

Barbara A. Trenary, C.I.H.

Associate of Integral



Education and Credentials

B.S., Industrial Hygiene/Chemistry (with honors), Colorado State University, 1979

Continuing Education and Training

Certificate: Management, Business Skills for Software Professionals, University of Washington, 1999

Certificate: Finance for Non-Financial Managers, University of Washington, 1999

Professional Affiliations

American Industrial Hygiene Association

American Board of Industrial Hygiene

Indoor Air Quality Association

Professional Profile

Ms. Barbara Trenary is a certified industrial hygienist with 37 years of experience in the fields of comprehensive industrial hygiene, hazardous materials, indoor air quality, ambient and indoor air monitoring, environmental and structural remediation, training, and program development and evaluation. She has created and managed health and safety policies and procedures at four Fortune 400 companies and at numerous project sites.

Ms. Trenary's technical experience includes comprehensive industrial hygiene assessments of individual and community exposure, microbial growth, asbestos, volatile organic compounds (VOCs), fire odors and residues, accidental releases, methamphetamine contamination, sewer backups, tear gas residues, heavy metals, contamination of shipments, and tobacco smoke residues.

Relevant Experience

Ambient and Indoor Air Quality Assessments, Nationwide—Performed more than 2,100 indoor air quality and contamination assessments for commercial, industrial, multi-family, developer, and residential parties. Worked with building envelope engineers and architects to investigate cause and origin of building contamination, and design and implement sampling and verification strategies. Prepared remediation protocol for mold, fire residues, asbestos contamination, and other contaminants.

Subject Matter Expert, Ross In Situ Recovery Project, Crook County, Wyoming—Served as subject matter expert for air quality, noise, and public and occupational health in authorship of the environmental impact statement for the Ross *In Situ* Recovery Project for *in situ* uranium recovery. Work completed for the Nuclear Regulatory Commission in 2014.

Subject Matter Expert, Fungal Growth, Atlanta, Georgia—Served as subject matter expert for fungal growth in authorship of "Reducing Mold and Dampness in Buildings" for U.S. Centers for Disease Control and Prevention in 2015.

Reclaim Carbon Black Plant Health and Safety Support, Boardman, Oregon—Reviewed plant operations for health and safety best



management practices. Collected three annual carbon black sampling rounds for compliance with the consent order. Authored three safety data sheets for company products.

Reclaim Consent Order Challenge, Boardman, Oregon— Authored successful challenge to TSCA animal testing requirements in a 2013 consent order for a Significant New Use Rule product.

Expert Witness, Nationwide— Provided litigation support and acted as consulting and/or testifying expert for more than 60 lawsuits or legal disputes involving construction defects, “toxic torts” (e.g., mold, heavy metals, VOCs, asbestos, lead, carbon monoxide, fibrous glass, pesticides, particles), or water/sewerage intrusion that resulted in property damage or alleged health effects.

Universal Avionics, Fungal Resistance Reviews, Duluth, Georgia— Evaluated aeronautical equipment for fungus resistance per RCTA/DO-160G and FAR requirements.

Exposure Assessment Strategies, Dade Moeller, Richland, Washington— Coordinated multiple stakeholder inputs and authored the comprehensive exposure assessment strategy for tank farm vapor exposures at Hanford Nuclear Reservation.

Health and Safety Program Development, Morrison Knudson (now URS), Hewlett Packard, Fluor Daniel and Dow Environmental, Boise, Idaho— Established company-wide health and safety programs, policies, and procedures at four Fortune 400 companies in disparate fields. Trained middle managers and site health and safety personnel in implementation. Audited programs for relevance, currency, and compliance.

Hazardous Waste Operations and Emergency Response (HAZWOPER) Instruction, Morrison Knudson (now URS), FMC, Fluor Daniel, Dow and companies too numerous to mention, Boise, Idaho— Created course materials, reference library, personal protective equipment (PPE) bank and hands-on exercises in response to 24- and 40-hour HAZWOPER requirements. Taught more than 1,000 students in HAZWOPER and annual refreshers.

Health and Safety Plans (HASPs), Nationwide— Authored numerous project HASPs, ranging from clean construction to remediation of contaminated soil and groundwater.

Analysis of Health and Safety Issues, CH2MHill Group, Richland, Washington— Performed analysis of recommended corrective actions relative to health and safety at the Hanford Tank Farm regarding waste remediation.

Industrial Hygiene Evaluations, Eldec Corporation, Martha Lake and Bothell, Washington— Performed wall-to-wall industrial hygiene and safety survey of multisite manufacturing and plating facilities. Conducted training for hazardous materials response and specifically for liquid nitrogen. Performed industrial hygiene sampling for regulatory compliance.

