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Engineering & Scientific Consulting

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Professional Profile

Ms. Caviness has over 25 years of professional experience in the environmental field and human health risk assessment. Specific areas of emphasis include risk-based property assessment, vapor intrusion, air toxics, estimation of exposure to chemicals in consumer products, strategic risk management planning, and risk communication.

She has managed or performed human health risk assessments for over 300 contaminated sites. These assessments included evaluation of a wide range of contaminants, media, and exposure pathways at Sites situated in different geographical locations and environmental settings.

Ms. Caviness specializes in polychlorinated biphenyls (PCBs), dioxins, pesticides, and chlorinated solvents, including tetrachloroethylene (PCE), trichloroethylene (TCE), and vinyl chloride. As a member of the Interstate Technology and Regulatory Council (ITRC) per and polyfluoroalkyl substances (PFAS) team, Ms. Caviness led preparation of monthly updates of ITRC tables that summarize state and federal standards and guidance values for PFAS in water and soil.

Ms. Caviness' expertise also includes conducting and directing studies to assess potential exposures associated with vapor intrusion of chemicals into indoor air. She has performed risk assessments, soil vapor modeling, and has applied multiple lines of evidence to support vapor intrusion analyses and develop risk management strategies at numerous sites. She has designed and implemented indoor air monitoring plans to evaluate potential vapor intrusion into buildings and support source identification and attribution studies.

Ms. Caviness has also managed and performed air toxics human health risk evaluations of emissions from multiple facilities in support of California Environmental Quality Act (CEQA) analyses and the California Air Toxics Hot Spots Program (AB-2588). Facilities evaluated include universities, airports, manufacturing facilities, and mining operations.

Further, she has conducted numerous exposure assessments associated with use of consumer products and analyzed results for compliance with California's Proposition 65. Services have included deriving and critically evaluating No Significant Risk Levels (NSRLs) and Maximum Allowable Dose Levels (MADLs), designing exposure simulation and analytical test protocols and providing support for litigation and negotiations.

Ms. Caviness has also prepared risk communication materials for numerous clients; these materials have been used to communicate and interpret the results of human health risk assessments to the public, client corporate and internal staff, and public relations firms. She frequently interacts with state and federal regulatory agencies and has provided risk communication training to a California regulatory agency. She

presents technical information at client/agency and stakeholder meetings and has provided risk communication support for clients at public hearings and community meetings.

Academic Credentials & Professional Honors

M.P.H., Public Health, Boston University, 1992

B.S., Clinical Psychology, Tufts University, 1986

Prior Experience

Senior Risk Assessor, GSI Environmental Inc., Oakland, CA, 2014-2019

Managing Scientist, Health Sciences Practice, Exponent, 2012-2014

Senior Manager, Health Sciences Practice, ENVIRON International Corporation, 2000-2012

Risk Assessor, Tetra Tech EM, Inc., 1995-1999

Environmental Scientist, Weiss Associates, 1992-1995

Environmental Specialist, Boston Public Schools, 1990-1992

Environmental Legal Assistant, Schnader, Harrison, Segal, and Lewis, 1988-1990

Professional Affiliations

Alameda County Bar Association (ACBA), Member of Executive Environmental Committee, 2017 to Present

Genetic and Environmental Toxicology Association (GETA)

Groundwater Resources Association (GRA)

Interstate Technology and Regulatory Council (ITRC). Author, PFAS Regulation, Toxicity, and Risk Assessment

Society for Risk Analysis (SRA)

Women in Environment (WIE), Mentor – 2019 Mentoring Program

Publications

Caviness, G, and S. Block. Supplement to California Vapor Intrusion Guidance: Implications for Property Owners, Acquisition and Redevelopment in California. Alameda County Bar Association (ACBA) Journal. February 2019.

Dorrance, L., G. Caviness, G, and L. Hall. Can PFAS Bankrupt Your Business? Alameda County Bar Association (ACBA) Journal. February 2019.

Interstate Technology Regulatory Council (ITRC). 2017 to Present. Develop monthly updates to tables presenting Standards and Guidance Values for PFAS in Groundwater and Soil. <https://pfas-1.itrcweb.org/fact-sheets/>

Interstate Technology Regulatory Council (ITRC). 2017. PFAS Regulations, Guidance, and Advisories

Fact Sheet. Co-author.

