THE EXPERTS
Robson Forensic

MICHAEL D. KLEIN, PE, CHMM, CFEI
Engineering and Project Management
Hazardous Materials and Water Resources Expert

Michael is a Professional Engineer, a Certified Hazardous Material Manager and a Certified Fire and Explosion Investigator with 25 years of experience in the design, planning, and delivery of high-value projects for the government and private sectors. His experience includes the operation and supervision of waste treatment systems for vapor, water, waste water, and industrial high hazard waste streams. He has conducted environmental investigations and hazardous waste remediation per the Environmental Protection Agency (EPA) Superfund requirements. His experience managing hazardous materials includes Department of Energy (DOE), EPA, Occupational Safety and Health Administration (OSHA), and Department of Transportation (DOT) requirements.

Michael's project management experience includes technical studies, system design, capital construction, and software development in industrial manufacturing and DOE nuclear facilities. He has particular expertise in the treatment and distribution of water to meet the requirements of the Safe Drinking Water Act (SDWA), laboratory analytical testing services, and data validation. His extensive chemical hazardous waste consulting includes hazardous waste source reduction, hazardous waste treatment, radioactive waste treatment, waste recovery, work place safety, facility decontamination, decommissioning and demolition, wastewater recycling, operator training programs, and troubleshooting water, waste water and industrial waste treatment plants.

Areas of expertise include:

- remedial investigations
- feasibility studies
- engineering design
- remedial actions
- environmental compliance
- construction economics
- water, wastewater treatment facility operations
- management of change
- facility waste management programs
- laboratory quality assurance and data validation
- technical project management
- strategic planning for decommissioning and demolition of contaminated facilities
- industrial facility operations and maintenance
- project cost and schedule management
- explosion and fire investigations

Manufacturing Processes: General machining, metal forming, foundry operations, welding, tungsten inert gas (TIG) welding, metal inert gas (MIG) welding, brazing, grinding, soldering, oxyacetylene cutting, hot isostatic pressing, aligning, shrink fitting, slitting, blending, drying, dry solids handling, slurry handling, liquid handling, paint preparation, painting.

Material Handling Processes: Forklift trucks, fork lift handlers including pallet, container and drum handlers, pallet jacks, hand trucks, carts and lifting devices.

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Manufacturing Procedures, Standards and Specifications: Pressure vessels, power piping, pipe welding, structural welding, international steel specifications, sanitary manufacturing, pharmaceutical manufacturing, drawing standards, Material Requirements Planning (MRP) and hazardous area requirements.

Testing Methods, Data Evaluation, and Specifications: Hydrostatic testing, static and high speed dynamic balancing, acceptance sampling, data quality assessment, analytical laboratory quality assurance/control, material testing, mechanical and digital measurement inspection systems, and thermal mapping.

Engineered Systems: Steam, condensate, feed water, liquid fuel systems, natural gas, chemical feed systems, process water, waste water treatment, potable water production, deionized and ultra pure water production, automated liquids bottling, ammonia and freon refrigeration systems fire protection, hydraulic power, pneumatic power, pneumatic control, heating, ventilation and air conditioning, clean room, vacuum, subsurface depressurization systems, inert gas systems, liquid fuel systems, Underground Storage Tanks (USTs), fuel delivery systems, dispensers, Automatic Tank Gauge (ATG) systems, fuel inventory, vapor recovery, shear valves, poppet valves, leak detection systems ,natural gas, Heating, Ventilation and Air Conditioning (HVAC) and High Efficiency Particulate Air (HEPA) filtration systems.

Machinery: Diesel engines, high-speed centrifuges, cable winches, pumps, drive gears, clutches, compressors, distillers, heat exchangers, chillers, cooling towers, air handlers, valves, boilers, turbines, jib cranes, monorail cranes and hoists, overhead bridge cranes, milling machines, lathes, presses, segmented gamma scanners, high-energy particle calorimeters, screw conveyors, belt conveyors, roller conveyors, chain conveyors, spreader beams, lifting and rigging gear, material shedders, and hammer mill grinders.

Machinery Safeguarding: Identification of hazardous actions and motions of machinery, safety interlocks, drive guards, operational guards, pinch point guards, failsafe modes, caution and warning signs, operating and instruction manuals.

Safety: Environmental Management Systems, material safety data sheets, right-to-know, permit required confined space entry, hot work, electrical hazards and energy control (lockout/tagout), training requirements, policies and procedures, inspections, OSHA requirements, nuclear materials management, radiological protection, hazardous material handling/labeling/use/storage/disposal; packaging and shipment of biological(s) utilizing cryogenic dry shipper, proper selection, use, training and maintenance of personal protective equipment. (e.g., head, eye, hearing, respirators, hands and feet, etc.), Management of Change (MOC); What-If; Checklist; Hazard and Operability Study (HAZOP); Failure Mode and Effects Analysis (FMEA); and Fault Tree Analysis; Activity Hazard Analysis (AHA); Job Safety Analysis (JSA); and Job Hazard Analysis (JHA).

Tools: Reciprocating electric hammers, rotary electric drills, and material mixers.

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Facilities and Plant Engineering: Facility systems design, installation, startup, maintenance, calibration and return to service of industrial systems, included but not limited to electrical, mechanical, plumbing, compressed air, Heating, Ventilation and Air Conditioning, humidification, domestic hot water, ammonia and freon refrigeration, roofing, walls & floors, doors & windows, overhead doors, lighting, energy management, warehousing, dock systems, hoists & cranes, conveyor systems, maintenance management, environmental management of solid and hazardous waste streams, Asbestos Containing Material (ACM), building/facility inspection and management, recycling equipment, fire protection, code and regulatory requirements.