Radioactive Waste Remediation, Denver Radium (Shattuck Chemical), Denver, Colorado— Served as project manager and health and safety manager for the Denver Radium remedial construction site. Took over management and execution of a \$5 million lump sum radioactive waste soil



solidification/stabilization of project at a mid-city Superfund site. Managed dust control within tight allowances, ensured regulatory compliance, performed air monitoring, and taught construction safety.

Testing of Detection Equipment, BioResearch Corporation, Vancouver, British Columbia—Served as project manager for comparative testing of field detection instruments for biological agents. Evaluated immunoassay technology using viable spore suspension of anthrax vaccine to assess sensitivity and reproducibility.

Training, More Than 20 Continuing Legal Education Courses and Other Speaking Engagement Venues—Taught mold (and bacteria) investigation and remediation techniques to attorneys, workers, and consultants.

Anthrax Assessment, Naval Subbase Bangor, Poulsbo, Washington—Served as principal investigator for investigation of potential anthrax contamination at mail rooms within the U.S. Department of Defense. Performed surface, air, and vacuum sampling within a strategy that reflected concerns of the workforce, mail flow, HVAC system design, and common touch areas.

Methods Development, Intertox, Inc., Seattle, Washington—Primary author of “Assessing Vulnerable Facilities for the Presence of *Bacillus anthracis* (anthrax), Air and Surface Sampling Guidance” for proactive sampling, approved by the University of Minneapolis, School of Public Health.

Demolition of Radioactively Contaminated Structure, Brookhaven National Laboratory, Islip, New York—Project oversight for decontamination and demolition of 1.8-million-pound internally contaminated ventilation ducts at a Brookhaven National Laboratory research reactor. Assigned to turn around project from significant loss to a profitable position. Course-adjusted work approach under numerous changed conditions and managed recovery through mediation.

Risk Assessment, Shell Oil Company, Denver, Colorado—Performed alternate human health risk assessment under several exposure scenarios at the Rocky Mountain Arsenal, Commerce City, Colorado. Various chemical agents (sarin, VX, mustard), solvents, metals, and pesticides were evaluated. Coauthored paper accepted for publication in the *Journal of Risk Analysis*.

Acquisition Due Diligence, Fluor Daniel, Irvine, California—Performed extensive health and safety systems audit for due diligence of a \$60 million acquisition of Groundwater Technologies, Inc., an environmental services firm. Evaluated programs and procedures, accident experience, medical monitoring, exposure records, ergonomic programs, training compliance, etc., and prescribed corrective actions.

Ergonomics Evaluation, BF Goodrich, Everett, Washington—Consultant for development of an ergonomics tool for a large aircraft maintenance facility for Boeing aircraft. Worked with a team of 10 employees from different production lines to design, field test, and finalize this tool, which was then made available to the State of Washington.



Asbestos Management, Morrison Knudson (now URS), Western U.S.— Taught Asbestos Building Inspector and Management Planner classes for the Rocky Mountain ERC, Salt Lake City. Built and managed Morrison Knudson’s asbestos group, consisting of up to 30 people. Managed statewide inspection and maintenance contracts in California and Idaho. Managed more than 60 design and abatement projects. No OSHA violations. Testified in contest of regulatory citations.

Asbestos and Industrial Hygiene Laboratory Management, Prezant, Seattle, Washington— Provided management oversight and successfully retained certifications for a laboratory accredited by the American Industrial Hygiene Association and the National Voluntary Laboratory Accreditation Program. Participated in customer and association quality assurance audits.

Remediation Health and Safety, More Than 90 Projects Nationwide— Provided health and safety support for 20 years for hazardous waste remediation projects encompassing remedial investigations and feasibility studies, removal actions, facility demolition and destruction, underground tank removal, bioremediation, groundwater contamination, equipment decontamination, and clearing and grubbing. Contaminants included lead and other heavy metals, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), pesticides, asbestos waste, poison gases, organic solvents, explosives, and chemical and biological agents.

Groundwater Remediation, Lockheed Martin, Burbank, California— Health and safety manager for the construction and operation of a 9,000-gpm groundwater treatment plant, and the 2-mile, seven-wellhead underground pipeline installed to supply groundwater to the plant. Investigated cause of carbon bed fire (6 months into operations) and oversaw confined space entry requirements for its repair.

RCRA and WISHA Regulatory Compliance, Purdy Metals, Seattle, Washington— Project manager for metals recycling facility, including representation in potentially responsible party determination and negotiation for the Tulalip Landfill Superfund site, industrial hygiene monitoring, lead and arsenic program creation, and training.

Soil Remediation, U.S. Army Corps of Engineers, White Sands, New Mexico— Health and safety manager for installation and operation of a soil vapor extraction system for the U.S. Department of Defense. Activities included installation of soil borings to serve as extraction wells, and characterization of volatile organics in the soil. Heat stress and administrative controls were special challenges during this project.

