



Antony D.G. Jones, PhD

Current Position

Senior Managing
Health Scientist

Discipline Areas

- > Microbiology
- > Food Safety
- > Site Assessment
- > Occupational Health
- > Risk Assessment

Years' Experience

18 Years

Joined Cardno

2019

Education

- > PhD, Microbiology and Molecular Biology, University of Newcastle, United Kingdom (1999)
- > BSc, Biology, University of York, United Kingdom (1993)

Summary of Experience

Dr. Antony Jones is a microbiologist with 18 years of experience in the sampling, analysis, assessment, epidemiology, exposure, and risk assessment of microorganisms. He earned a BSc. in Biology and a Ph.D. in Microbiology and Molecular Biology. He has focused his academic and consulting experience in the fields of microbial risk assessment, contaminant biodegradation and site assessment. Dr. Jones also specializes in biotechnology regulatory compliance, public and occupational health, and risk assessment. He has expertise in quantitative and qualitative microbial risk assessments of contaminants in food and beverages, and recreational and drinking water, as well as safety evaluation of contaminants associated with consumer products and public exposure to microorganisms. His experience includes investigating the causes and health effects of exposures to a variety of microorganisms including *Legionella*, Hantavirus, molds, *Salmonella*, Hepatitis, *E. coli*, as well as assessing the persistence and prevalence of antibiotic resistance. In addition, he has extensive experience conducting site assessments and assessing the rate of biodegradation of a number of contaminants in differing environments. Notable contributions that Dr. Jones has made to the field of environmental microbiology includes research on quantifying the rate of microbial degradation of polyaromatic hydrocarbons and chlorinated solvents in groundwater, characterization of contaminant degrading microbial communities in pristine and contaminant-impacted environments, and investigation of consumer and industrial exposures to *Salmonella*. In addition, Dr. Jones has evaluated regulatory compliance issues associated with USEPA TSCA MCAN, USEPA FIFRA antimicrobial pesticide registration, FDA GRAS submissions and BMP/GMP food safety-related compliance. His research interests have focused on the characterization and assessment of microorganisms, the identification of sources of microbial pathogens, and the expression of contaminant degradation pathways. More recently, his research has focused on mechanisms used by microorganisms to survive stress environments, including biotechnology regulatory compliance, consumer product safety, microbial risk assessments, and the use of antibiotic resistance genes and other stress-survival techniques. Dr. Jones has published over 24 abstracts, book chapters, presentations and peer-reviewed papers on various microbial assessment, site assessment and risk-related topics.

Significant Projects

Microbial Risk and Public Health Assessment

Conducted a literature review of the state of the science for removal of Active Pharmaceutical Ingredients (APIs), antibiotic resistant bacteria (ARBs) and antibiotic resistance genes (ARGs) for a pharmaceutical client, assessed best available current technologies for removal of API, ARB and ARGs from wastewater and potential novel technologies and presented findings to the client.

Assessed the uptake of particulate metals including lead, by microorganisms at a lead mine tailing pond in Idaho, tested rates of uptake by the cyanobacteria and developed

remedial methods to mitigate off-site dispersal of the cyanobacteria and the associated particulate lead contained within the cyanobacteria.

Provided technical litigation support to testifying expert witness on multiple *Legionella* outbreaks at hotels and commercial facilities. Outbreaks were related to water features in the lobby of the hotels, cooling towers, or hot tubs and pools within the facilities.

Served as a technical expert on a Hantavirus outbreak case in California in 2012, providing technical litigation support to testifying expert witness, and preparing summaries on epidemiology and microbiology of Hantavirus.

Served as a technical expert on a case involving alleged moldy odors associated with a lease-return vehicle. Based on lessee allegations, fungal sampling was conducted in vehicle indoor air, external air as a control, fungal and bacterial swab samples were collected of vehicle air conditioning vents, internal air conditioning (AC) components and fluid reservoirs. Samples were compared to background levels and no indication of elevated concentrations of fungal material discovered.

Conducted multiple mold assessments and mold abatement at laboratory, research and development or manufacturing facilities, medical record storage facilities and private residences in Southern California. Also assisted a testifying expert in a litigation case related to alleged water intrusion at a private residence in Michigan. Tasks included reviewing laboratory enzyme-linked immunosorbent assay (ELISA) methodology including detection limits against plaintiff allegations.