Regulatory Compliance: Clean Water Act permitting, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), Resource Conservation and Recovery Act (RCRA) Permitting, RCRA closure, land recycling programs, air quality permitting, packaging and labeling requirements for transport of biological substances and hazardous materials per 49 CFR – Transportation, Parts 100 to 185.

Environmental Engineering: hazardous waste source reduction, hazardous waste treatment, waste recovery, waste minimization, and wastewater recycling. Determination of nature, extent and cause of contamination from smoke, fire and chemical releases, remediation methods for contaminants.

Water Resources: wastewater pretreatment, wastewater treatment facility design, wastewater treatment equipment, wastewater collection equipment, waste auditing, effluent monitoring, water statue, wastewater statue, drinking water treatment, drinking water disinfection, drinking water treatment equipment, water storage and distribution.

Management Systems and Standards: Quality and material control systems, resource loaded PRIMAVERA P5, P6 and Microsoft Project schedule development, ANSI/EIA-748 earned value management systems, cost and schedule performance evaluation utilizing Program Evaluation and Review Technique (PERT), Critical Path Method (CPM) and productivity delay claims analysis using the Measured Mile methodology.

PROFESSIONAL EXPERIENCE

2009 to present **Robson Forensic, Inc.**
Associate
Provide technical investigations, analysis, reports and testimony toward the resolution of commercial and personal injury litigation involving facility systems, building and grounds, plant engineering, work place safety, and maintenance. Further expertise includes root cause analysis, failure analysis, hazardous materials management, fire and explosion, calibration of and performance of building systems, environmental compliance, waste treatment, safe drinking water data evaluation, laboratory analysis methods, and safety issues related thereto.

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2005 to 2010 **Time Solutions**
Cost and Schedule Analyst
Technical consultant performing project management, cost and risk estimating, analysis, and project control activities. Team member for design and selection of a high hazard machining center and foundry used in the manufacture of nuclear weapon system components. Performed construction management and the start-up of the Chemistry and Metallurgy Research Replacement (CMRR) utility, laboratory and office buildings at the Los Alamos National Laboratory (LANL).

Portfolio management of project schedules and budgets, identifying issues that impact project completion and budgets. Interfaced between the construction contractor, owner, and site construction manager with schedule-related services which include:

- Contract scheduling specification reparation
- Baseline schedule review and contract compliance evaluation
- Earned Value Management (EVM) to support of full American National Standards Institute (ANSI) 748 compliance for government agencies and contractors
- Contemporaneous delay analysis and quantification
- Recovery schedule evaluation
- Schedule analysis and quantification of actual and liquidated damages related to delays, disruptions, and project acceleration

2004 to 2005 **X West Group**
Project Manager
Technical consultant for the preparation of Unreviewed Safety Question Determinations (USQD), evaluated if the proposed change increased the probability and consequence of an accident previously evaluated in the facility's existing safety analysis. Performed evaluations of proposed changes increasing the probability and consequence of a malfunction of equipment important to safety previously described in the facility's existing safety analysis. Performed evaluations of proposed changes in creating the probability of an accident of a different type than any previously evaluated in the facility's existing safety analysis. Performed evaluations of proposed changes creating the probability of a malfunction of equipment important to safety of a different type than any previously evaluated in the facility's existing safety analysis. Evaluated the proposed change and impacts to the reduction of the margin of safety.

Performed annual updates to the Department of Energy (DOE) Pantex Regional Office in accordance with the Implementation Guide for Use In Addressing Unreviewed Safety Question Requirements, DOE G 424.1-1 and the Pantex Plant Unreviewed Safety Questions Program (U), STD 3014 for Facility and Nuclear Weapon Programs. Perform maintenance of the LINAC/CT/X-RAY and Mass Properties Safety Analysis Report modules based on emerging operational requirements.

2002 to 2003 **Services First Inc.**
Project Manager
Technical consultant for the development of a Self Assessment Program (SAP) implementing procedure per the DOE Order 414.1A, Quality Assurance and DOE G 414.1-1A, Management Assessment and Independent Assessment Guide in support of operations at the Nevada Test Site (NTS). The self-assessment process established a methodology for employees and organizational units to evaluate their performance in meeting NTS program and projects objectives. These included, but were not limited to, effective implementation of Environmental, Safety, and Health (ES&H) requirements and other programmatic requirements.

2002 to 2003 **ARES Corporation**
Project Manager
Project Manager for the preparation of nuclear safety basis (SB) documents in accordance with DOE-STD-3009-94, and Los Alamos National Laboratory (LANL) LIR-300-00-06 and for activities associated with the performance of a large-scale, contained dynamic experiment in support of LANL Nuclear Weapons Stockpile Stewardship and Certification Mission. Performed "what if" Hazards Analysis (HA) and Hazards Control Plans (HCPs) identifying the possible accident scenarios that may occur and separating individual work elements into a sequence of steps, identifying the potential hazards, the initial risk (both consequence and probability); and failures of each step. Determined the controls and barriers required to overcome these hazards in an operational environment. Developed technical operating procedures and policies to ensure that modifications to the configuration of facilities, equipment, changes to operating procedures, and practices were documented and controlled.

