling and chemical analyses of 500+ soil samples for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals,
 - excavation and construction of three concrete sumps and
 - excavation and disposal of 3500+ cubic yards of hydrocarbon and metal impacted soils.

Waste Management

- Phase I activities included general facility cleanup, sampling, packaging, profiling and offsite disposal of 180 drums of solid and liquid hazardous and non-hazardous wastes and recyclable materials.
- Provided oversight and coordinated the sampling, analysis of wastes for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP SVOCs, TCLP metals and Reactivity, Corrosivity and Ignitability (RCI).

Proposals, Work Plans, and Technical Report Writing

- Developed soil and groundwater assessment work plans after the excavation of visibly impacted surface soils.
- Primary author of final technical report for the onsite assessment (confirmatory sampling and analyses) and remediation and closure activities.

**14. Lead Reclamation Facility
Texas**

**Remediation: Feasibility Study, Strategic Planning
TNRCC**

Technical Report Writing

- Prepared and submitted a feasibility study to the TNRCC detailing remedial alternatives for four adjoining lead-contaminated sites. The feasibility study screened 14 remedial alternatives and selected five for detailed evaluation on technical merits, environmental and human health impacts, agency acceptance, schedule and economics.

Site Management: Assessment

- Installed and sampled soil borings and groundwater monitor wells during the assessment phase.

**15. Major Oil Companies
California and Texas**

**Leaking UST and PST Investigations
Soil and Groundwater Investigations
Monitoring and Remediation**

Work Plan Development

- Reviewed, scheduled and oversaw the implementation of comprehensive work plans for soil and groundwater quality investigations at fuel distribution facilities (leaking underground storage tank sites) in Texas.

Site Management: Assessment and Remediation

- Supervised and conducted subsurface soil and groundwater quality assessments, UST removals, impacted soil excavation and coordinated waste disposal efforts with transportation and disposal contractors in Texas.
- Implemented and/or supervised groundwater monitoring programs, soil remediation (excavation and land farming) and the preparation of technical reports for submittal to the TNRCC in Texas or the RWQCB and DTSC in California.

16. Electrical Motor Control Manufacturer Illinois

Remediation: RCRA Closure Plan Basis for Design\Final Design Report

Coordinated and co-authored TerraTherm's first RCRA Closure Plan, Basis for Design\Final Design Report (BDR\FDR) to perform In Situ Thermal Desorption (ISTD) treatment of soils impacted with trichloroethylene (TCE) and perchloroethylene (PCE) at an electrical motor control manufacturing facility.

The BDR\FDR was prepared in accordance with regulations contained in Illinois Administration Code, Title 35, Section 725.210 through Section 725.220, Subpart G, was submitted to the Illinois Environmental Protection Agency (IEPA) in December of 1997 and was approved in May of 1998 with a request for response to only several comments. Prior to its submittal to the IEPA, the document was submitted to facility managers, the corporate Health Safety and Environmental Manager, the Client's consultant and the Client's local legal representation for review and comment.

The BDR\FDR consisted of an Introduction Section providing background information including a process unit description, project objectives, assumptions and the scope of the project.

The BDR\FDR also consisted of the following sections: Existing Site Conditions, Remediation Objectives, Description of the ISTD System, Demonstration of ISTD Remediation Effectiveness, Estimated Time to Complete Remediation Effort, Identification of Design Criteria, Review of Available Information, Procedures for Completing the Design of the ISTD System, Required Permits, Long-Lead Procurement Considerations, Project Management, Project Schedule, Post-Remediation Verification Sampling and Analysis Procedures, Remediation and Post-Remediation Derived Waste Management and References. Attachments included three tables, six appendices and 18 figures.

17. Titanium and Magnesium Manufacturing Facility Nevada

Site Characterization, Soil and Groundwater Quality Environmental Conditions Investigation

Executed an Environmental Conditions Investigation at a 50-year old magnesium/titanium manufacturing plant.

Site Characterization Task Manager:

- Prepared detailed work specifications, evaluated bids and negotiated rates with drillers. Subcontractor management reduced the Client's drilling footage rates by approximately 25 percent.
- Installed over 100 soil borings and seven groundwater monitor wells in 10 working days using one hollow-stem auger drilling rig.

18. Government Agency New Mexico

UST Site Assessment Soil and Groundwater Field Sampling Plan Preparation

Conducted site reconnaissance for three UST sites. Information obtained during the reconnaissance of the UST sites was used to prepare site plans and detailed field sampling plans to execute soil and groundwater quality investigations in accordance with state and federal UST program guidelines. The sites were located in three distinctly different geological and hydrogeological regions of New Mexico.

19. Manufacturing Facility Texas

Soil and Groundwater Investigation Former LPST Site

Executed a soil and groundwater investigation on behalf of a prospective buyer as part of the Due Diligence Examination of a manufacturing facility. The facility had previously removed leaking petroleum storage tanks and had excavated hydrocarbon impacted soils.

Soil and groundwater samples were obtained using a Geoprobe[®] and in-situ groundwater sampling techniques and analyzed for VOCs, SVOCs and lead. The results of the investigation showed that the site had not been adequately remediated, a fact that allowed the prospective buyer to cancel the purchase.

20. Military Installation – Base Closure California

Ecological Risk Assessment Feasibility Study

Coordinated all document production requirements for the Phase 1B Ecological Risk Assessment of a Bay Area military installation. Document production responsibilities included technical editing, quality control reviewing of all appendices within the reports and managing of analytical data and report sections generated from four different offices and 10 different authors.

21. Military Installation California

Soil and Groundwater: Site Characterization

Field Sample Coordinator for a Background Investigation of soil and groundwater quality at an active military installation. Six borings were drilled to a depth of 75 feet below ground surface and sampled using a hollow stem auger drilling rig and a continuous split spoon and Shelby tube samplers. Groundwater samples were obtained using bailers and HydroPunch® in situ groundwater samplers. Soil samples and groundwater samples were obtained and submitted to four different offsite laboratories for chemical, biological and geotechnical analysis on a daily basis. To enhance field production rates, sample tracking and quality control, all sample labels were preprinted prior to field mobilization and sample container sets were prepared for each boring and depth interval slated for sampling and analysis.

22. Former Oilfield Pipeyard and Salvage Facility Texas

Soil and Groundwater Investigation NORM, Waste Management TNRCC, TDH, Brownfield

Primary author of the Project Work Plan and Field Sampling Plan (FSP) for the initial soil and groundwater site characterization phase of a 15.5-acre Brownfield site formerly operated as an oilfield pipeyard and salvage facility.

The FSP included a radiological survey for naturally occurring radioactive materials (NORM), historical aerial photograph procurement and interpretation, and subsurface soil sampling, soil stockpile sampling, wastewater and sludge sampling drain sampling and groundwater sampling. These samples were analyzed for PCBs, TPH, VOCs, SVOCs, pesticides and herbicides, metals, TCLP metals, TCLP VOCs, TCLP SVOCs and RCI analysis. A preliminary wetland determination was also required.