Conducted an epidemiological assessment of perceived cancer clusters associated with a manufacturing facility. The assessment included conducting a site assessment of the facility and interviews with knowledgeable personnel to determine potential occupational chemical exposures, and an epidemiological review of the identified clusters and potential association with any chemical exposures at the facility.

Food Safety and Regulatory Compliance

On behalf of the client a root cause analysis (RCA) was conducted to identify the potential sources of *Salmonella* in a food product, which included microbial sampling at a quarry in California, and a production facility in Arizona. Samples were collected for fecal indicator bacteria (FIB) analysis and *Salmonella*, and bacterial source tracking (BST) was conducted on samples positive for *Salmonella* using the human and non-human *Bacteroides* markers. The source of *Salmonella* was identified as a coyote, enabling targeted best management practices (BMPs) and good manufacturing practices (GMPs) to mitigate future contamination.

Technical expert on an *E. coli* outbreak associated with a leafy green product that was identified as the source of an *E. coli* outbreak in 2015. A RCA was conducted to identify potential other sources of *E. coli* within the food chain and to address plaintiff allegations. Included was a review of production, processing and transport records, as well as distribution and County Health Department inspections and records at the product point of sale, an inspection was conducted of the growing fields, production and packaging facility.

Conducted traceback analysis and litigation support when pomegranate arils were identified by the Food and Drug Administration (FDA) as the source of a Hepatitis A (HAV) outbreak in 2013. Other potential sources of HAV within the product distribution line were identified and a thorough review of the molecular techniques used to identify

potential global sources of HAV prepared by the Centers for Disease Control (CDC) was conducted, and weaknesses in those molecular techniques identified that highlighted an alternate source of contaminated pomegranate arils.

Conducted a microbial assessment into the source of an *Aeromonas hydrophila* outbreak in a freshwater lake at a public golf course in Southern California, and assessed the likely occupational and human health risk (potential exposure pathways assessed included ingestion of lake water and contaminated ducks). The microbial pathogen had been identified through necropsy as the cause of fish and bird kills at a lake by the Veterinary School of Medicine at UC Davis. An *Aeromonas* monitoring program was developed with collaboration from the University of Oregon. Quarterly sampling was conducted at the lake, and an unaffected control and samples were analyzed for *A. hydrophila*, using 16S ribosomal gene analysis and biochemical parameters such as temperature, dissolved oxygen and pH. Mitigation measures included the adoption of BMPs and aeration of the lake to increase dissolved oxygen concentration.

Conducted multiple microbial risk assessments of food products associated with litigation support, serving as a technical expert on multiple cases in which food products were contaminated with microbial, physical or chemical contaminants. Conducted screening-level health risk assessments of microbial contamination of multiple food and beverage products, contaminated with a range of microorganisms including *Clostridia* spp., *Bacillus* spp., a broad range of fungal contaminants, metal and glass fragments and chemical contaminants.

Assisted a tile-manufacturing company register a tile product with antimicrobial claims with the United States Environmental Protection Agency (USEPA) Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) antimicrobials group. Tasks included reviewing existing efficacy studies developing novel study protocols and presenting recommendations and protocols to the USEPA antimicrobials group in Washington, D.C.

Prepared whitepapers on the use of metagenomics for developing bioforensic signatures for Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) incidents, and on the generation of features of significance in bioforensics from genetic material. Whitepapers included detailed reviews on the various benchtop sequencing methods available for next generation sequencing (NGS) and various computational analytical algorithms.

Prepared a GRAS notification submittal for a *B. coagulans* probiotic supplement. Prepared microbial characterization of *B. coagulans* used as components in a beverage in support of a GRAS notification submittals. The submittals required a detailed understanding of the microbiology of the strain, as well as potential safety concerns with acquisition of toxic-elements. Due to potential concerns of strain identity and the presence of toxin producing genetic components, detailed molecular analysis of the strain was conducted as well as traditional microbiology characterization techniques.

Prepared a GRAS notification submittal for the use of *A. platensis* in a commercial beverage product. Prepared microbial characterization of *A. platensis* (cyanobacteria) used as components in a beverage in support of a GRAS notification submittals. The submittals required a detailed understanding of the microbiology of the strain, as well as potential safety concerns with acquisition of toxic-elements.