Developed an operating procedure (OP) to establish a uniform method for the control of documents and the retention/maintenance of records relevant to engineering design, construction, safety, health and environmental management per ISO 9001, Quality Management Systems. Tasks included the development of processes that regularly review, revise as necessary, and obtain approval for use by authorized personnel, prior to use. Ensure that versions of relevant documents were available at all locations where operations essential to the effective functioning of the systems were performed. Developed process to promptly remove, from all points of issue and points of use, the obsolete documents. Developed methodology for the performance of internal audits, control of nonconforming product, corrective and preventive actions.

2001 to 2002 **Qwest Communications**
Project Manager
Project Manager for the Interconnect Mediated Access (IMA) Electronic Data Interchange (EDI) systems that provide the Competitive Local Exchange Carriers (CLECs) ability to access Qwest Communications systems through a web browser, EDI, or by fax to the Interconnect Imaging Systems (IIS). Provided project management of EDI system software definition, development, and deployment for the Interactive Agent (IA), EDI Hub, and the GE Global eXchange Services (GXS) Application Integrator (AI) software product in a UNIX environment.

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2000 to 2001 **GE Access**
Project Manager
Project Manager responsible for the development and implementation of an EDI program that is both EDI and XML capable in a UNIX environment, utilizing the GE GXS Enterprise System at both the application-to-application (A2A) and business-to-business (B2B) levels.

1996 **Front Range Community College Department of Environmental Science and Technology**
Adjunct Professor
Developed and taught the college course *"Introduction to Decommissioning and Dismantlement (D&D)",* SCI-191-001. The curriculum was taught during the spring and fall semesters of 1996. Classroom instruction was provided on the requirements and process for Decontamination and Dismantlement (D&D) of hazardous and radioactive equipment and facilities. Instrumental topics included:

- Project preparation and planning;
- Developing a detailed decommissioning plan and strategy;
- Establishing a project baseline for costs and schedule management;
- Decommissioning and demobilization activities involving the removal and cleanup of contaminated structures, equipment and materials, asbestos survey and abatement for both hazardous and radiological facilities;
- Dismantling and decontamination techniques;
- Waste minimization techniques;
- Industrial hygiene and radiation safety requirements and performance;
- Fire protection and site security;
- Post commissioning and environmental survey requirements and performance;
- Solid, hazardous and radioactive waste management.

1992 to 2000 **Rocky Flats Plant**
Project Manager
Project manager and design engineer of a mobile Soil Vapor E (SVE) extraction system. Per the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), corrective action for the remediation of subsurface contamination. Engineering design responsibilities included the design of the vapor extraction wells, piping systems, vacuum systems, adsorption and thermal treatment systems for extracted hazardous soil gas.

Responsible for the environmental performance of the site manufacturing, laboratory and shipping facilities designated as 559, 707, and 991. These tasks and responsibilities included the implementation of the regulatory requirements for the facility operation, review of environmental documentation affecting the facility, review of engineering design of new projects and building modifications with respect to the impact on environmental compliance.

Additional duties included ACM building and facility inspection and ACM management, the coordination and oversight of environmental and waste sampling collection, coordination and preparation of data for inclusion into various environmental reports, coordination of compliance inspections and self-assessments and the provision of direction on emergency response and notification for environmental occurrences.

Facility engineering manager for building 559, 707, and 991 manufacturing, laboratory and shipping operations. Responsibilities and tasks included: the prioritization, direction, and approval of engineering designs for facilities and programs within the approved Safe Operating Envelope (SOE); development and implementation of all facility operability documents and facility authorization documents affected by engineered modifications; development of appropriate operational readiness reviews, readiness assessments and management reviews for newly engineered systems and processes being brought into service within the facilities; project management of decommissioning and demolition activities within the project area; and management of new facility construction.

Direction and supervision of technical staff to ensure compliance with applicable requirements leading to the certification of Transuranic (TRU) waste shipments to the Waste Isolation Pilot Plant (WIPP). Provided Quality Assurance (QA) to residue packaging activities to insure compliance with the WIPP Waste Acceptance Plan (WAP), Rocky Flats Environmental Technology Site (Site) TRU Waste Characterization Quality Assurance Project Plan, TRU Waste Management Manual and subordinate documents required for waste certification. Additional duties included the functional responsibility for project staff WIPP qualification training for project staff certification audits.

1989 to 1992 **Harding Lawson Associates**
Project Manager
Provided engineering services involving the planning, analysis, design, construction, operation and maintenance of water systems and structures. Performed engineering alternatives evaluations, including CERCLA Feasibility Studies (FS), and Remedial Designs (RD) for groundwater remediation and water, wastewater, and soil treatment systems projects. The Feasibility Studies developed, screened, and evaluated in detail alternative remedial actions under CERCLA.

Designed and executed treatability studies evaluating the performance, design, and cost of a remedy for the treatment of hazardous waste using biological treatment, ion exchange, granular activated carbon, chemical precipitation, ultraviolet radiation/ chemical oxidation, solidification, and thermal treatment technologies for both solids and liquids. These treatability studies were performed to determine what technologies permanently reduced the volume, toxicity, or mobility of the hazardous substances.

Developed prescreening of technologies focusing on: 1) the potential for the process option to treat the estimated volume of contaminated media and to achieve the remediation goals identified in the remedial action objectives, 2) the potential impacts on human health and the environment during construction and implementation of the option, and 3) the documented performance of the option for treating similar contaminants and matrices.