Scofield R, Caviness G, Posson M. Unique risk communication challenges posed by estimating human health risks for diesel exhaust. Air and Waste Management Annual Conference and Exhibition, Portland, OR, June 24–27, 2008.

Daugherty, D.D., K. Dehuff, and G. Caviness. Case Study of a Potency-Weighted Emission Screen. Environmental Progress (Vol. 223, No.2). July, 2004.

Presentations

Caviness, G. "Updates to Vapor Intrusion Guidance and Environmental Screening Levels", American Industrial Hygiene Association (AIHA) – Northern California Chapter (NCC). September 17, 2019.

Caviness, G. "Collision of Vapor Intrusion and Proposition 65", 2018 California Land Recycling Conference. Carson, California. October 24, 2018.

Caviness, G. "Confronting Risk Communication Challenges at Vapor Intrusion Sites", San Francisco Regional Water Quality Control Board. February 15, 2018.

Caviness, G. "The Vapor Intrusion Toolbox: Recent Developments in Investigation Methods and Risk Screening", California Unified Program Agencies (CUPA) Training Conference. San Diego, California. February 8, 2017.

Caviness, G. "Beyond Screening Levels: Tools to Refine Risk Evaluations". AEHS, West Coast Conference. San Diego, California. March 2016.

Caviness, G., L. Miesner, J. Louie, and M. Posson. "Impact of Applying Age Sensitivity Factors (ASFs) on Risk Characterization", AEHS Meeting, San Diego, CA. March, 2011.

Scofield R, Caviness G, Posson M. "Unique risk communication challenges posed by estimating human health risks for diesel exhaust". 2008 Annual Meeting, Air & Waste Management Association (AWMA), Portland, OR, June 2008.

Caviness, G. A., L. C. Hall, and S. P. Vonder Haar, "Variability and Uncertainty in Estimating Exposure", TIE poster presentation, Department of Energy Sixth National Technical Information Exchange (TIE) Workshop, Kennewick, Washington, May 17-19, 1994.

Hall, L.C., G. A. Caviness, and S. P. Vonder Haar, "Integrating Risk Assessment and Site Characterization", Presentation, Department of Energy Sixth National Technical Information Exchange (TIE) Workshop, Kennewick, Washington, May 17-19, 1994.

Project Experience

Site Risk Assessment

- Multi-Pathway Baseline Risk Assessment, Livermore, California. Performed a multi-pathway baseline risk assessment of a DOE Superfund site with air, surface, and groundwater contamination, as well as surface and subsurface soil contamination. The project included the development and application of criteria to select contaminants of concern; the development of site-specific exposure parameters; and acquisition and statistical analyses of data to discriminate between background and anthropogenic levels of metals and certain radionuclides in soil and groundwater.

- Human Health Risk Assessment, Comprehensive Long-Term Environmental Action Navy (CLEAN), California. Managed activities related to human health risk assessment for CERCLA sites under the CLEAN contract. Responsibilities included preparation of multi-pathway human health risk assessments for exposures to chemicals of potential concern (COPCs) in soil, sediments, surface water, and groundwater. Risk communication activities included negotiating with regulatory agencies (DTSC, EPA, City of San Francisco), collaborating with these agencies and public relations firms to develop risk communication materials and presenting risk assessment results to the public and other stakeholders.

- Human Health Risk Assessment, Technology Manufacturing Facility, California. Performed a risk assessment for a facility involved in the manufacture of high-technology products and regulated under RCRA. The purpose of this assessment was to demonstrate that risks to on- and off-site populations associated with exposures to polychlorinated biphenyls (PCBs), chlorinated solvents, and metals had been adequately mitigated through engineering controls and various remedial measures. Multiple approaches were applied for analyzing and reporting PCB concentrations including total PCBs, 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Equivalents, and Aroclors. Also, performed complex fate and transport modeling to assess risks associated with potential migration of PCBs in surface water and sediments to the San Francisco Bay. She presented the results of the risk assessment, which demonstrated that the PCBs at the Site did not pose a threat to human or ecological receptors, to regulatory agencies and other stakeholders.

- Risk Evaluation, Former Pesticide Mixing Facility, Hawaii. Managed and performed a risk assessment to evaluate potential exposures to dioxins/furans and pentachlorophenol (PCP). Hawai'i Department of Health (HDOH) Environmental Hazard Evaluation (EHE) Guidance and Environmental Action Levels (EALs) were used to guide data collection efforts and evaluation of the risks associated with potential exposure at the Site.