The Work Plan and Field Sampling Plan were developed to meet the requirements of the Client and the data needs for site closure under the Texas Risk Reduction Rules (Standard 2 or 3), Texas Department of Health (TDH) regulations and municipal regulations. The Work Plan\FSP received few comments upon agency submission.

Prepared detailed work specifications for the procurement of drilling contractors, land surveyors, analytical laboratories, NORM surveyors and waste management (transportation and disposal) contractors.

23. Bulk Fuel Storage Facility Oregon

Remediation: Soil and Groundwater In Situ Thermal Desorption Hydrocarbon Free-phase Recovery

Assisted the ATL hydrogeologist with the design and implementation of the dewatering and remediation of a one-acre site contaminated with refined petroleum products. The project used approximately 300 heater vacuum wells and 600 heater wells to remediate free-phase hydrocarbon and benzene from soil and groundwater.

Hydrogeological site characterization and laboratory analyses identified two aquifers, an unconfined surface aquifer within the contaminated zone and an underlying confined aquifer. To minimize lateral recharge of water, liquid ring pumps and a series of above ground piping and downhole tubing were used to dewater the uppermost aquifer by pumping from the heater vacuum wells prior to system startup. The underlying aquifer was pumped down using perimeter dewatering wells prior to and during remediation to prevent recharge from below the treatment zone.

24. Department of Defense\Army Corp of Engineers Former Capacitor Storage Area Saipan, Commonwealth of Northern Mariana Islands

Soil Remediation Ex Situ Batch Application of the ISTD System CERCLA, TSCA

Served in the capacities of Project Geologist, Site Manager, Operator, Site Health and Safety Officer and Site Soil Sampling QC Officer during the implementation of the ISTD System on Saipan. The Client had stockpiled approximately 1,000 cubic yards of PCB impacted soil, which dated to WWII and had originated from capacitor storage areas located throughout Saipan. Pretreatment concentrations of PCBs ranged between 2 and 29,000 ppm. Remediation objectives of less than 1 ppm PCBs were met. TerraTherm was awarded the United States Army Corps of Engineers Technology Merit Award for this project.

The impacted soils were heated using an ex-situ application of the ISTD System, utilizing the Thermal Blankets in "batches" of approximately 42 cubic yards. The PCB impacted soils were placed in insulated open-topped metal boxes (20 feet by 56 feet) and evenly compacted to a thickness of approximately one-foot. Radiators were installed and the soil was then covered with seven Thermal Blankets (8 feet by 20 feet each) and heated to 600°F for approximately 48 to 72 hours. The duration of the treatment cycle depended upon soil density, moisture content and power availability. Air controls included secondary and tertiary treatment of the off gases using a flameless thermal oxidizer and carbon beds.

Project Geologist

- Collected, analyzed and posted to the TESI computer network process data, thermal data, daily reports and photo logs.
- Reviewed computer printouts and raw field data from the previous shift, conducted quality assurance checks and input the data into the Microsoft Excel ISTD database system. Primary worksheets included the raw data, bottom thermocouples, in-soil thermocouples and blanket control thermocouple data. Secondary databases included power consumption and a miscellaneous information database.
- Generated Thermal Maps (in Surfer[®]) showing the progress of the treatment system in 12-hour intervals.
- Reviewed the process data to evaluate the operating parameters of the ISTD system such as flow percentages from the field, detection air and daily power consumption. Reviewed the process computer data (WonderWare Software) for patterns in the oxidizer cycles, levels of THC, O₂, and CO₂, and the rate of temperature increase of the heater elements from the Watlow controllers.
- Reviewed the Site Demobilization Plan and generated a preliminary Waste Management Plan for demobilization.

Site/Construction Management

- Coordinated onsite field efforts of seven TESI employees, seven construction/earthwork contractors, three welders and up to six electricians.
- Maintained shipping\receiving documentation and generated purchase orders for the procurement of equipment from the U.S. and Saipan.
- Procured and managed Saipan subcontractors such as welders, construction laborers, earthwork contractors, equipment rental vendors, crane operators, construction material vendors, electricians, metal fabricators, machinists, health and safety supply vendors and brick makers.
- Conducted the daily operations meetings.
- Supervised the removal of the blankets, radiators and treated soils.
- Supervised the assembly of the cells prior to cell energizing and de-energizing and supervised soil placement, soil compaction and thermal radiator installation.

QA/QC Field Sampling Officer

- Provided quality assurance/quality control during the pre-treatment and post-treatment sampling of soils.
- Set up and maintained the Excel Sample Database, which included fields such as Client Batch Number, TESI Run Number, Sample Identification Numbers, Sample Date, Sample Type, Sample Shipping Date, Chain of Custody Number, Analytical Report Date, Results, Burn Dates, Sample Disposition, Average Concentrations and Soil Moisture.
- Conducted soil moisture tests on pre-treatment samples.
- Reviewed laboratory reports of the analysis of pre-treatment and post-treatment soils. Identified suspect analytical data and coordinated corrective actions.
- Trained two crews in standard operating procedures for collecting discrete and composite samples from soil within the cells and stockpiles and provided oversight during the decontamination of sampling equipment and earthwork equipment.

Health and Safety Officer

- Maintained daily health\safety records that included the following: air monitoring by MiniRam, heat stress monitoring, daily health and safety meetings, hot-work permits, use of torches, health and safety training and medical monitoring reviews, lock-out/tag-out procedures, compressed gas cylinder handling, vehicle traffic, heavy equipment use, maintenance and troubleshooting, use of hand tools, power tools and ladders, forklift and crane operations, confined space, noise, fire prevention, electrical equipment use, slips, trips and falls, incident reporting, buddy system, PPE use, site control, decontamination, emergency response plans, project hazard analysis and chemical hazards.