Prepared a GRAS notification submittal for the use of *C. vulgaris* in a commercial beverage product. Prepared microbial characterization of *C. vulgaris* used as components in a beverage in support of a GRAS notification submittals. The submittals required a detailed understanding of the microbiology of the strain, as well as potential safety concerns with acquisition of toxic-elements.

Prepared two Toxic Substances Control Act (TSCA) microbial commercial activity notice (MCAN) exemption submittals associated with the proposed use of genetically engineered yeast strains at two cellulose-based ethanol pilot plant refineries. The submittals required a detailed understanding of the host microbial strain and the donor microorganism, as well as biosafety components for the treatment of any waste containing the genetically modified yeast strains.

Developed microbial assessment protocols in accordance with GMPs at paper mills and paper packaging facilities for food-contact substances. The microbial assessment protocols were developed to reduce the microbial burden associated with the food-contact paper products.

Stormwater, Surface Water and Drinking Water Exposure Assessments

Retained as an expert witness by defendants in a criminal case involving alleged violations of the Clean Water Act after several significant storm events occurred on Oahu. Stormwater was discharged from a sanitary landfill to the ocean to prevent a berm collapse. Characterized and evaluated the presence of FIB in the storm water discharges, characterized of local sources of sewage sludge that had been disposed at the landfill and identified multiple potential sources of FIB upgradient and downgradient of the alleged source.

Assessed potential sources of FIB within the AES power plant in Huntington Beach, CA on behalf of the California Energy Commission (CEC). Bacterial contamination of beaches in Southern California in the late 90s/early 2000s resulted in significant loss of recreational sources and economic losses. The assessment was conducted of the AES power plant in Huntington Beach to assess the potential sources of fecal bacteria impacting the City of Huntington Beach and the adjacent State beach in Southern California. The assessment focused on terrestrial and marine sources of bacteria associated with AES, and required a continuous three-month sampling program of coastal and freshwater samples with a two-week period of around the clock sampling. Samples were analyzed for FIB and BST. Cooling water discharge was modeled using Fluorescein dye and oranges released from the power plant cooling water discharge.

Associated with the investigations into sources of FIB in coastal waters of Southern California, several FIB source assessment and review tasks were conducted on behalf of the City of Huntington Beach. Groundwater samples were collected in the vicinity of sanitary sewers in downtown Huntington Beach to assess for leaks. Groundwater samples were also collected in the vicinity of the Orange County Sanitation District (OCSD) plant in Huntington Beach and analyzed for FIB. Oceanographic and FIB data in the nearshore vicinity of the OCSD plant and Huntington Beach beaches were reviewed and findings presented to a public meeting of the City Council.

Prepared rebuttal comments to proponent planning documents (equivalent to environmental impact reports) proposing a dairy farm in Hawaii. Comments included a

review of microbial pathogens associated with dairies, and an assessment of fate and transport of microorganisms in surface waters and groundwater in tropical climates.

Assisted a municipality in identifying potential sources and contributing factors behind presence of microbial contamination, including pathogens in public water supply. Low residual-chlorine in portions of the system was identified and the system shocked to resolve the problem.

Investigated potential sources of FIB in residential water supply after complaints from customers. Sampling for FIB, chemical and radiological analytes was conducted in residences and at the water supply tanks and wellheads supplying the tanks.

Consumer Product Safety

Assisted an international hotel corporation in the development of a clothing and footwear rental program for use at hotels and gymnasiums. Assessed various methods of sanitization and disinfection of clothing and footwear post-use and provided recommendations on the development of the rental program to mitigate brand risks and prevent disease transmission.

Developed and implemented testing methodology to assess the efficacy of disinfecting systems for red-bag waste at medical facilities. Red-bag waste includes sharps, biological agents, hazardous chemicals and radiological compounds. The disinfection process was designed to treat microbial burden to satisfactory levels and dilute soluble hazard chemicals below regulatory sewer discharge levels. Once treated the red-bag waste could then be safely used for recycling of metals, plastics and glass.

Assessed level of contamination within a personal care product and conducted a limited health risk assessment. Advised client on risk-based recall response.

Assessed level of contamination of a cork board product, flexible hose and other consumer-based products and conducted limited health risk assessments. Advised client on risk-based recall response.