- Human Health Risk Assessments, Petroleum Company, California. Prepared a human health risk assessment to quantify risks associated with potential exposures to groundwater for a large petroleum company. The purpose of this assessment was to support recommendations for different remedial alternatives as presented in the facility corrective action plan.

Vapor Intrusion Evaluations

Managed and conducted risk assessments at numerous sites considering contaminant vapor intrusion into indoor air. Selected project experience highlighted below:

- Vapor Intrusion, Multiple Locations in California. Led vapor intrusion risk evaluations of multiple residences and commercial properties subject to oversight by County Health Agencies, the Department of Toxic Substances Control (DTSC) and State Water Quality Control Boards (RWQCB). Designed investigation, measurement, and sampling strategies, and evaluated sampling data to assess evidence for vapor intrusion; conducted a health risk assessment to quantify potential health effects of indoor air contaminants. Data collection efforts included VOCs in groundwater, soil gas, sub-slab,

and indoor/outdoor air. Successfully demonstrated to oversight agency that no significant health effects were attributable to vapor intrusion. These data and the results of vapor intrusion risk assessments were used to obtain No Further Action (NFA) determinations at numerous sites.

- Ongoing Vapor Intrusion and Risk Assessment Consulting, Confidential Client, San Mateo County, California. Technical advisor for all risk assessment aspects of management and redevelopment of property impacted with chlorinated solvents. Services include conducting vapor intrusion evaluations, designing and implementing indoor air quality assessments, interacting with regulatory agencies, and communicating assessment results and associated risks to building occupants, corporate executives and other stakeholders.
- Litigation Support, Former Petroleum Service Station, California. In support of litigation associated with a former service station site, conducted a risk assessment including evaluation of the potential risks posed by current and anticipated future conditions at the site, and by alternative remedial approaches for addressing free product, soils, and groundwater. Exposures evaluated include the potential for vapor migration into indoor and outdoor air. Indoor air data and local ambient air monitoring data were also used to assess the contribution of background and/or anthropogenic sources to levels measured in indoor air.
- Vapor Intrusion Evaluation, Residential Redevelopment, Ventura County, California. In support of a pending property transfer, conducted a vapor intrusion evaluation at a Brownfields site subject to oversight by DTSC. Residential units were planned for development upon completion of remediation at this large site. Extensive remediation had been conducted over two decades. However, residual chlorinated solvents including PCE, TCE, DCE, and vinyl chloride remained in fill materials and groundwater. Prepared a human health risk assessment to evaluate potential risks associated with the soil vapor intrusion pathway. Worked with counsel, other consultants, and agency reviewers to clarify and finalize in-progress reports and obtain approval for project documents. Communicated the findings of the evaluation to multiple parties, including regulatory agencies, property owner executives, and prospective purchasers.

Air Toxics Assessments

Managed and performed air toxics human health risk evaluations of emissions from multiple facilities in support of CEQA analyses and the California Air Toxics Hot Spots Program (AB-2588). Facilities evaluated include universities, airports, manufacturing facilities and mining operations. Selected project experience highlighted below:

- Health Effects Evaluation, Ports of Los Angeles and Long Beach, California. Evaluated health effects to residents and workers of diesel exhaust emissions from the combined ports to the surrounding communities.