Performed the evaluation of data from laboratory results to determine whether analytical data was of sufficient quality for the intended purpose and use. Performed Data Quality Assessment (DQA) to identify and summarize any quality control problems that occurred during laboratory analysis (QC non-conformances).

Performed remedial action alternative cost estimates for assessing capital costs, annual operations and maintenance costs, and net present value of capital and O&M costs. Performed the construction management, operation and maintenance of an ultraviolet radiation/chemical oxidation treatment facility for the treatment of high hazard liquid waste.

1986 to 1989 **IT Corporation**
Project Engineer
Project engineer for the design, construction management, operation and maintenance of Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) corrective actions for private and public sectors. Engineering responsibilities included the design of containment structures and processes for decontaminating Polychlorinated Bi-phenyls (PCBs) from structures and equipment.

Designed and operated media filtration and granular activated carbon adsorption systems for the treatment of liquid waste streams containing regulated contaminants. Supervised the collection of soil and groundwater samples containing regulated substances for analysis using diverse types of electronic and/or manual field instruments, equipment, and gauges. Analyzed environmental data to define the spatial patterns and the scales of variability, and created risk maps for use in decision-making.

1985 to 1986 **Water Services of America**
Project Manager
Performed design engineering, cost estimating, and field servicing of commercial, industrial and municipal entities for the treatment of drinking water. Design tasks included establishing the design basis requirements, developing Process Flow Diagrams and Process Data Sheets. Prepared detailed process design including Process Flow Diagrams (PFD), Mass Balance and Piping and Instrumentation Diagrams (P&ID), Mechanical Flow Diagrams, hydraulic capacity calculations for water treatment unit operations and the life cycle operating cost calculations for unit operations.

Performed engineering designs for the treatment of water using chemical flocculation and settling basins, media filtration using sand and anthracite, reverse osmosis desalination systems for the production of drinking water from both brackish and seawater sources, packed column air stripping, chemical disinfection using chlorine, ultraviolet radiation and ozonation. Designed deionization systems utilizing ion exchange media (single and dual column cation, anion exchangers, mixed beds and chelating systems). Designed granular activated carbon adsorption systems, water distribution and water storage systems.

1979 to 1982 **Bruner Corporation**
Project staff member
Performed engineering design of commercial and industrial unit operations for the treatment of industrial wastewater and drinking water, cost estimating and the start up and the training of equipment operators. Design tasks included; establishing the design basis requirements, and developing Process Flow Diagrams and Process Data Sheets. Prepared detailed process design including Process Flow Diagram (PFD) with Mass Balance and Piping and Instrumentation Diagrams (P&ID). Performed hydraulic flow calculations, system capacity sizing and life cycle operating cost calculations. Water treatment designs utilized ion exchange media (single and dual column cation and anion exchangers, mixed beds and chelating ion exchange systems). Designed pressure filtration systems using sand or woven media. Performed design of granular activated carbon adsorption systems for the treatment of drinking water.

1979 **Ford Motor Company**
U.S. Merchant Marine 3rd Assistant Engineering Officer
Various assignments as an engineer aboard vessels traversing the Great Lakes. Responsible for the supervision and work coordination of crew members who operated and maintained the ship's engines, boilers, deck machinery, and the electrical, ammonia and Freon refrigeration, and sanitary equipment.

PROFESSIONAL CREDENTIALS

Professional Engineer: NCEES, Alabama, Colorado, Delaware, Florida, Georgia, Indiana, Kentucky, Massachusetts, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, West Virginia, Wisconsin
South Carolina Class A/B Underground Storage Tank Operator, South Carolina Department of Health and Environmental Control, June 2016
ASTM Certification, Vapor Encroachment Screening on Property Involved in Real Estate Transactions, No. 4646
Project Management Professional (PMP), Project Management Institute (PMI), No. 06126 (1996)
Industrial Wastewater Operator, Class A, No. 1058, Colorado, 1992
Wastewater Operator, Class D, No. 6114, Colorado 1991
Water Works Operator, Class D. No. 4078, Colorado 1991

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Certified Hazardous Materials Manager, No. 1745, 1989
National Association of Fire Investigators – Certified Fire & Explosion Investigator, No. 20014-11662
Wastewater Operator, Grade T-ABCEGH, No. 17774, Wisconsin, 1985
Water Works Operator, Grade T-DJI, No. 17774, Wisconsin, 1985
United States Coast Guard, 3rd Assistant Engineer, Steam and Motor Any Ocean, 1979

SECURITY CLEARANCE

DOE "Q" (Inactive)

EDUCATION

M. S., Civil Engineering, University of Wisconsin, Milwaukee, 1986
B. E., Ocean Engineering, State University of New York, Maritime College, Bronx, 1979

