KEITH E. LEESE, REHS

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ENVIRONMENTAL SCIENTIST
Investigative / Environmental Chemistry & Microbiology / Environmental Health / Safety

Investigative Research ~ Study Design & Analysis ~ Field & Investigative Work ~ Methods Development
Environmental Sampling & Analysis ~ Sample & Data Collection & Organization ~ Laboratories ~ Clean Room
Project Management ~ Technology Skills ~ Problem-Solving ~ Marketing ~ R&D ~ Logistics & Quality Assurance

Versatile and dedicated professional with a proven track record of success in the environmental industry. Creative problem-solver who thrives on challenges and gets the job done. Diligent, analytical team player with a talent for cost reduction, quality improvement and creative solutions. Able to manage multiple projects simultaneously. Productive in both individual contributor and team environments. He has excellent communication skills.

Career Highlights:

- Coordinated field team in a large field study for NIOSH/CDC, on worker health and safety in the medical waste treatment industry.
- Led field team in a year-long EPA study to measure indoor chemical and biological contaminants in a normal multi-use building, which resulted in publishing numerous journal articles, being the lead author of one.
- Researched, finalized, and implemented methods to introduce and retrieve indicator microorganisms in alternative medical waste treatment systems in EPA studies on process efficacy and emissions.

EDUCATION /CERTIFICATIONS

BS, *School of Biological Life Sciences*, NORTH CAROLINA STATE UNIVERSITY, Raleigh, NC

Water Loss Restoration Certification, IICRC (2005 to present)
Registered Environmental Health Specialist / Registered Sanitarian (1997 to present)

PROFESSIONAL EXPERIENCE

LRC INDOOR TESTING & RESEARCH, Inc. Cary, NC 2007 – Current
Company performs industrial hygiene and environmental quality surveys, to include fungal and microbial contaminants.
SENIOR ENVIRONMENTAL SCIENTIST, VP AND SECRETARY

RESTORATION SCIENCES, LLC, Cary, NC 2004 – 2007
Recently dissolved company performed industrial hygiene and environmental quality surveys for commercial and industrial building owners, contractors, insurance companies, attorneys, realtors, homeowners and others in the eastern US.
SENIOR ENVIRONMENTAL SCIENTIST

Responsible for conducting industrial hygiene and environmental quality surveys to assist clients with assessment and remediation of mold contamination and other indoor environmental concerns. Perform field and laboratory assessments of commercial cleaning products and processes. Handle the whole process of client need assessment, cost proposal, performing and reporting the investigation, and creating an invoice.

- Performed method development, field work, and data collection on a cleaning study for Mike Berry.
- Provided mold remediation guidance for a construction contractor, using existing standards on a 13-floor hotel in West Palm Beach, FL after multiple hurricane strikes. Determined a procedure to systematically perform fungal clearance tests in a cost-effective way with respect to construction schedule.
- Performed industrial hygiene and airborne and surface fungal assessments at numerous commercial and residential sites.

- Performed method development and field tests for a novel fungal remediation process on building materials for a commercial client.

APPLIED ENVIRONMENTAL, INC, Cary, NC & Reston, VA 2002 – 2004
Company performs industrial hygiene and environmental quality surveys, primarily in NC, SC, and VA
SENIOR ENVIRONMENTAL SCIENTIST

Performed industrial hygiene and environmental quality surveys, and field and laboratory assessments of commercial cleaning products and processes.

- Assessed a 10-floor office building for indoor air quality and airborne and surface fungi before and after remediation.
- Performed industrial hygiene and airborne and surface fungal assessments at numerous commercial and residential sites.
- Assessed a cleaning product for the removal of dust and antigens from carpets for a commercial client. Antigens included dust mite (Der-p-1 and Der-f-1), roach (Bla-g-1), cat (Fel-d-1), dog (Can-f-1), and ragweed (Amb-a-1).

DYNCORP, Durham, NC 1997 – 2001
Health Research Services Division. DynCorp was a large government services corporation
ENVIRONMENTAL SCIENTIST

As a Project and Task Leader, performed field research, coordinating and implementing environmental field assessment to support government and industry projects relative to environmental and occupational health.