- Human Health Effects Assessment, Port of Los Angeles, California. Led the human health effects assessment of fuel emissions for an intermodal rail project at the Port of Los Angeles, including the assessment of premature mortality and morbidity impacts on community health from particulate matter emitted from port operations; developed strategies to assess non-traditional public health endpoints associated with port operations.
- Health Risk Assessments, California. Peer-reviewer of health risk assessments of select rail yards in California conducted by the California Air Resources Board (ARB) as part of a Memorandum of Understanding (MOU) agreement between the railroads and ARB.
- Air Toxics Risk Evaluation, Stanford University, Palo Alto, California. Estimated the human health risks due to laboratory emissions from a proposed chemistry building at a California university for CEQA purposes. This work included the performance of screening steps to reduce the number of chemicals of potential concern (COPC) into a manageable number and the estimation of risks associated with potential exposures to facility emissions.
- Air Toxics Risk Evaluation, Bay Area Airport, California. Performed an air toxics human health risk assessment evaluation of emissions from a major Bay Area airport in support of a CEQA analysis. Assessed the health effects associated with emissions from all potential mobile source emission sources (such as aircraft and ground access vehicles).
- Air Toxics Risk Evaluation, Steel Foundry, California. Completed air toxics human health risk assessment under AB2588 for a steel foundry. The assessment addressed community exposures and off-site occupational exposures related to foundry emissions. Evaluated several scenarios aimed at effectively reducing emissions from the facility and risks to the neighboring community.
- Health Risk Assessment, Mining Facility, California. Developed and applied a potency-weighted emission screening methodology to select COPCs for evaluation in a risk assessment performed for a mining facility. This screening process included calculating emission rates for all chemicals listed on the facility baseline emission inventory, selecting toxicity criteria consistent with agency guidelines, developing a factor to evaluate multiple exposure pathways, and calculating an individual ranking score for each chemical according to its emission and potency. The objective of this screening process was to identify the chemical risk drivers for the facility and focus the assessment on those chemicals that contribute significantly to the overall risk.

Proposition 65/Product Evaluations

Performed numerous risk assessments under California's Proposition 65, including evaluation of consumer products and food, workplace exposures, and facility air emissions. Proposition 65 services included developing and implementing test protocols to evaluate chemical exposures associated with use

a wide variety of consumer products. Developed and critically evaluating No Significant Risk Levels (NSRLs) and Maximum Allowable Dose Levels (MADLs). Selected project experience highlighted below:

- Arsenic in Bottled Water: In support of negotiations with the Attorney General's (AG) office, provided scientific defense for use of a lifetime average daily dose of arsenic in bottled water rather than the single day exposure advocated by plaintiff.

- Formaldehyde in Clothing: For Proposition 65 compliance purposes, develop test protocols for total formaldehyde emissions testing and exposure simulation sampling of residual formaldehyde in shirts. Emissions testing involved use of Japanese Law 112 Method test (or equivalent ISO-14184-1 testing) in conformance with international regulations that limit formaldehyde levels in clothing in order to reduce the potential for allergic contact dermatitis particularly in sensitive individuals. The purpose of the exposure simulation developed for this project was to measure the total amount of formaldehyde available for inhalation by having a human subject wear a new shirt in a controlled environment for 8 hours while wearing a face-level sampling headset and personal air sampling device. Study results were compared to determine if compliance testing using ISO-14184-1 were predictive of exposures measured during the exposure simulation. Test results, including ambient levels in the study space, were considered in estimating inhalation exposures and comparison to Proposition 65 Safe Harbor levels.

- Acetaldehyde and Formaldehyde in Electronic Cigarettes. As the consulting expert on a Proposition 65 case, assessed potential exposures to acetaldehyde and formaldehyde by-products of electronic cigarettes. Reviewed and evaluated extensive "puff machine" data to assess exposures and developed estimates of dose below Safe Harbor levels.

- Acrylamide in Baked Goods: Developed testing protocols to evaluate levels of acrylamide in baked goods under various temperature and treatment conditions. The objective of these studies was to generate data for use in developing a strategy for reducing acrylamide levels in the product.

- Lead. Evaluated a wide range of foods and consumer products for lead exposures. Developed sampling protocols to evaluate Consumer Product Safety Commission (CPSC) compliance, as well as exposures to lead in consumer products, specifically addressing dermal contact and incidental ingestion associated with hand-to-mouth activities. For a food product, evaluated potential contribution of background lead levels.

- Bisphenol A (BPA): Performed Proposition 65 compliance evaluations on a number of consumer products to determine whether the amount of bisphenol A (BPA) in the polycarbonate components of the products would potentially result in an exposure to the average user that would exceed the Proposition 65 Safe Harbor Level. BPA evaluations involved product wipe testing to evaluate the presence, if any, of dislodgable BPA in the polycarbonate components, implementing product use simulation studies, hand wipe sampling, and developing exposure estimates based on a variety of use scenarios.

- Phthalates in Consumer Products: Provided consulting expert support on a litigation matter related to the exposure and human health risks associated with phthalate plasticizers used in soft plastic tool handle cushions.

- PFOA Exposure Evaluation. Evaluation of potential exposure to perfluorooctanoate (PFOA) from consumer products.