ADDITIONAL TRAINING

Mold – Introduction, Eurofins EMLab P&K, July 2021
Strategies for Mold Investigations, Eurofins EMLab P&K, July 2021
Sewage Contamination: Microbiology, Health Risks and Remediation, Eurofins EMLab P&K, June 2021
Pesticide Label Demystified: Guidance on Understanding Pesticide Labels, EPA Center for Integrated Pest Management (IPM), June 2021
United States Pharmacopeia USP 797 - Environmental Monitoring, Eurofins EMLab P&K, June 2021
Harmful Algal Blooms and Algal Toxins, U. S. EPA's Small Water Systems Monthly Webinar Series, May 2021
Overview of Asbestos and its Management, Eurofins EMLab P&K, April 2021
Legionella - Detection Systems and New Regulations, EMLab P&K, April 2021
Overview of Asbestos and its management, Eurofins CEI, Inc., April 2021
Disinfection Byproducts Control, U. S. EPA's Small Water Systems Monthly Webinar Series, March 2021
Fungal Data Interpretation, EMLab P&K, March 2021
Combustion By-Product Testing Services - Part 2, EMLab P&K, February 2021
Fit-for-Purpose Water Updates and Life Cycle Comparisons of Non-Potable Water Reuse Scenarios, EPA's Office of Research and Development (ORD) Safe and Sustainable Water Research Program, February 2021
IPM After the Storm-Vector Considerations, Part 1, EPA Center for Integrated Pest Management (IPM), January 2021

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Wildfires and Resulting Impacts to Water Bodies Used as Drinking Water, EPA's Office of Research and Development (ORD) Safe and Sustainable Water Research Program, September 2020
SARS CoV-2 in Wastewater Monitoring: Linking Research and Application to Meet Immediate Needs, EPA's Office of Research and Development (ORD) Safe and Sustainable Water Research Program, September 2020
What Schools Need to Know Practices and Principles for Healthy Indoor Air Quality (IAQ) and Reducing the Spread of Viruses, EPA Center for Integrated Pest Management (IPM), August 2020
Water Reuse for Agricultural Purposes, EPA's Office of Research and Development (ORD) and Office of Water (OW), July 2020
Ethics and the Law for Professional to my CV Engineers, SEAK Inc., The Expert Witness Training. Webinar, May 2020
Radiochemistry: A Radiochemistry Primer, Eurofins TestAmerica, April 2020
Preventing Legionnaires' Disease: A Training on Legionella Water Management Programs, The University of Arizona, Mel and Enid Zuckerman College of Public Health, April 2020
Personal Protective Equipment for Highly Infectious Diseases, Mel & Enid Zuckerman College of Public Health University of Arizona Mountain West Preparedness & Emergency Response Learning Center, April 2020
COVID-19 Implications to Operations Compliance and Training, American Water Works Association, April 2020
Harmful Algal Blooms (HABs) and Algal Toxins, U. S. EPA's Small Water Systems Monthly Webinar Series, April 2020
Water Treatment Modeling Tools for Removing Per- and Polyfluoroalkyl Substances (PFAS) and Other Contaminants, EPA's Office of Research and Development (ORD) Safe and Sustainable Water Research Program, April 2020
Xylem Solutions Solve Clogging and Reduced Staffing Issues, Xylem Water Solutions & Water Technology Xylem US, April 2020
A Guide to Respiratory Protection, PDHClass.com, April 2020
Drinking Water Regulations 101 and Best Practices for Training Utilities, EPA's Office of Research and Development (ORD) and Office of Water (OW), March 2020
Hazardous Waste Operations and Emergency Response (HAZWOPER) 24 Hour Training, 360 Training, August 2019
Advanced Fire, Arson & Explosion Investigation Training Program, The National Association of Fire Investigators (NAFI) International, July 2019
Sanitary Surveys, U. S. EPA's Small Water Systems Monthly Webinar Series, June 2019
Managing Pests in Healthcare Facilities, EPA Center for Integrated Pest Management (IPM), April 2019
Sewage Contamination Microbiology - Health Risks and Remediation, EMLab P&K, March 2019
Rodents I - Behavior and Tracking, EPA Center for Integrated Pest Management (IPM), March 2019

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M and M's: Developing Methods to Detect Toxicity in Water using Mayflies and Mussels, EPA's Office of Research and Development, Safe and Sustainable Water Resource Research Program, March 2019
Rodents II - Prevention and Control, EPA Center for Integrated Pest Management (IPM), March 2019
Legionella and Legionellosis – Introduction, EMLab P&K, February 2019
Head Lice - Expert Panel Discussion, EPA Center for Integrated Pest Management (IPM), November, 2018
Best Practices for Ground Pesticide Applications, EPA's Office of Pesticide Programs (OPP), October, 2018
Challenges and Treatment Solutions for Small Water Systems, "Per- and Polyfluoroalkyl Substances (PFAS)", EPA's Small Systems Monthly Webinar Series, October, 2018
Safe and Sustainable Water Resource Research Program, "Onsite Non-Potable Water Reuse with Expert Panel Discussion", EPA's Office of Research and Development, October, 2018
Bed Bugs – Considerations for Health Care and Social Service Professionals, EPA's Office of Integrated Pest Management (IPM), October 2018
Flooding and Droughts, EPA's Small System Monthly Webinar Series, September 2018
Best Practices for Aerial Pesticide Application, EPA's Office of Pesticide Programs (OPP), September 2018
Using Total Aerobic Spores as a Supplemental GWUDI Determination Tool, EPA's Office of Water and Office of Research and Development, August 2018
Strategies for Pollinator Habitat Promotion and Conservation in Agricultural Areas, EPA's Office of Integrated Pest Management (IPM), August 2018
Tank Management and Distribution System Optimization, EPA's Small System Monthly Webinar Series, July 2018
Use of Microbial Source Tracking Tools in Waterborne Disease Outbreak Response, EPA's Office of Research and Development, Safe and Sustainable Water Resource Research Program, June 2018
Managing Urban Bird Pests: Canada Geese and Pigeons, EPA's Office of Integrated Pest Management (IPM), May 2018
Simultaneous Compliance: Considerations for Adjusting Treatment, EPA's Small System Monthly Webinar Series, April 2018
Pesticide Resistance Testing to Improve Mosquito Management, EPA's Center of Expertise for Integrated Pest Management (IPM), April 2018
Materials Handling Safety, OSHAcademy, Course 619, April 2018
Strategies for Managing Pesticide Spray Drift, EPA's Office of Pesticide Programs (OPP), March 2018
Bulk Silos for Biomass Facilities, SunCam Course 249, January 2018
Biomass Process Flow Calculations, SunCam Course 267, January 2018
Lead-Based Paint Visual Assessment Training, U.S. Department of Housing and Urban Development, November 2017
Decision Making in Engineering Planning and Design, SunCam Course Number 153, November 2017