Following water damage to plush toy storage warehouse with over one million units of product, provided advice on recall options, and statistical basis for product sampling to minimize client liability to an acceptable level from both a public health and brand perspective. The strategy was based on the acceptable level of risk to the client based on a per-unit assessment and remediation cost. Ultimately the risk to brand recognition outweighed the assessment and remediation costs and a settlement was negotiated with the client's insurance company. The assessment was conducted in association with the Consumer Product Safety Council.

Occupational Health

Conducted occupational silica exposure assessments at glass bottle recycling and manufacturing facilities ahead of the new OSHA regulation on silica exposure. Samples were collected using personal sampling and area sampling pumps to measure respirable silica contamination.

Conducted numerous assessments and abatements of PCB-containing materials including caulking and paints at multiple school locations.

Provided litigation support and conducted an assessment of occupational exposure to sodium hydroxide and phosphoric acid during specific cleaning tasks at a food manufacturing facility. Staff at the facility were set up with personal sampling devices, and ambient air samples were collected during a 24 hour clean in place (CIP) cycle at the facility. Data collected was used to assess compliance with OSHA personal exposure levels (PELs).

Conducted litigation support in multiple alleged asbestos exposure cases. Tasks included reviewing files, documenting occupational chronology, and developing occupational exposure to specific sources of asbestos.

Sampling of a private vehicle was conducted after customer complaints of petroleum odors associated with a lease-return private vehicle. A review of results indicated the odor was associated with naturally occurring plants in the desert habitat where the vehicle was typically parked, and damage to the seat covering was associated with personal care products worn by the driver of the vehicle.

Conducted a heat stress assessment of farm workers installing and removing irrigation pipe in the Central Valley and Salinas regions of California. Compared heat stress between workers with and without tractor-trailer support to reduce walking distance. Analysis included reduction heat stress exposure and slip and trip hazards. The report was used in litigation with Cal-OSHA to amend current regulations governing the use of tractor-trailers to transport workers.

Environmental Risk Assessment

Assisted in the preparation of an ecological risk assessment (ERA) and human health risk assessment (HHRA) of a Superfund facility in Cape Girardeau, Missouri. The principal contaminants at the site were trichloroethene (TCE) and polychlorinated biphenyls (PCBs) generated from transformer recycling at a site located in fractured karst geology. The ERA focused on potential impacts to an off-site wetland from PCBs, hydraulically connected to the site. The HHRA focused on occupational exposure and nearby residential exposure to chlorinated volatile organic compounds (VOCs).

Conducted a multi-stage site investigation and screening level health risk assessment at the Brentwood School in Los Angeles to address public and parent concerns of buried radiological waste. Tasks included sampling surface and subsurface soils for radiological contaminants on three separate occurrences, preparing reports for the school board and presenting findings to the school board and interested parties at a public school meeting.

Conducted a public health survey and baseline health risk assessment of three Omnitrans fueling facilities in accordance with the requirements of California Senate Bill 1927. SB1927 was generated out of public health concerns of residents living near the Omnitrans fueling facility in San Bernardino. The assessment concluded with a public presentation to the Omnitrans Board.

As part of the remedial investigation/feasibility study (RI/FS) at a 429-acre site in southern California at which explosives, solid rocket motor fuel, cryogenics, petroleum hydrocarbons, hypergolic fuels and solvents were used, in-situ chemical oxidation (ISCO) was proposed as the remedial option. Immediately downgradient of the proposed ISCO remedial area was an area of ongoing reductive dichlorination. The assessment consisted of collecting and comparing biofilm and filtered groundwater samples, assessing microbial populations using terminal restriction fragment length polymorphism

(TR-FLP) and Phylochip™, and chemical analysis of VOCs and metals in groundwater samples. The program included development of sampling and analytical methodologies and involved collaboration with the Universities of California Santa Barbara (UCSB) and the University of California, Berkeley (UC Berkeley).

Assessed in-situ biodegradation of naphthalene and benzene at a former manufactured gas plant (MGP) before, during and after the implementation of an air-sparge curtain designed to increase aerobic biodegradation and prevent off-site migration of the two contaminants. Organic and non-organic potential constraints to biodegradation at the site were assessed using the biosensor HK44.

Assessed in-situ biodegradation of benzene, toluene, xylene, and ethylbenzene (BTEX) at several paint manufacturing facilities in Belgium, Brazil, and France and assessed degradation constraints using the biosensor HK44.