H. DARLENE VENABLE

- 25. Former Wood Treating Facility and Truck Parts Facility** **Soil and Groundwater Investigation**
Texas **Waste Management**
TNRCC, TDH, Brownfield
- Authored the project Work Plan and Field Sampling Plan for the initial soil and groundwater site characterization phase of 5.3 acres of vacant Brownfield property. The site was the location of a former wood treating facility that operated from the late 1920's to the middle 1950's.
- The Work Plan and Field Sampling Plan were developed to meet the requirements of the Client, the data needs for site closure under state regulations (Texas Risk Reduction Rules Standard 2 or 3) and municipal regulations. The Work Plan\FSP received few comments upon agency submission.
- Prepared detailed work specifications for the procurement of drilling contractors, land surveyors, analytical laboratories, geophysical surveyors and waste management (transportation and disposal) contractors.
- The site characterization included historical aerial photograph procurement and interpretation, geophysical surveying using an EM31 and a magnetometer, surface and subsurface soil sampling and groundwater sampling for TPH, total arsenic, chromium, copper, lead, mercury, SVOCs such as phenolics, pentachlorophenol and polynuclear aromatic hydrocarbons and VOCs.
- 26. Liquid Petroleum Storage Facility** **Soil and Groundwater Investigation**
Kansas **Work Plan\Closure Plan**
KDHE
- Prepared a state agency (KDHE) approved work plan and obtained state regulatory agency approval for a soil and groundwater quality investigation and for the closure of two cavern wells used for liquid petroleum storage. Areas of investigation included the assessment of impacts to soil and groundwater quality from chemical releases of ASTs, pipelines and gas compression facilities. Developed a management and disposal plan for onsite wastes.
- 27. Major Natural Gas Transmission Company** **Waste Stream Characterization**
Kansas **Soil Investigation**
KDHE
- Prepared a waste stream characterization study and implemented a soils investigation and at a compressor station undergoing decommissioning. Areas of concern included cooling tower sediment (chromium), compressors (lubrication oils, PCBs), USTs, glycol-based fluids and other treating chemicals.
- 28. Major Bottling Company** **Leaking AST-Bulk Fuel Terminal\UST**
Colorado **Soil and Groundwater Quality Investigation (Historical Data Review)**
Remediation
- Managed, proposed and conducted a preliminary soils and groundwater quality review of historical data at an abandoned bottling facility, a portion of which was formerly the site of a 70-year-old AST bulk fuel terminal. Additional onsite USTs and hydrocarbon releases were identified during the investigation. USTs and hydrocarbon-impacted soils were subsequently excavated and disposed of at an offsite disposal facility.
- 29. Petrochemical Company** **Plant Expansion, Wetlands Permitting**
Texas **ACE**
- Field geologist for a wetland determination, permitting and construction project on a fast-tracked multi-million dollar plant expansion schedule.
- 30. Herbicide Manufacturer** **Soil Investigation**
Texas **TWC**
- Developed a sampling plan and conducted soil sampling prior to the proposed acquisition of the property by the Client. Sample locations were selected from areas exhibiting distressed vegetation. Soil samples were obtained using surface sampling and hand auguring techniques and were submitted to an offsite laboratory for herbicide analysis.

H. DARLENE VENABLE

- 31. Major Real Estate Developers** **Geological\Geotechnical Foundation Studies**
California **Orange and LA County Agencies**
- Site Manager for the implementation of geological\geotechnical foundation studies required for the permitting/development of retail shopping centers. Conducted ASTM field and laboratory testing of engineering properties of soils.
- 32. Decommissioned Pre-cast Concrete Fabrication Facility** **Waste Management**
Texas **RCRA**
- Developed a preliminary waste characterization and disposal plan for a decommissioned 50-acre site preparing for property divestiture.
- Inventoried, staged and sampled abandoned materials including hazardous chemicals, etching acids, oils, epoxies, paints and miscellaneous solid wastes for waste stream characterization and disposal alternative reviews.
- 33. Printing and Graphics Facility** **UST and Groundwater Assessment**
Texas **TWC**
- Project\Site Manager responsible for reviewing historical technical reports and developing and implementing work plans to assess the impact of releases of ink/solvent wastes from two USTs into soil and groundwater. Field activities included the installation of soil borings and the sampling of soil and groundwater.
- 34. Glass Manufacturing Facility** **Subsurface Soils Investigation**
Texas **TNRCC's RRR**
- Generated a scope of work, cost estimates and developed and implemented a subsurface soil quality investigation for lead, in accordance with Standard One closure guidelines of the TNRCC Risk Reduction Rules.
- 35. Pharmaceutical Manufacturer** **RCRA Facility Investigation**
Texas **Soil, Sediment, Waste**
- Field geologist for a facility-wide RFI during the soil investigation and waste characterization phases. Conducted sediment and waste sampling in lagoons, installed soil borings and obtained subsurface soil samples.
- 36. Real Estate Mortgage Company** **Waste Management**
Florida **FDEQ**
- Developed a work plan to characterize, transport and dispose of wastes abandoned in a multi-unit warehouse in the aftermath of Hurricane Andrew. Wastes included solvents, paints, epoxies, oils and non-hazardous solid wastes.
- 37. Retail Center/Dry Cleaner** **Project Management, Strategic Planning**
Texas **Soil and Groundwater Investigation**
TNRCC Voluntary Cleanup Program
- Project Manager and Proposal Manager for a Retail Center Client facing litigation from a neighbor alleging that the Retail Center's dry cleaner had impacted offsite soil and groundwater quality. The Client was entered into TNRCC's Voluntary Cleanup Program and was kept out of litigation. Consultation included preparing proposals and retaining the services and coordinating the efforts of an environmental attorney\professional engineer and a nationally recognized DNAPL expert.

**Alexander Paul Macbeth, PG
Project Manager and Geologist****Education**

MS, Geology, University of Vermont, Burlington, 1989
BS, Geology, Florida State University, Tallahassee, 1986

Professional Licenses

Professional Geologist, Florida, #1933, 1996
Professional Geologist, Tennessee, #2559, 1992
Professional Geologist, Georgia, #1027, 1993

Experience Summary

Mr. Macbeth's primary role from 2000 to middle 2005 has been the chief project manager for the Total Environmental Restoration Contract (TERC) 3 and ERSC work at Eglin Air Force Base, Florida. He has been working at Eglin since March 1995. Most of the work has been with the Eglin Installation Restoration Program (IRP) and has consisted of assessments and remediation of impacted media (soils, groundwater, sediment, and surface water). Over the past five years, this work has entailed more than 150 sites. Mr. Macbeth joined the Eglin team as the field manager, then managed several projects within specific delivery orders, before being assigned chief project manager in October 1999. Currently, Mr. Macbeth has just finished taking a few months off to teach middle school science. He is supporting several of the DOD and FDEP projects in Florida.

Project Experience

US Army Corps of Engineers - Omaha District, ERSC - Phase I Environmental Site Assessment (LPV 105-111), New Orleans, Louisiana. Project manager for a Phase I ESA to investigate the potential presence of hazardous, toxic, or radioactive waste (HTRW) in the vicinity of the proposed construction to ensure that suitable and safe fill materials are used for levee rehabilitation and improvement to the flood protection system. [11/2006 - 03/2007]

US Army Corps of Engineers - Omaha District, TERC 3 Active Delivery Order Nos. 12, 15, 18, 20, 23, 26, 10, 11 Eglin AFB, Florida. Chief project manager for a greater than \$20 million contract for preliminary assessments and site investigations, risk assessments, interim corrective measures, corrective measures studies, and remediation at more than 150 sites on Eglin Main Base and Reservation. Manages work at oil/water separators, former surface and/or subsurface disposal areas, test ranges, fuel or solvent spill locations, cattle dipping vats, and water towers. Supervises assessments of oil and groundwater quality, as well as sediment and surface water in several drainages on Eglin Main Base. Contaminants addressed include petroleum products, chlorinated solvents, metals (particularly lead and arsenic), dioxin, and depleted uranium. Coordinates with Eglin EOD to clear sites of UXO. Direct excavating and disposing soil off site (soil impacted with arsenic, lead, PAHs, pesticides, or uranium), capping with a soil cover, and improving site habitat by installing erosion control and planting vegetation. Involved with all phases of the work, including the preliminary assessment and investigative field work, remediation field work, data management and interpretation. Senior author on all Eglin reports and work plans. Interacts closely with Eglin, USACE, regulators (EPA, FDEP, FDOH, and NRC), and subcontractors, including Bhatte Environmental.