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HVAC Design: Industrial Ventilation, SunCam Course 100, November 2017
Soil Erosion & Sediment Control Plans, Suncam Course Number 243, November 2017
Sustainable Streambank and Shoreline Protection, CED Engineering Course Number C06-007, November 2017
Construction Site Storm Water-Good Housekeeping, CED Engineering Course Number C02-003, November 2017
Stream Restoration, CED Engineering Course Number C07-005, November 2017
Hydrogen Sulfide Safety Course, OSHA 29 CFR 1910.1000, eTraining, Inc., August, 2017
Pests of Public Health Importance and the Role of Integrated Pest Management Schools, EPA's Center of Expertise for School Integrated Pest Management (IPM), January 2017
Potable Reuse Research Compilation: Synthesis of Findings, WRRF 15-01, Webcast by the Water Environment Federation, January 2017
Cockroaches in Your School: You Rarely Just Find One, EPA's Center of Expertise for School Integrated Pest Management (IPM), December 2016
An Introduction to Petroleum Fuel Facilities: Atmospheric Storage Tanks, Course C781, PDHonline.org, Inc./PDH Center, December 2016
Static Electricity in Industry: Preventing Explosions of Dusts and Volatile Fluids, Decatur Professional Development Course E-2021, December 2016
Forensic Analysis Involving Fugitive Natural Gas and Propane, SunCam Continuing Education Course 199, December 2016
Using Ethics to Support Excellence in Reliable & Safe Operations, Webinar by AIChE, May 2016
Professional Ethics for Engineer, PDHengineer.com, May 2016
Determining Negligence in Engineering Failures, PDHengineer.com, May 2016
Corrosion: Causes and Controls, Webcast by the Water Environment Federation, February 2016
National Association of Fire Investigators, Advanced Fire, Arson & Explosion Investigation, July 2015
National Association of Fire Investigators, Computer Fire Modeling, July 2015
EPA Technology Innovation and Field Services Division, "Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management," Webcast Sponsored by Interstate Technology and Regulatory Council, March 2015
EPA Technology Innovation and Field Services Division, "Military Munitions Support Services - Advanced Classification," Webcast Sponsored by U.S. Army Corps of Engineers, March 2015
DNAPL Source Zone Management Approaches, Webcast by the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP), January 2015
How We See Pathogens: Using Better Indicators to Detect Pathogen Presence: Webcast by the Water Environment Federation, November 2014
American Water Works Association Webcast, "Preparing for Ebola in the Water Sector," November 2014
Grinder Pumps for Basement Flood Prevention - A Best New Practice, Webcast by Water & Waste Digest, September 2014

Force Main Condition Assessment, Part 3, Virtual Panel Discussion, Webcast by the Water Environment Federation, September 2014

Odor Control 101: Successful Strategies, Innovations, and Technologies, Webcast by the Water Environment Federation, May 2014

EPA Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation Webinar Series, "Why Are So Many Groundwater Contaminant Plumes Persistent? Insights from Modeling and Characterization," February 2014

Force Main Condition Assessment, Part 1: Choosing the Right Technology, Webcast by the Water Environment Federation, February 2014

EPA Office of Superfund Remediation and Technology Innovation Webinar Series, "CEC Training for OSCs…Pipeline Emergencies," November 2013

ASTM International, "Vapor Encroachment Screening on Property Involved in Real Estate Transactions," October 2013

Environmental Contamination: Dynamic Sampling for Assessment and Remediation of VOCs – The Membrane Interface Probe, SunCam Course No. 016, September 2013

HVAC Design – Fundamentals; System Selection, Sizing, and Design, SunCam Course No. 058, September 2013

Fracking the New Albany Shale: Legal and Technical Issues Arising from the Passage of the Illinois Hydraulic Fracturing Regulatory Act (HFRA), Edwards Wildman Palmer LLP Webinar, August 2013

EPA Biopesticides and Pollution Prevention Division, Webcast; School Integrated Pest Management (IPM), "Protecting Kids from Pests and Pesticides," July 2013

Septic System Design, SunCam Course No. 077, July 2013

Project Risk Management for Site Remediation, ITRC Training Program Webinar, April 2013

Use of Risk Assessment in Management of Contaminated Sites, ITRC Training Program Webinar, February 2013

American Water Works Association Webcast, "What Revisions to TCR Will Mean for Water Systems," January 2013

Applied Math for Waste Water Treatment Plant Operators, Webcast by the Water Environment Federation, January 2013

EPA Office of Research and Development, Internet Seminar, EPA's Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: A Progress Report, January 2013