Radioactive Waste Reduction, Atomic Weapons Establishment, United Kingdom. Assisted in development of a liquid waste reduction strategy through biodegradation of radioactively contaminated hydraulic cutting fluids into a radioactive biosludge with approximately 90% waste volume reduction.

Provided microbiological expertise assessing biodegradation and natural attenuation of BTEX and methyl-tert butyl ether (MTBE) used by a national fuel retailer at over 35 retail sites in Orange County. Historic releases of fuel had impacted groundwater throughout the county. The assessment characterized the extent of impacts from fuel releases, the likely remediation costs if natural attenuation was selected as a remedial strategy, the timescale for closure and whether natural attenuation would be protective of human health and the environment.

Provided microbiological expertise assessing biodegradation and natural attenuation of perchloroethylene (PCE) used by dry-cleaning facilities at over 20 sites city-wide. Historic releases of PCE had impacted groundwater city-wide over decades of use of the dry-cleaning solvent. The assessment characterized the extent of impacts from the use of dry-cleaning solvents, the likely remediation costs if natural attenuation was selected as a remedial strategy, the timescale for closure and whether natural attenuation would be protective of human health and the environment. The assessment was conducted as litigation support on the case.

Assisted in the initial investigation to characterize the release of fuel at an Alpine ski resort maintenance facility in the Sierra Nevada mountains in California. Assisted in the design, implementation, operation and reporting of soil-vapor extraction and ex-situ groundwater treatment systems, and prepared quarterly monitoring reports for the Lahontan Regional Water Quality Control Board. Provided microbiological technical support in evaluating the ability of biological granular activated carbon (GAC) to degrade hydrocarbons present in extracted groundwater from the ex-situ groundwater treatment system. The system was initially designed for adsorption of MTBE onto the GAC, however favorable conditions resulted in MTBE biodegradation within the GAC, and the system was adapted to encourage further growth and MTBE biodegradation within the GAC system, resulting in reduced carbon change outs and cost saving by the client. An assessment of natural attenuation of BTEX and MTBE associated with the release was also performed to assist with the development of remedial interventions to be protective of water resources in the watershed.

Provided microbiological expertise assessing on-going natural attenuation of chlorinated solvents in a karst bedrock environment at the Missouri Electric Works, Cape Girardeau, Missouri. Surface soil contamination at the site had been remediated by thermal desorption. Natural attenuation was selected as a remedial strategy for chlorinated solvent groundwater impacts, the assessment characterized whether natural attenuation would be protective of ecological risks at nearby receptors.

A conceptual site model (CSM) was developed for a 429-acre site in southern California at which explosives, solid rocket motor fuel, cryogenics, petroleum hydrocarbons, hypergolic fuels and solvents were used. An assessment of background arsenic concentrations was included in the CSM. Based on the CSM, a RI/FS was conducted, focusing on the multiple different sources of different chemicals for seven operable units at the site. Technologies proposed within the RI/FS consisted of ISCO using infiltration trenches, monitored natural attenuation, a hydraulic containment system with ISCO, thermal desorption and phytoremediation. Contaminants at the site consisted of predominantly chlorinated VOCs. Included within the RI/FS were several pilot studies to assess proposed technologies.

As part of the on-call services for the Port of San Diego, a subsurface soil investigation was conducted to assess potential historic releases of fuels and MTBE at a former fueling facility. Fuel and MTBE soil concentrations were below regulatory remediation thresholds and human health risk thresholds and no further action was required.

Conducted hydrogeological investigation to assess shallow surface water levels in relation to the development of the South Bay Expressway on behalf of Hensel Phelps.

The Gran Havana Cigar Factory, located in downtown San Diego, was the subject of an eminent domain order served by the San Diego Redevelopment Agency. The order was based on property condemnation due to alleged elevated concentrations of subsurface lead and other compounds. On behalf of the client, subsurface soil under the existing Gran Havana store was characterized and compared to background conditions for the region and compared to human health risk screening levels, provided ongoing technical expertise and litigation support on the case.

Multiple Phase II ESAs, Various clients. Conducted multiple, soil, soil gas, groundwater, indoor air assessments and screening-level risk assessments at a range of additional commercial and industrial facilities in addition to those highlighted above.