Florida Department of Environmental Protection, St. Marks Refinery Site Assessment, St. Marks, Florida. Lead field geologist in performing large-scale site assessment of 80 acre former oil refinery. The investigative work included soil sampling, monitoring well installation, wetland (surface water and sediment) sampling. Played large role in evaluating data and developing report. [07/2004 - present]

Confidential Client, Ordnance Explosive (OE) Scrap Removal, Camden, Arkansas. Project Manager for a \$350,000 characterization and removal of UXO/OE scrap at a 10-acre site within the former Shumaker Naval Ammunition Depot (NAD). Directed a visual reconnaissance to determine explosive hazards associated with the site, a characterization of the extent of buried OE Scrap using surface geophysical techniques, and

excavation and off-site disposal of approximately 600 cubic yards of OE scrap, and associated solid waste and construction debris. Also collected soil and groundwater samples to evaluate the presence of residual contamination caused by the OE scrap and solid waste.

Confidential Client, Phase I and II Investigation, Pensacola, Florida. Project manager for a Phase I and large Phase II investigation at an electrical generator manufacturing facility that was being sold to a new operator. Phase II was a \$175,000 project and included extensive soil, sediment, surface water, and groundwater sampling. Project included very rapid response times to meet client's needs.

US Army Corps of Engineers, Site Inspection, Fort Gillem Army Depot, Atlanta, Georgia. Site manager for a site inspection of unsaturated soil and groundwater contamination near an abandoned sewage treatment plant. Managed field activities, which included a passive soil gas survey, auger and air rotary/air hammer drilling, installation of soil and bedrock monitoring wells, and soil and groundwater sampling. Evaluated, interpreted, and presented hydrogeologic and chemical data for report. Author of work plan and report for project.

Confidential Client, Groundwater Remediation, Spartanburg, South Carolina. Site manager for the design and installation of the second phase of a groundwater extraction system at an active fiber-producing plant. Managed design, construction, and installation of overburden and bedrock extraction wells to effectively capture and contain contaminated ground water from migrating off-site. Directed design and installation of observation and monitoring wells to monitor system performance. Author of report for project.

US Army Corps of Engineers, Supplemental Remedial Investigation/Baseline Risk Assessment, Redstone Arsenal, Huntsville, Alabama. Site geologist for part of a study conducted at three sites on Redstone Arsenal. Supervised the advancement of soil test boring to collect soil and groundwater samples for laboratory and geotechnical analyses.

Confidential Client, Groundwater Assessment, Greenville, South Carolina. Site manager for a groundwater quality assessment as part of a RI/FS at a closed fiber-producing plant. Supervised rock coring and reverse packer tests, groundwater sampling and installing monitoring and extraction wells using auger and coring drill methods. Contributed significantly to interpreting hydrogeological and analytical data and writing the RI/FS report.

Earth Tech Health & Safety Training

- 01 - Safety Orientation 02/01/2006
- 02 - Hazard Communication (US) /WHMIS (Canada) 12/19/2005
- 03 - Defensive Driving Awareness Training 12/16/2005
- 04 - Defensive Driving 4-Hour Course 12/22/2004
- 14 - Office Ergonomics Training 02/08/2006
- 15 - First Aid 08/09/2006
- 16 - CPR 08/09/2006
- 17 - DOT Level 1 Shipper/(TGD) Canada 02/01/2006
- 20 - HAZWOPER 40-Hour 02/02/1990
- 21 - HAZWOPER Refresher 8-Hour 01/26/2006
- 22 - HAZWOPER Supervisor 8-Hour 02/12/1993
- 23 - OSHA 10-Hour Construction Safety 06/01/2006
- 30 - Respiratory Protection Training 01/26/2006
- 31 - Hearing Protection Training 01/26/2006
- 34 - General Excavation Safety Training 01/27/2006
- 35 - Trench/Excavation Safety Training 01/27/2006
- 36 - Fire Extinguisher Training 01/25/2006
- C1 Fire Protection 12/23/2004
- C2 Bloodborne Pathogens 12/22/2004
- C2 Trenching and Excavation 01/27/2006
- ETUSA Southeast District Safety Metrics 11/01/2006
- Medical Monitoring 05/10/2006

Training and Certifications

Environmental Management Coursework, University of Maryland, 2003
Short Course Introduction to Geochemistry, National Groundwater Association, 1991
How to Manage Projects, Daniel Management Center, 1994
Drilling and Boring Fluids Workshop, Baroid Industrial Drilling Products, 1996
Site Remediation Course, Interactive Remote Instructional System (IRIS), Wright State University, 1996
Implementing the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) Approach for the Design and Conduct of Radiological Surveys, Oak Ridge Institute for Science and Education, 1999

Professional Memberships

Florida Association of Environmental Professionals
Society of American Military Engineers, Emerald Coast

Conference Presentations

DU Program at Eglin AFB, poster presentation, Battelle Range Sustainment Conference, January 2004, New Orleans, Louisiana.

Publications

Macbeth, A. and J. Hannah, "Magmatic History of the East Tintic Mountains, Utah," *U.S. Geological Survey* open file report 90-0095, 1990.

Employment History

1990 - present, Earth Tech
1987 - 1989, University of Vermont
1987 - 1988, US Geological Survey

Stuart I. Rixman, CHMM, CPEA, REA
Manager, EHS Services

Education

MBA, Business Administration, University of Delaware, 1972
BS, Chemical Engineering, Lehigh University, 1968

Professional Registrations

Certified Professional Environmental Auditor, #399821, 1999
Certified Hazardous Materials Manager, #1514, 1988
Registered Environmental Assessor, California, #REA-00117, 1987

Experience Summary

Mr. Rixman manages and conducts EHS compliance audits, EHS management system assessments, and environmental site/due diligence assessments; helps clients design, improve, and implement EHS management systems; develops compliance, waste reduction, and emergency response plans; prepares environmental reports and permit applications; and recommends cost-effective enhancements. For several years, he was a part-time ISO 14001 and OHSAS 18001 Lead Auditor for a Registrar. He has completed more than 500 EHS compliance audits and EMS assessments, and conducted and managed hundreds of site/due diligence assessments of a wide variety of facilities. A member of ASTM Committee E50 on Environmental Assessment since it was founded, he helped write Standard Practice E1527 for Phase I Environmental Site Assessments, and has provided expert testimony about it. Before becoming a consultant, he worked for 19 years for Fortune 200 chemical companies in plant, laboratory, and TSDF auditing, manufacturing management, engineering, and plant operations. His chemical plant experience includes specialty and agricultural chemicals, chlorine and caustic soda, and soda ash.