Pesticides Cleanup, Dow Elanco, Davis, California— Health and safety manager for a specialty drilling project requiring a 100-ton rig with a 97-inch mast to install thirty-eight 7-foot-diameter caissons for soil vapor extraction system.

Shipyard Health and Safety, National Steel and Shipbuilding Company, San Diego, California— Health and safety consultant for a subsidiary steel and shipbuilding company for 3 years. Issues included confined space entry, asbestos, PCBs, bilge contaminants, solvent exposures, training, and accident investigation.



Human Health Risk Assessment, Dow Chemical, Freeport, Texas—Risk assessor for human health risk assessment at a site with buried drums and percent organic soil contamination. Modeled soil, groundwater, surface water, and sediment contamination. Activities included research of toxicity values, exposure assessment for multipathway analysis of industrial and residential receptors, risk characterization, and uncertainty analysis.

Demolition of Pesticide Storage Facility, Dow Elanco, Pasco, Washington—Project manager for decommissioning of four 5,000–7,000 barrel tanks storing 1,2-dichloropropene and chloropicrin. The presence of these highly toxic and volatile substances required Level A and B PPE, confined space entry procedures, and an absorption system to treat vapors from tank cleanout and transport tanker filling. Wastes were manifested and shipped interstate for incineration.

Soil Remediation, Boeing Company, Fredrickson, Washington—Project manager for bioremediation of 7,200 cubic yards of petroleum hydrocarbon contaminated soil. Approach consisted of stockpiling soil on asphalt pad, trenching to mix fertilizer, and installing two layers of piping.

Remediation Contract, Washington State Department of Ecology—Project manager for State Federal Facilities Unit. This 2-year contract consisted of a series of projects for which work was performed for a regulatory agency. The projects operated under interagency agreements (EPA Region 10, Washington State Department of Ecology, and the individual military installation). Example: an aluminum recycling site where surface water, sediment, soil and surficial heavy metal and PCB contamination was characterized and interim remedial measures were taken to prevent offsite migration of contaminants.

RCRA Evaluation and Corrective Actions, Liquid Air Products, Tacoma, Washington—Project manager for gas manufacturer. Project work included various RCRA compliance issues, water discharge quality to publicly owned treatment works and storm sewers, feasibility analysis for handling waste streams designated as “Dangerous Wastes” in Washington, PCB evaluation and cleanup of concrete surface and PVC drain contamination, and soil remediation. Extensive negotiation of cleanup levels.

Soil and Groundwater Remediation, Umatilla Army Depot, Umatilla, Oregon—Health and safety manager for U.S. Department of Defense project. Authored HASP and provided onsite support for investigation of soil and groundwater contamination at the explosives washout lagoons. Contaminants included TNT, DNT, HMX, RDX, and octogen. Project issues included explosive safety, safety and noise associated with percussion dual-wall reverse circulation drilling, air monitoring, and training.

Pesticides Remediation, Burlington Northern Railroad, Yakima, Washington—Project manager for RCRA audit and corrective measures. Initial RCRA audit of pesticides formulation facility included soil, groundwater, site operations, and waste handling. Prepared work plan for corrective actions, including removal and decontamination of an underground vault storing bulk DDT.



RCRA Site Assessment, Dow Chemical, Wilmington, New Jersey—Served as health and safety manager. Authorized HASP and provided onsite support for site investigations at 12 solid waste management units at a primary explosives manufacturing plant. Contaminants included lead azide, mercury fulminate, and lead styphnate. The HASP outlined PPE and investigation techniques that would minimize potential for exposure or explosion.

Site Investigation, Burlington Northern Railroad, Spokane, Washington—Health and safety manager for a former train switching yard. Performed characterization for PCB contamination, widely dispersed asbestos-containing materials, surficial and subsurface diesel spills, buried tank cars used as underground storage tanks, and debris. Remedial activities included site security, excavation of contaminants, removal and treatment of contaminated standing water, tank removal, and grading.

Pesticides Site Investigation Remediation, Yakima, Washington—Health and safety manager for characterization and decontamination of a pesticides formulation facility, including soils, impoundments, and groundwater. Extensive contamination including many banned chlorinated pesticides, including DDT at up to 70,000 ppm.

Soil Remediation, Burlington Northern Railroad, Salt Lake City, Utah—Health and safety manager for large release at a large aboveground storage tank farm. Activities included characterization, and design and installation of a trench system to collect fuel oil. Soils at the site included imported uranium mill tailings fill; low levels of radioactivity were detected at numerous investigatory borings around the 200-acre site. The rail yard remained in full operation during the remediation.

Demolition of Beryllium Oxide Contaminated Structure, Coors Porcelain, Evergreen, Colorado—Health and safety manager for complete pervasive beryllium oxide decontamination and demolition of a porcelain manufacturing facility in which beryllium was used. An elementary school was adjacent to the property.