Environmental Site Assessments (ESAs) and Compliance Assessments

Managed and conducted over 200 tenant exit audits of biotechnology facilities, research and development facilities and manufacturing operations in Southern California, Texas, and Colorado. The audits were designed to assess the potential re-occupancy risk from the use of chemical, biological, radiological and nuclear hazards in the facilities. The audits including reviewing the biological inventory and biosafety level (BSL) in use at each facility to determine if appropriate decontamination procedures had been followed, hazardous waste manifests, permit closeouts, physical inspections and a review of radioactive material use to confirm appropriate decontamination of radioactive material and decommissioning of the tenant space.

Conducted multiple Phase I ESAs and Compliance Assessments for a variety of clients in mergers and acquisition transactions. Conducted in excess of 200 due-diligence

associated ESAs and compliance assessments at various sites in California, Colorado, Nevada, Oregon, and Texas in addition to the highlighted ESAs below:

- > Conducted an assessment of the former Los Angeles Air Force Base, with a limited screening health-risk assessment, enabling subsequent redevelopment for residential use.
- > Conducted a Phase I ESA of the former Howard Hughes property in Playa Vista, including 11 buildings, the former runway and the hangar where the Spruce Goose was manufactured.
- > Completed a Phase I ESA and compliance assessment of an approximately 3,200 acre ski resort in the mountains around Lake Tahoe. The assessment included mountain operations, a fueling station, retail outlets and accommodation.
- > Conducted a Phase I ESA at an approximately 1,400-acre rural undeveloped site in support of potential redevelopment.
- > Conducted multiple Phase I and compliance assessments of cement and asphalt manufacturing facilities, and associated aggregate mines in Tucson, Arizona.
- > Conducted multiple Phase I and compliance assessments of commercial business parks in Memphis Tennessee, consisting of over 100 business units. As a result of the assessments, two business units were removed from the portfolio and entered into the State Voluntary Cleanup program for soil and groundwater impacts.
- > Conducted a Phase I ESA and compliance assessment of two bakeries in Southern California as part of a consolidation program. The compliance assessment of one bakery identified a previously unidentified large source of VOCs, considered a 'major source' subject to Title V in the South Coast Air Basin.
- > Conducted a Phase I ESA of 16 agricultural parcels totaling over 700 acres in Blythe, CA.
- > Biotechnology facilities in Southern California, China and India, conducted multiple Phase I ESAs in support of potential acquisitions of laboratory, research and development or manufacturing facilities.

Regulatory Interaction

Conducted a review of the role of Triclosan™ in generating and transmitting antimicrobial resistance. The review was conducted in response to the European Union Directorate-General for Health & Consumers Scientific Committee on Consumer Safety Opinion on Triclosan, released on 22 June 2010, the review assessed the known causes of antimicrobial resistance, propagation within the environment and the role of stressor agents in increasing expression and dissemination of antibiotic resistance.

Assisted a homeopathic company in compliance with the USEPA FIFRA antimicrobial pesticide registration requirements after initially making pesticidal product claims. Tasks including reviewing existing product labels and descriptions and advising the client on submitting pesticide registration packets to the USEPA.

Other Research

Smoke-damaged clothing is frequently submitted to specialized dry-cleaning facilities to remove odors and particles associated with smoke-damage. Cleaning methods include ozonation, followed by dry cleaning. Due to insured concerns of ozonation by-product formation, an assessment was conducted on behalf of an insurance company on the efficacy of this approach using clothing from a fire-damaged property and comparable clean clothing. Smoke-damaged clothing and new clothes acting as controls were collected in tedlar bags and submitted for VOC analysis, the clothes were re-tested after cleaning at a dry-cleaning facility.

The potential generation of temporary intermediary products of regulatory concern was investigated during the use of sodium permanganate to remediate TCE in groundwater. Groundwater from the site was spiked with VOCs representative of site conditions and amended with permanganate at high concentrations. Despite the technical challenges of detecting low concentration intermediary products in high permanganate concentrations, the development of low concentrations of intermediary products of ISCO were demonstrated along with their transient nature, enabling an assessment of negligible health risk from intermediary products during remediation to the satisfaction of the regulatory agency.