Project Experience

Environmental Site/Due Diligence Assessments

Confidential Client, Ten States. Managed environmental due diligence assessments of eight heavy industrial manufacturing plants and four other facilities. [2005]

Cascades, New York. Completed Phase I environmental site assessments of six hydroelectric power plants, an office building, and a boxboard manufacturing plant, and a limited-scope Phase II assessment, in support of proposed acquisitions. [2003]

Schenectady International, Michigan, Pennsylvania, and Tennessee. Completed environmental due diligence assessments of three chemical manufacturing plants in support of proposed acquisitions. [2003]

American Securities, United States, Australia, France, Germany, and United Kingdom. Managed and partially conducted third-party reviews of environmental site assessments and compliance evaluations of 13 manufacturing plants. [2003]

Beta Capital, Arizona, Arkansas, Georgia, Florida, Montana, Tennessee, Utah, Wisconsin. Managed environmental site assessment updates of eight motel properties. [2003]

Mitsubishi Investment Corporation, Due Diligence Assessment, West Virginia. Conducted an environmental due diligence assessment (Phase I ESA and limited-scope compliance evaluation) of a chemical company, and provided an opinion as to the general suitability of the facility for its intended purpose. Other employees completed a limited Phase II assessment. Based upon the results, advised the client of significant potential concerns regarding the facility.

GE Capital, Due Diligence Assessments, North Carolina, Oregon and Washington. Completed environmental due diligence assessments of a large bleached paper mill and associated landfill, an unbleached Kraft paper mill, a recycled corrugated cardboard processing facility, log-chipping operations, and a paper conversion and printing facility.

Wilsonart, Due Diligence Assessment, Quebec. Completed a Phase I environmental site assessment, limited-scope Phase II assessment, and compliance evaluation of a 500,000 square foot wallboard manufacturing facility located near Montreal that had been in operation for about 50 years.

Wright, Robinson, Ostimer & Tatum, ESA Expert Testimony, Virginia. Provided expert testimony in federal court regarding the meanings of various sections of ASTM Standard E1527 for Phase I Environmental Site Assessments, in conjunction with a lawsuit alleging failure by a consultant to detect a recognized environmental condition.

GE Capital, Third-Party Due Diligence Assessment Reviews, Multiple States. Completed third-party reviews of Phase I and II environmental site assessments and compliance evaluations of 25 scrap metal recycling facilities, 30 correctional facilities, 20 motor coach building and repair facilities, and four metal alloys manufacturing plants. Identified errors in, and omissions from, those reports, and estimated the costs to address many of the issues via corrective actions.

Motels of America, Phase I Environmental Site Assessments, 34 States. Under the direction of counsel to the client and to financial underwriters and a major bank, managed the completion of environmental site assessments and building inspections at more than 140 locations by coordinating the efforts of more than three dozen assessment personnel from two dozen offices.

ERGON, Due Diligence Assessments, Pennsylvania and West Virginia. For a potential purchaser, conducted Phase I environmental due diligence assessments of two crude oil collection terminals, a small oil refinery, and a lubricants blending, packaging, and distribution facility. Identified target areas for subsequent Phase II intrusive investigations that resulted in the identification of significant impacts to subsurface soil and ground water.

Fleet Bank, Third-Party Due Diligence Assessment Reviews, Four States and England. Reviewed due diligence assessments of six chemical plants in conjunction with a leveraged buyout of a division of a Fortune 100 corporation. The bank was concerned that the initial studies had not adequately addressed all relevant environmental concerns. All issues identified during the review were resolved in a manner satisfactory to the bank, and the transaction proceeded.

SC International Services, Site Assessments, Multiple States. Under the direction of the client's legal counsel, managed environmental due diligence assessments of 17 airline food preparation and distribution facilities serving major airports located in California, Hawaii, Nevada, New Jersey, New York, and Virginia, and 17 other food preparation and distribution facilities located in Connecticut, Georgia, Kentucky, Michigan, Minnesota, New Jersey, New York, and Ohio.

Maytag Corporation, Due Diligence Assessments, New Hampshire, Pennsylvania, Vermont, and Texas. Conducted environmental due diligence assessments of five appliances manufacturing facilities, and managed the assessments of two other facilities, in conjunction with proposed acquisitions.

Coopers & Lybrand, Due Diligence Assessments, Indiana, New Jersey, North Carolina, Pennsylvania. Evaluated the compliance status and environmental condition of seven current and former glass manufacturing plants. Identified existing and potential impacts to soil and groundwater, the status of permits, and air emissions and wastewater discharge compliance issues.

GE Supply Company, Phase I & II Site Assessments and Environmental Remediation, Connecticut. Completed Phase I and II assessments at a facility in which ammunition was manufactured from 1916 through 1937, and managed assessments for mercury, lead-based paint, and asbestos, and a cleanup of soil impacted by a historical release of PCBs.

OCI Chemical Company, Phase I & II Due Diligence Assessment and Ore Reserves Evaluation, Wyoming. Under the direction of legal counsel for a prospective purchaser, conducted a comprehensive environmental due diligence assessment and an ore reserves estimate and valuation of a mine and ore refinery in support of a proposed transaction valued at an estimated \$150 million. Also confirmed the availability of recoverable ore reserves, and defined the existing environmental conditions as well as the expected future situation regarding the disposal of tailings from the refinery.

Mitsubishi Investment Corporation, Due Diligence Assessments, Labrador and Quebec. Assessed environmental conditions of iron ore mines and ore concentrators, a 300+ kilometer railroad, and a port on the St. Lawrence Seaway. Identified an estimated \$10 million in potential future pollution control, compliance, and remediation costs. Subsequently, the client acquired an ownership interest for \$10 million less than the original asking price.

Chemical Bank, Due Diligence Assessments, California, Mexico, Spain, and France. Evaluated the environmental status of diatomaceous earth mines in conjunction with a buy-out transaction valued at more than \$70 million.

Chemical Bank, Due Diligence Assessment, Michigan. Evaluated the environmental status of a copper mine and smelter whose owner was seeking a \$10+ million loan. A new compliant smelter was estimated to cost \$150+ million.

First Boston Corporation, Due Diligence Assessments, Louisiana and Canada. Evaluated the environmental status of five salt mines in conjunction with a proposed acquisition valued at approximately \$125 million.

Pyramid Companies, Environmental Assessment and Remediation, New York. Managed soil and ground water investigations at a 55-acre former scrap yard that became the site of a \$200 million mall. Developed a site history; installed test pits, soil borings, and monitoring wells; obtained and interpreted soil and groundwater analyses and a soil gas survey; developed profiles of fill placed on the site many years earlier and groundwater isopleths; and drafted portions of an Environmental Impact Statement.