Data Quality and Validation – Part 2, Webcast by the Water Environment Federation, January 2013

Fire Safety Training per 29 CFR 1910.157(g)(4) – 29CFR 1910.28(f), www.eduwhere.com, December 2012

Data Quality and Validation – Part 1, Webcast by the Water Environment Federation, December 2012

Biosolids 101: Fundamentals of Practice, Webcast by the National Biosolids Partnership and the Water Environment Federation, October 2012

EPA Office of Superfund Remediation and Technology Innovation Webinar Series "Brownfields Road Map to Understanding Options for Site Investigation and Cleanup," October 2012

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Biofuels: Release Prevention, Environmental Behavior, and Remediation, ITRC Training Program Webinar, October 2012
EPA Office of Superfund Remediation and Technology Innovation Webinar Series "NARPM Presents…An Overview of Asbestos - Health Effects, Regulations, Sampling and Analysis, and a Case Study," August 2012
ATSDR Case Studies in Environmental Medicine: Polycyclic Aromatic Hydrocarbons (PAHs) Toxicology, Course No. WB1519
ATSDR Case Studies in Environmental Medicine: Case Studies in Environmental Medicine: Environmental Triggers of Asthma, Course No. WB1102
ATSDR Case Studies in Environmental Medicine: Taking An Exposure History, Course No. WB1109
University Technology Showcase Webinar Series "Biofilm Control in Industrial Settings," Montana State University, Center for Biofilm Engineering, January 2012
Wet Weather Disinfection: Issues and Challenges, Water and Environment Federation Internet-based Training Program, November 2011
American Water Works Association Webcast, "Understanding EPA's Radiation Monitoring Data," Course No. W1119, May 2011
National Pollutant Discharge Elimination System (NPDES) Permit Writers' Online Training Module, Internet-based Training Program, U.S. EPA Office of Waste Water Management
Characterizing a Complex TCE Groundwater Plume, Eliminating Suspected Source Areas, and Reducing Investigation Costs for a RCRA RFI at Shaw AFB, SC**,** Triad Session 6: Triad Case Studies, Internet-based Training Program, U.S. EPA Technology Innovation and Field Services Division
Using Environmental Visualization System (EVS) Modeling to Develop Remediation Alternatives, Triad Session 6: Triad Case Studies, Internet-based Training Program, U.S. EPA Technology Innovation and Field Services Division
Vapor Intrusion Pathway: A Practical Guideline (VI-1, 2007), Internet-based Training Program, US EPA Office of Superfund Remediation and Technology Innovation
Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios (VI-1A, 2007), Internet-based Training Program, US EPA Office of Superfund Remediation and Technology Innovation
Vapor Intrusion, U.S. Navy, Naval Facilities Engineering Command, Environmental Restoration Technology Transfer, Multimedia Internet-based Training
128 hours of classroom and hands-on health and safety training for hazardous waste operations and emergency response as mandated by the 1986 reauthorization of the Superfund program
Certificate of Training, Military Sea Lift Command (MSC) Fire Fighting School
Total Maximum Daily Loads: The Straight Talk, sponsored by the SC Association of Storm Water Managers
Contract Management Principles and Practices, George Washington University
Project Leadership, Management and Communications, George Washington University
PRISM Project Manager for the Cost Package, ARES Corporation, Seminar Sponsored by the Los Alamos National Laboratory, Los Alamos New Mexico

Earned Value Management System Certification Training, Los Alamos National Laboratory, Los Alamos New Mexico
PRISM Project Manager for the Cost Package, ARES Corporation, Seminar Sponsored by the Los Alamos National Laboratory, Los Alamos New Mexico
Primavera Project Manager for the Enterprise, Los Alamos National Laboratory, Los Alamos New Mexico
10CFR830 Subpart b Nuclear Safety Rule, seminar sponsored by the DOE National Nuclear Security Administration (NNSA)
Unreviewed Safety Question Process, seminar sponsored by the Los Alamos National Laboratory, Los Alamos New Mexico
Change Acceleration Process (CAP), General Electric Corporation, Boulder Colorado
Zodiac / Business and Finance Strategy, General Electric Corporation, Boulder Colorado
ISO 14000/Environmental Management Systems (EMS), Westinghouse Corporation, 1996
Project Management: The Kerzner Approach, University of Colorado at Denver, 1996
Soil Vapor Extraction, University of New Mexico, 1995
Remediation Technologies for Controlling and Containing Groundwater Contamination, National Groundwater Association, 1993
Air Transportation of Dangerous Goods, seminar sponsored by Federal Express, 1993
RCRA Corrective Action Stabilization Technologies, seminar sponsored by EPA, Denver, Colorado, 1992
Industrial Waste Treatment, Volume I, California State University, Sacramento, 1992
Management of Hazardous Materials, Colorado State University, Fort Collins, Colorado, 1990
Operation of Wastewater Treatment Plants, Volumes I and II, California State University, Sacramento, California, 1989
Treatment of Metal Waste Streams, Volume I, California State University, Sacramento, California, 1989
Project Management, American Management Association, Denver, Colorado, 1989
Proper Management of PCBs, General Electric Corporation, Denver, Colorado, 1988