The potential generation of hexavalent chromium (Cr(VI)) during ISCO with sodium permanganate was investigated. During pilot studies associated with a RI/FS, groundwater samples were collected in the vicinity and adjacent to an area of sodium permanganate ISCO. Elevated levels of Cr(VI) prompted a bench scale investigation, which demonstrated three sources of Cr(VI); naturally occurring Cr(VI) in soil, oxidized well screen material and impurities in the sodium permanganate ore. Based on the results of the bench scale study, the RI/FS was revised to use infiltration galleries and potassium permanganate of a higher grade.

Professional Experience

Senior Managing Health Scientist, Cardno ChemRisk (Formerly ChemRisk),
January 2019 – present.

Specialize in areas of microbiology, food safety, site assessment, occupation health, risk assessment, and state-of-the-art analyses involving occupational, residential and consumer product settings.

Managing Scientist, Geosyntec Consultants Inc, Dec 2016 – Jan 2019.

Provided consulting services involving Phase I and Phase II ESAs, biodegradation assessment and characterization, cancer cluster epidemiology, and antimicrobial pesticide registration.

Managing Scientist, Exponent, Sept 2012 – May 2014 and Sept 2014 – 2016.

Specialized in areas of microbial risk assessment and exposure assessment including public health (*Legionella*, Hanta Virus, Valley Fever, mold), food safety (outbreak management, traceback and traceforward analysis and BMP/GMP), stormwater and surface waters and consumer product safety. Also assessed microbial community structure of naturally occurring hydrocarbon seeps and compared to microbial community structure after hydrocarbon releases in the Gulf of Mexico.

Senior Manager, Roux Associates, May 2014 – Sept 2014.

Provided consulting services involving Phase I ESA and compliance assessments associated with merger and acquisitions transactions.

Senior Manager, ENVIRON, July 2005 – August 2012.

Provided consulting services involving antimicrobial pesticide registration, treatment efficacy of hospital sanitation processes, FDA GRAS determinations, tenant exit audits of life science facilities assessing safety for reuse after assessing risks of biological, chemical and radiological use in the facility, screening level risk assessments, Phase I environmental site assessments (ESA) and compliance assessments associated with merger and acquisitions transactions, Phase II ESAs including assessing rates of microbial degradation and phytoremediation of chlorinated solvents, and.

Senior Microbiologist, Komex, April 2001 – May 2005.

Provided litigation consulting services specializing in assessing microbial degradation of chlorinated solvents and petroleum hydrocarbons in soils and groundwater. Conducted assessments of microbial contamination of surfzone water, groundwater and surface water in the vicinity of Huntington Beach, CA.

Postgraduate Researcher, Department of Biology, School of Life Sciences, King's College London, London, United Kingdom, January 1998 – April 2001.

Managed a microbial and molecular biology laboratory, which focused on using classical microbial and molecular techniques to assess the rates of degradation of organic pollutants in the environment including analysis of microbial community structure, presence of DNA and expression of RNA for synthesis of proteins involved in aromatic ring cleavage (mono and dioxygenase), protein structure of dioxygenase enzymes, use of biomarkers to identify microbial metabolic constraints. Conducted research under a Natural Environment Research Council (NERC) grant "Hydrobiological controls on biodegradation of naphthalene", 1998. Served as Departmental Radiation Safety Officer.

Certifications

- > OSHA 40-hour HAZWOPER Certification (2001) and 8-hour hazardous waste Health and Safety Supervision (present)

Memberships and Service to Professional Societies

- > American Society of Microbiology (ASM)
 - Southern California American Society of Microbiology
- > American Industrial Hygiene Association (AIHA)
- > Royal Society of Biology (RSB)
- > Sustain SoCal/Clean Tech OC
 - Chairman 2019
 - Board of Directors 2009 to present
- > Riverside and San Bernardino County Bar Associations

Publications

Peer-Reviewed Publications

- > Mittelman, M.W. and A.D.G. Jones. 2018. A Pure Life: The Microbial Ecology of High Purity Industrial Waters. *Microbial Ecology*. 76:9-18.
- > Sercu B, A.D.G. Jones, C.H. Wu, M.H. Escobar, C.L. Serlin, T.A. Knapp, G.L. Andersen and P.A. Holden. 2013. The influence of in situ chemical oxidation on microbial community composition in groundwater contaminated with chlorinated solvents. *Microbial Ecology*. 65:39-49.