Compliance Evaluations

Confidential Client, Environmental Audits, Entire United States. Managed a program to complete environmental audits of more than 300 commercial and light industrial facilities located throughout the United States, and conducted about ten percent of them. Recommended actions to address the findings.
[2006]

Confidential Client, EHS Audits, Nationwide, United States. Managed a program to provide a client with experienced EHS auditors to assist the client in completing comprehensive environmental, health, safety, and DOT compliance audits of more than 50 large and medium-sized manufacturing facilities located throughout the United States. Have participated in audits of almost half of them, and served as audit team leader for several of them. Each audit lasted three to five days, covered all applicable EHS and DOT regulations, and involved a team of four or more experienced auditors. Provided recommended actions to guide the facilities in addressing the identified issues. [2005 - 2006]

Connecticut Department of Mental Health and Addiction Services, Environmental Audit, Middletown, Connecticut. Part of a team that conducted an environmental audit of a state-owned psychiatric hospital and its supporting operations, including a maximum-security facility, and made recommendations to address the identified concerns. [2006]

Confidential Client, Environmental Audits, Alabama and Louisiana. Conducted environmental audits of two railroad yards using a client-provided protocol, and made recommendations to address the issues that were identified. [2006]

New York State Office of General Services, New York. Audited a State-owned hospital and clinical research facility for environmental compliance and good environmental management practices. Areas of inquiry included air emissions permitting and monitoring; asbestos management; water supply and treatment; wastewater collection, discharge and permitting; storm water collection and permitting; hazardous waste status; management of biohazardous, hazardous, universal, and solid wastes; hazardous substances management, including PCBs, mercury-containing equipment, and lead-based paint; aboveground and underground storage tank permitting, monitoring and management; Oil SPCC Plan completeness and compliance; toxic substances release reporting; and pesticide use. Have also provided follow-up compliance assistance and audits. [2003-2006]

Dormitory Authority of New York / New York State Office of Mental Health, Environmental Audits, New York. Conducted environmental audits of five State-owned psychiatric hospitals and research facilities, and their supporting operations, including three maximum-security facilities. Defined the applicable requirements, evaluated each facility, recommended actions to address potential concerns, and as necessary educated facility personnel as to the meanings of the various requirements and effective means of assuring compliance. Also conducted limited compliance evaluations at several other State-owned psychiatric hospitals. [2002-2006]

Surpass Chemical Company, Environmental Compliance Assistance, New York. Helped this chemical formulator and distributor comply with an Order on Consent by conducting an environmental compliance audit and developing a recommended Best Management Practices plan. Emphasis was on compliance with the Chemical Bulk Storage Regulations. Also helped the facility have its tanks inspected and upgrade its Spill Prevention Report, and with ongoing EHS compliance needs. [1999-2006]

AVOX/Scott Aviation, Environmental Compliance Assistance, Lancaster, New York. Provided a compliance audit and form submission assistance related to applicable New York State and federal air emissions, hazardous waste management, and SARA Title III regulations at this manufacturing facility. [2002-2006]

Confidential Client, Environmental Compliance Reviews, Connecticut, Iowa, New Jersey, and New York. Conducted environmental compliance reviews of 33 facilities in Connecticut and the New York City metropolitan area ranging in size to more than 2.4 million square feet, to ascertain their status relative to applicable federal, state, and local environmental laws and regulations, and client environmental policies. Also conducted reviews of three facilities in Iowa. [2003-2006]

Maytag Corporation, Environmental Audits, Multiple States and Mexico. Trained a team of Maytag environmental compliance employees in environmental auditing techniques, then lead/guided that team in conducting compliance audits of appliance manufacturing plants and distribution facilities in California, Illinois, Iowa, Missouri, New Hampshire, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, and Juarez, Mexico. After the initial round of compliance audits, trained the team to audit the environmental management systems of facilities, as a means to sustained compliance. [1999-2005]

Confidential Client, TSDF Compliance Audits, Multiple States. Evaluated the compliance of the following hazardous waste facilities, and developed opinions regarding the risk to which the client might be exposed by virtue of sending its wastes to each: US Filter, Wilmington, Delaware; Lorco Petroleum Services, Elizabeth, New Jersey; and USA Lamp & Ballast Recycling, Milton, New York. [2005]

Confidential Client, Environmental Compliance Reviews, Nine States. Managed compliance reviews of nine manufacturing plants and associated facilities, and conducted one of those reviews. [2004]

Confidential Client, EHS Audits, New England and New York. Member of a two-person team that completed comprehensive EHS compliance audits of a 1,000-employee medical device R&D complex, a product distribution center, and a medical device manufacturing facility. [2003]

GE Supply Company, Comprehensive EHS Compliance Assistance, Entire United States and Puerto Rico. Wrote a concise EHS compliance manual focused on the client's business, created a model injury/illness prevention program, developed a compliance self-assessment program for use by 150+ locations, prepared SARA Title III Tier II reports for some locations, conducted more than 80 health and safety audits, and assisted with a broad range of environmental, health, and safety issues. [1988-2002]

Mercy College, Environmental Audit, New York. Evaluated the environmental compliance status of this college with respect to federal and state environmental laws and regulations, and made recommendations for altered practices. Topics included air, water, wastewater, solid and hazardous wastes, and hazardous materials. This audit was conducted in anticipation of a possible audit by USEPA Region II as part of its enforcement initiative that focuses on colleges and universities. [2000]

New York State Department of Correctional Services, Environmental Audits, New York. Completed environmental audits of a medium-security correctional facility and a maximum-security correctional facility, one of which contains a health care facility, for compliance with selected environmental regulations, including the "Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and Its Sources".

Confidential Client, Environmental Audits, Seven States. Conducted environmental and hazard communication audits of 65 utility company facilities over a five-year period. Major issues included fuel tanks, backup power supplies, solvent usage and disposal, SARA Title III reporting, PCB management, emergency preparedness, and written hazard communication programs.

Lower Colorado River Authority, Health and Safety Audit, Texas. Part of a team that conducted a comprehensive health and safety evaluation of this regional electric utility and made recommendations to reduce employee risk exposures.

Twin Rivers Textile, EHS and OSHA Audit, New York. Conducted environmental and OSHA audits of a facility that formulates water-based print pastes and does custom color printing on polyester for the garment manufacturing industry.

Confidential Client, EHS Audit, New York. Managed a comprehensive environmental, health, safety, and hazardous materials transportation (DOT) audit of this client's 1.25 million square foot corporate research and development facility, and conducted the environmental and DOT portions of the audit. Also directed the activities of a CIH/CSP who conducted the health and safety portions and completed an assessment of the facility's status relative to qualifying for acceptance into OSHA's Voluntary Protection Program. Performed a root-cause analysis of all identified concerns, and developed a recommended approach to address each concern.