EDUCATIONAL INSTRUCTOR

Provide instruction for an 8 hour Continuing Professional Education program to the Rocky Mountain Section of the American Industrial Hygiene Association (AIHA). Topics lectured were the safety considerations in robot design, installation, programming, and operation. The protective measures and complementary equipment used to safeguard machinery and equipment. The requirements and implementation of a Lockout Tagout program for safeguarding machinery and equipment. Golden Colorado, September 2015

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PROFESSIONAL MEMBERSHIPS and AFFILIATIONS

Alliance of Hazardous Materials Professionals (AHMP)
American Society of Testing and Materials (ASTM)
Committee E50 on Environmental Assessment, Risk Management and Corrective Action, Membership No. 1696445
American Water Works Association (AWWA)
Institute of Hazardous Materials Management (IHMM)
Committee member for the Job Task Analysis (JTA) to update the content outline for the Certified Hazardous Materials Manager (CHMM) Examination Program
National Association of Fire Investigators (NAFI), Membership No. 20014
South Carolina Chamber of Commerce (SCCC)
Water Environment Association of South Carolina
Water Environment Federation (WEF)

AWARDS

Los Alamos National Laboratory Principal Associate Directorate for Weapons Programs Contractor Awards Program FY2006
International Technology Corporation, Quarterly Quality Award, 1998
Environmental Health and Safety Excellence Award, Westinghouse Corporate Environmental Health and Safety Council, 1997
EG&G Rocky Flats Inc., EG&G Award of Excellence, Building Deactivation Programs, 1995
EG&G Rocky Flats Inc., Management Initiative Award, Cost Productivity Improvement, 1995
Harding Lawson Associates' Dick Harding Technical Excellence Award, 1992
Nominated for the Karen Morehouse Best Paper Award, Great Plains-Rocky Mountain Hazardous Substance Research Center, 1992
Engineering Excellence Award, Environmental Projects category EI, "Hydrazine Wastewater Treatment," Consulting Engineers Council of Colorado, 1991

PUBLICATIONS and PRESENTATIONS

Rocky Flats Building Deactivation Program "Where Are We Today" Presented at the ASME Professional Development Short Course Program, Golden, Colorado May, (with J.G. Lehew, C. S. Reed, and R. J. Schmidt), 1996

Deactivation, Decontamination, and Decommissioning Activities under CERCLA and RCRA at the Rocky Flats Environmental Technology Site, presented at ER'95 Committed to Results, Denver, Colorado, August, (with R. B. Heitland, C. M. Martin, and J.G. Lehew), 1995

Lessons Learned From Deactivation and Decommissioning at the Rocky Flats Environmental Technology Site, Presented at ER'95 Committed to Results, Denver, Colorado, August, (with J. G. Lehew and R. J. Schmidt), 1995

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Operable Unit 2 Subsurface Interim Measure/Interim Remedial Action Soil Vapor Extraction Pilot Test, Poster presented at ER'95 Committed to Results, Denver, Colorado, August, (with, D. Parson and B. O'Melia), 1995

Operable Unit 2 Subsurface Interim Measure/Interim Remedial Action Soil Vapor Extraction Pilot Test, presented at the 7th National Technology Information Work Shop, Cincinnati, Ohio, April, (with R. McLaughlin, D. Parson, and B. O'Melia), 1995

Soil Vapor Extraction of Volatile Organic Compounds at the East Trenches of Operable Unit 2. Presented at the Fifth National Technology Information Work Shop, Denver, Colorado, October, (with R. E. Madel, D. Parson, and B. O'Melia), 1993

Treatment of a Complex Liquid Matrix using Powdered Activated Carbon Treatment (PACT). Presented at the Second International Symposium on In Situ and On-Site Bio Reclamation, San Diego, California, April, (with D. C. Erickson and K. A. DeFelice), 1993

Evaluation of Pretreatment Options for a Complex Liquid Matrix. Presented at the HMC Superfund 92 Conference, Washington DC December, (with K. A. DeFelice and D. C. Erickson), 1992

Treatment of Liquid Matrixes by Advanced Oxidation Processes. Presented at the Conference on Hazardous Waste Research, University of Colorado at Boulder (with K. A. DeFelice and R. L. Kinshella), 1992

Bench-scale Evaluation of Technologies for Removal of Organic, Inorganic, and Radionuclide Contaminants from a Complex Liquid Matrix. Presented at the Conference on Hazardous Waste Research, University of Colorado at Boulder (with K. A. DeFelice and D. C. Erickson), 1992

Bioenumeration Treatability Studies for Liquids and Solids. Poster presented at the Conference on Hazardous Waste Research, University of Colorado at Boulder (with K. A. DeFelice and D. C. Erickson), 1992

Biological Treatability Studies for a Complex Liquid Matrix. Poster presented at the Conference on Hazardous Waste Research, University of Colorado at Boulder (with K. A. DeFelice and D. C. Erickson), 1992

Bench-scale Treatability Program for Chemical Fixation and Stabilization. Poster presented at the Colorado Hazardous Waste Management Society Annual Conference, Denver, Colorado, October (with K. A. DeFelice), 1991

Development of Optimal Treatment Processes and Operational Procedures for Treatment of Hydrazine Wastewater. Presented at HMCRI Research and Development Conference, Anaheim, California, February (with R. T. Jelinek and K. R. Cain), 1991

Evaluation of Adsorption Processes for the Removal of Residual Chemicals from Water Treated by Ultraviolet/Chemical Oxidation System. Presented at Superfund 90 Conference, Washington, D. C., November (with M. E. Zappi and K. R. Cain), 1990