Book Chapters

- > Lori, A.M., J. Hellerstein, J. Lowe, P. Sheehan, A.D.G. Jones, R. Roy, R. Goldman, J. Walton and P. Adams. 2018. Product Exposure Assessment. In *Professional Practices of Product Stewardship*. (Ed) Gail Hart ISBN-13: 978-1-935082-85-9.
- > Hart, G.A., A.M. Lori, J. Hellerstein, J. Lowe, P. Sheehan, A.D.G. Jones, R. Roy, R. Goldman, J. Walton and P. Adams. 2018. Product Risk Characterization. In *Professional Practices of Product Stewardship*. (Ed) Gail Hart ISBN-13: 978-1-935082-85-9.

Presentations

- > Sower, G., A.D.G. Jones and G. Thompson. 2011. Regulatory pathways for foods, feeds, and dietary supplements. Platform presented at the 5th Algal Biomass Summit, Minneapolis, MN, October 25-27, 2011.
- > Sower, G., A.D.G. Jones and G. Thompson. 2010. Regulatory pathways for foods, feeds, and dietary supplements. Platform presented at the 4th Algal Biomass Summit, Phoenix, AZ, September 28-30, 2010.
- > Pearson, E., A.D.G. Jones, C.L. Serlin, M.H. Escobar, B. Sercu, P.A. Holden, C. Wu and G. Andersen. 2010. Microbial community composition during in situ chemical oxidation with permanganate. Presented at the 7th International Battelle Conference, Remediation of Chlorinated and Recalcitrant Compounds, May 26, 2010.
- > Pearson, E., A.D.G. Jones, C.L. Serlin and M.H. Escobar. 2010. Prevalence and persistence of hexavalent chromium during ISCO of trichloroethylene with permanganate. Presented at the 7th International Battelle Conference, Remediation of Chlorinated and Recalcitrant Compounds, May 26, 2010.
- > Jones, A., M.H. Escobar, C.L. Serlin, B. Sercu, P.A. Holden, R. Stollar and P. Murphy. 2009. Microbial community composition assessment during ISCO with permanganate. Battelle In Situ and On site Bioremediation Symposium, May 7, 2009.
- > Sercu, B, C.L. Serlin, M.H. Escobar, A.D.G. Jones, and P.A. Holden. 2009. Microbial community composition throughout in situ chemical oxidation of trichloroethylene with permanganate. AEHS West Coast Conference, March 10, 2009.
- > Jones, A.D.G., C.L. Serlin, G. D. Havalias, M. C. Echarte and M.H. Escobar. 2009. Prevalence and persistence of hexavalent chromium during ISCO of TCE with permanganate. AEHS West Coast Conference, March 10, 2009.

- > Jones, A.D.G., W. Major and L. White. 2008. AES Huntington Beach surfzone water quality study. 2008 Headwaters to Oceans (H2O) conference, Long Beach, CA, October 29, 2008.
- > Escobar, M. H., A.D.G. Jones and C.L. Serlin. 2008. Evaluation of the effects of ISCO on TCE-impacted ground water in weather granitic mass. Redox Technologies Conference, San Diego, CA, September 22, 2008.
- > Jones, A.D.G., C.L. Serlin and M.H. Escobar. 2008. Assessing sources of hexavalent chromium during in situ chemical oxidation of trichloroethylene with permanganate. Redox Technologies Conference, San Diego, CA, September 22, 2008.
- > Sercu B, A.D.G. Jones and P.A. Holden. 2007. Advanced bacterial community analysis for groundwater remediation. The 17th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, and Water, March 19–22, 2007, San Diego, CA, 2007.
- > Jones A. D. G. and W. Major. 2003. The role of the AES powerplant in surf zone water quality of Huntington State Beach, California. Proceedings of Oceans 2003; 3: 1487–1488.
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Professional and Academic Lectures and Courses

Grants

J. R. Mason, Ph.D. and A. B. Butler (Principal Investigators)

Natural Environment Research Council (NERC), United Kingdom, January 1998 to April 2001.

Role: Co-investigator

Hydrobiological controls on the biodegradation of PAHS associated with MGPs.

- > The purpose of the research was to assess the various hydrogeological, chemical and biological constraints that limit biodegradation of PAHs, specifically naphthalene in the natural environment. Hydrogeological controls included redox chemistry, soil porosity and associated groundwater flow rates. Chemical constraints including the rate of desorption from organic material in the soil and biological constraints included toxicity of the PAHs, and diversity and biodegradative potential of the microbial community.