Confidential Client, Environmental and Hazard Communication Audit, New York. Conducted an environmental and hazard communication assessment of a 250-megawatt cogeneration facility that has gas turbines, a heat recovery steam generator, and a steam turbine. Concerns included NOx and other air emissions, wastewater and storm water discharges, hazardous waste management, and hazardous materials storage and handling.

Stauffer Chemical Company, EHS Audits, Facilities in 18 States, Japan, and Australia. Evaluated more than 60 agricultural, specialty, and inorganic chemical manufacturing plants, and research laboratories and pilot plants for compliance with environmental, OSHA, and DOT regulations. Developed cost-effective recommendations to address the identified concerns. Also evaluated an underground Trona mine and the associated soda ash refinery, five chemical plants in Japan and Australia, and five commercial hazardous waste incinerators and landfills (TSDFs).

McNamee, Lochner, Titus & Williams, EHS Audits, Connecticut and New York. Evaluated the compliance of this law firm's client, a chemical manufacturer, with applicable environmental and OSHA regulations, and for the use of good management practices to reduce the risk of an uncontrolled release.

Confidential Client, TSDF Compliance Audits, Multiple States. Evaluated the compliance of the following hazardous waste facilities, and developed opinions regarding the risk to which the client might be exposed by virtue of sending its wastes to each: Rinco Chemical Industries, Benton, AR; Evergreen Environmental Services, Carson & Newark, California; Romic Environmental Technologies, East Palo Alto, California; Metalworking Lubricants, Indianapolis, Indiana; Heartland Cement, Independence, Kansas; CWM Chemical Services, Model City, New York; and Safety-Kleen in Reedley, California, East Chicago, Indiana, Dolton, Illinois, New Castle, Kentucky, Buffalo, New York, and Denton, Texas.

J. M. Huber Corporation, Environmental Audits, Colorado, Georgia, and Tennessee. Conducted comprehensive environmental compliance evaluations of two electronics assembly plants, a printing ink formulation and distribution facility, and a large chipboard manufacturing and distribution facility.

Confidential Client, TSDF Compliance Audits, California, Connecticut, and Nebraska. Lead teams of the client's employees in conducting evaluations of hazardous waste management facilities in Richmond, California, Bristol, Connecticut, and Kimball, Nebraska. Also developed a training program in the techniques of auditing commercial TSDR facilities and presented it to the client's personnel.

Inland Container, Waste Management Audits, Connecticut, Delaware, and Massachusetts. Evaluated boxboard plants that perform offset lithographic printing, and a recycled paper mill, for compliance with applicable solid and hazardous waste and hazardous materials management regulations.

The Noteworthy Company, Air Emissions and RCRA Audit, New York. Assessed the air emissions permitting and hazardous waste compliance status of a facility that makes blow-molded polyethylene film, custom-prints it using offset lithography, and then converts the printed film into plastic bags.

LeBoeuf, Lamb, Greene & MacRae, Environmental Audit, New York. Evaluated this law firm's client, an electronics plant, for compliance with applicable air emissions, wastewater discharge, hazardous waste, and PCB management regulations.

Chesebrough-Ponds Corporation, EHS Audits, Connecticut and Alabama. Evaluated three cosmetics manufacturing plants for compliance with applicable environmental, health, and safety regulations, and recommended corrective actions.

Stauffer Wacker Silicones, TSCA Audit, Michigan. Evaluated a silicone products facility that contains a research and development lab, pilot plant, and manufacturing plant, for compliance with TSCA rules on pre-manufacture notifications, test market exemptions, and notices of commencement of manufacturing.

Confidential Clients, TSDf Audits, Illinois and South Carolina. For Potentially Responsible Party (PRP) committees, audited the Peoria Disposal Company facility in Illinois and the Omni/Southeastern facility in South Carolina to determine their acceptability to receive and manage specific types of wastes from mandated environmental remediation activities.

Environmental Management Systems

Atlas Copco Comptec, EMS Implementation and Support, New York. Assisted this centrifugal compressor manufacturer with the process of developing and implementing an improved environmental management system (EMS). Also conducted EMS training for employees and internal assessor training for selected employees, developed a register of applicable legal and other requirements, assisted in the selection of a Registrar, and have periodically evaluated the facility's environmental compliance status. The facility was registered to ISO 14001 with no nonconformities identified during its registration audit. [2001-2006]

DaimlerChrysler, EMS Implementation, Michigan and Ohio. Over the course of three years, guided and assisted three automotive stamping plants (sequentially) in creating and implementing an EMS that conformed to the requirements of both the ISO 14001 standard and the corporation's own enhanced EMS requirements. This included integrating environmental conformance and improvement into daily operations at all levels, and merging the EMS with the existing ISO 9001 quality management system. Then assisted two parts distribution centers in creating and implementing EMSs so that they also could achieve ISO 14001 registration. Major program components included helping each facility to identify its environmental aspects and impacts, define applicable environmental requirements and means of assuring that they are consistently met, set objectives and targets for environmental improvements, create or enhance existing procedures and forms, and define and conduct training. Toward the end of the process at each location, conducted an assessment to confirm that the facility's EMS was suitable, adequate, and effective. All five facilities were registered to ISO 14001. Separately, conducted pre-assessments at eight other plants to determine their readiness for ISO 14001 registration audits. The EMS project at the first stamping plant was the U.S. pilot of DaimlerChrysler's EMS program. Lessons learned and tools developed during it made EMS implementation more efficient and cost-effective during the subsequent EMS implementation at all DaimlerChrysler locations in the Western Hemisphere. [1999-2005]

NSF-ISR, ISO 14001 and OHSAS 18001 Registration and Surveillance Audits, Multiple States. The client, NSF International Strategic Registrations, Inc. (NSF-ISR) is an RAB-accredited ISO 14001 (and ISO 9000) Registrar. On a contract/as-needed basis, conducted a total of 46 ISO 14001 Registration, Surveillance, and Re-Registration audits over a period of seven years. Also conducted 5 OHSAS 18001 Registration and Surveillance audits over a period of 1.5 years. The facilities audited covered a broad range of industries and activities, including manufacturing plants for metal products, chemicals, pharmaceuticals, plastic packaging, and automobile components; a brewery; non-metal mining and ore refining facilities; a chemical products corporate headquarters and R & D center; a large pharmaceutical products R & D center; and four construction companies. Served as the Lead Auditor for a majority of the audits. Responsibilities included planning and scheduling the audits and preparing reports and recommendations, in addition to the on-site activities. [1998-2005]

Dataram Corporation, Pennsylvania. Assisted this small assembler of electronic components in developing and implementing an EMS so that it could become registered to ISO 14001. [2004-2005]

Lafarge Corporation, EMS Assistance, New York. Assisted a large cement manufacturing plant and quarry with designing and implementing an enhanced environmental management system that meets the requirements of the EPA's National Environmental Achievement Track and the requirements of ISO 14001. Lead the processes of creating an EMS Manual and associated EMS procedures and forms, identifying and ranking hundreds of environmental aspect/impact pairs, and creating general EMS awareness training tools. Then created a Visio drawing for each major process that shows environmental as well as process inputs, flows and outputs, and identifies associated environmental Standard Operating Procedures. [2001-2003]

Confidential Client, EMS Implementation, New York. Assisted a manufacturer of explosives with the process of strengthening its EMS, and assuring that it conforms to the requirements of ISO 14001 and the EPA's National Environmental Achievement Track. [2001-2003]

General Motors, EMS Guidance and Training, Ohio and Wisconsin. Provided guidance and assistance to an automotive components manufacturing plant during its ISO 14001 registration audit. Also conducted training for internal EMS auditors at another plant, and assisted it in enhancing its procedures to conform to the requirements of ISO 14001. [2001]

Confidential Client, EMS Enhancement, Virginia. Assisted a semiconductor fabrication facility in the implementation of an improved environmental management system that conformed to the requirements of ISO 14001. The facility subsequently passed its registration audit with no nonconformances. Also conducted an assessment of part of the facility's EMS in preparation for its initial surveillance audit, and trained internal auditors. [1999 - 2000]

WMX Technologies/Bio-Gro Division, EMS Gap Analysis, Maryland. Conducted a baseline assessment of the environmental management system of this operation, which involves applying sludge from 35 municipal wastewater treatment plants to more than 1,000 farm fields, for conformance to the requirements of the GEMI and ISO 14001 standards.

WMX Technologies, EMS Gap Analysis, Oregon. Evaluated the environmental management system of a RCRA-permitted hazardous waste treatment and storage facility and Subtitle C landfill for conformance to the requirements of the ISO 14001 standard.

Confidential Clients, EMS Baseline Assessments, Indiana and Texas. Completed baseline assessments of the environmental management systems of a non-ferrous metal parts manufacturing plant and a pharmaceuticals manufacturing plant for conformance to the requirements of ISO 14001. The pharmaceuticals plant then addressed the identified gaps promptly, so that it was able to pass a registration audit the following month.

Compliance Assistance and Risk Reduction

Confidential Client, New York. Assisted a manufacturing facility in complying with the New Source Performance Standards under the Clean Air Act. Also prepared an oil SPCC Plan. [2006]

US Postal Service, New York City Community Right-to-Know Reporting, New York. Managed a project to conduct onsite chemical inventories and prepare forms related to the New York City Department of Environmental Protection Community Right-to-Know Law for 32 facilities. [2005]

ARTCO Chemical, Chemical Bulk Storage Assistance, New York. Evaluated the environmental compliance status of this chemical distributor and assisted it in complying with New York's Chemical Bulk Storage regulations. [2002]

American National Can Company, SARA Title III Reporting, Multiple States. Directed the preparation of more than 300 SARA Title III Form R reports for approximately 50 plants throughout the United States, and provided quality assurance for the completed reports.

IBM Federal Systems, SARA Title III Reporting, New York. Prepared a hazardous waste reduction plan (HWRP) for this large aerospace electronics manufacturing facility, prepared the first annual update to the HWRP, and prepared its SARA Title III Tier II and Form R reports for two years.

Confidential Client, Hazard Risk Assessment, New York. Evaluated the design and layout of a proposed large cogeneration unit and used dispersion modeling to predict potential impacts to off-site receptors from worst-case vapor release events. As a result, certain aspects of the process and layout were redesigned, and additional safeguards were incorporated.

New York State Office of General Services, Environmental Compliance, New York. Evaluated the state prisons located within the New York City watershed for compliance with the City's watershed protection regulations, and identified needed changes and facility upgrades. Prepared a guidance manual to assist them in evaluating the environmental requirements that could become applicable if changes to a facility are planned.

Confidential Client, PCB and SARA Title III Reporting, New York. Directed the preparation of PCB annual document logs for three years for a facility with hundreds of PCB-containing transformers and capacitors. The project team gathered all relevant information, entered it into a database, and then created spreadsheets that were cross-linked to the database so the Logs could be produced accurately and in a cost-effective manner. Also directed the preparation of SARA Title III Form R reports for one year.

NGK Metals, PCB Compliance Audit and Assistance, Pennsylvania. Evaluated the compliance of a beryllium copper plant with the TSCA PCB regulations, compiled an inventory of its PCB-containing transformers and capacitors, and prepared a comprehensive PCB compliance manual targeted to the rules applicable to the plant.

Rohm & Haas, RCRA Compliance Assistance, Pennsylvania. Created detailed, comprehensive Hazardous Waste Procedures Manuals for two chemical manufacturing operations.

Environmental Permitting

Multiple Clients, Air Emissions Permitting, New York. Prepared air permit applications for 50+ sources of emissions from operations such as power houses flexographic printing; paint spraying and curing; textile printing and processing; stone crushing, screening, storage, and shipping; cement storage and handling; concrete batch mixing; and metal parts cleaning. Assisted some facilities in "capping out" as synthetic minor emission sources under Title V. [1995 - 2004]

Confidential Client, Title V Permitting, New York. Managed the preparation of an air emissions inventory and then a Title V permit application for a large R&D facility. Also helped define and implement Reasonably Available Control Technology (RACT) for affected sources of emissions of NOx and VOCs, and evaluated the facility's status relative to compliance with the applicable regulations promulgated by the EPA and the state. [1997 - 2002]

Training

ISO 14001 Environmental Management Systems Lead Auditor, 1997
OSHA 10-hour Construction Safety Training
OSHA 40-hour Hazardous Waste Operations Training, 1987
OSHA 8-hour Hazardous Waste Operations Annual Refresher Training
OSHA 8-hour Hazardous Waste Operations Site Supervisor Training, 1990

Professional Memberships

The Auditing Roundtable
ASTM Committee E50 on Environmental Assessment (founding/voting member)
Academy of Certified Hazardous Materials Managers
American Institute of Chemical Engineers

Conference Presentations

"All Appropriate Inquiries – What's New and different?," The Auditing Roundtable, Phoenix, Arizona, 2006.

"How an Environmental Management System (EMS) Can Improve Compliance (and Reduce Your Costs)," Risk Management Workshop, New York Construction Materials Association, 2004.

"Audits of Healthcare Facilities - Why, What & How," The Hospital Association of New York State, Albany, New York, 2003.

"Complying With Hazardous Waste Regulations," 1999 Annual Industry-Environment Conference, The Business Council of New York State, Albany, New York, 1999.

"ISO 14001," Sheboygan County Chamber of Commerce, Sheboygan, Wisconsin, 1997.

"Environmental Audits and Confidentiality: An Overview," 1995 Legislative Forum hosted by the Environmental Law Section of the New York State Bar Association, Albany, New York, 1995.

"Balancing Audit Programs and Liability Exposures," 1993 Penn Expo, Hershey, Pennsylvania, 1993.

Employment History

1987 - present, Earth Tech

1974 - 1987, Stauffer Chemical Company

1968 - 1974, Diamond Shamrock Corporation