- Led studies involving indoor environmental quality parameters, such as bioaerosols, surface fungal amplification, biocontamination particles, VOC's, and other chemical and physical parameters.
- Coordinated a team to assess biological, chemical, physical hazards, and worker protection for a commercial alternative medical waste treatment facility.
- Managed a project for a study on VOC emissions from heated sewage sludge for a local government.
- Coordinated field activities for studies on residual fungal contamination in a flood-damaged building.
- Led field teams in a study to assess effects of a household disinfectant on mold and mildew on household surfaces for a commercial client.
- Led method development tasks to develop sampling and sampling and analysis procedures, using technical and mechanical background.
- Oversaw field sampling in a study, assessing the possibility of antibiotic cross resistance in household and skin bacteria from antibacterial and non-antibacterial cleaning products, in NC, NJ and England. Co-designed and performed a minimum inhibitory concentration laboratory testing on bacterial isolates.
- Co-authored a paper in the Journal of Environmental Microbiology on the *Investigation of Antibiotic and Antibacterial Agent Cross-resistance in Target Bacteria for Home of Antibacterial Product Users and Non-Users.*
- Researched and performed methods development to determine the best sampling strategies for a field study on the control of mold and mildew in the home environment.

RESEARCH TRIANGLE INSTITUTE, Research Triangle Park, NC 1980 – 1997
An international non-profit research organization for government and commercial clients
RESEARCH ENVIRONMENTAL SCIENTIST

Responsible for tracking project costs, supporting method development for environmental microbiological analysis, provide team leadership in EPA evaluations, provide field and laboratory support investigating potential odor sources and assist in planning and operation of an environmental microbiology research facility.

- Worked on the first method ever developed to assess worker exposures to blood and body fluid splashes when serving as Field Coordinator for a two-year NIOSH – funded field study, investigating and quantifying biological, chemical, and particulate exposures to medical waste treatment workers operating alternative treatment technologies at various US sites. Study results established guidance for health and safety of medical waste treatment workers everywhere.

- Coordinated a field team in a year-long EPA study on the measurement of physical, chemical, and microbial contaminants in a large building. This included the design and implementation of sampling methods and schedules, the collection and processing of samples, data reduction, and reporting. Results were published in abstracts and papers.
- Performed field work in EPA Superfund studies on potential treatments for PCB's and Dioxins in soils.
- Led project involving the acquisition and set up of a woodstove to measure the effects of burn rate, wood species, moisture content, and wood load on a number of emission components. This resulted in a publication for the EPA.
- Sampled process streams at coal and coke byproduct facilities and oil refineries.
- Began career as a research assistant in clean coal technology performing GC and TGA analysis in Chemical Engineering, and Process Research, and was promoted to positions of increased responsibility over the years, eventually becoming a Research Scientist due to excellent work performance, ethics and reliability.

AFFILIATIONS

National Environmental Health Association (Member 1994 to present)
Air and Waste Management Association (Member 1994-2000)

WORKSHOPS / SEMINARS

- AIHA Carolinas: Professional Development Course, Raleigh, NC., April 18-19, 2007.
- NC Energy Star Conference, Raleigh, NC., December 6, 2006
- AIHA ISO/IEC 17025:2005 Lab Accreditation Course, Chicago, IL., May 15, 2006.
- National Environmental Health Association 65th Annual Educational Conference and Exhibition. Atlanta, GA., June 28 – July 3, 2001.
- National Environmental Health Association 63rd Annual Educational Conference and Exhibition. Nashville, TN., July 6 – 9, 1999
- National Environmental Health Association 62nd Annual Educational Conference and Exhibition. Las Vegas, NV, June 27- July1, 1998.
- ACGIH 1998 Applied Workshop: Occupational & Environmental Exposure Assessment. Chapel Hill, NC. February 23-25, 1998.
- MidAtlantic Environmental Hygiene Resource Center: Cleaning and Restoration for a Healthy Indoor Environment. Raleigh, NC. October 9-10, 1997.
- National Environmental Health Association 61st Annual Educational Conference and Exhibition, Washington, DC. June 28 - July 2, 1997.
- International Symposium: Measurement of Toxic and Related Air Pollutants. By the USEPA and Air and Waste Management Association. Durham, NC. May**,** 1995.
- Measurement of Toxic and Related Air Pollutants. USEPA / Air and Waste Management Association International Symposium. Durham, NC., May 4-7, 1993
- International Symposium on Air Sampling Instrument Performance, Applications, Technology, Criteria, and Standards. Sponsored by ACGIH, NIOSH and the USEPA RTP, NC October 29-November 1, 1991.
- Bioaerosols: Health Effects, Exposure and Control. Sponsored by the ACGIH and University of Michigan, Ann Arbor Michigan, October 22-24, 1990.
- Bioremediation of Hazardous Sites Workshop. Sponsored by the USEPA, Philadelphia, PA. March 14-15, 1989
- Air Pollution Control Association 79th Annual Meeting. Minneapolis, MN. June 22-27, 1986.

PUBLICATIONS

Indoor Environment

Cole, E. C., R.M. Addison, J.R. Rubino, K.E. Leese, P.D. Dulaney, M.S. Newell, J. Wilkins, D.J. Gaber, T. Wineinger, and D.A. Criger. Investigation of Antibiotic and Antibacterial Agent Cross-resistance in Target Bacteria from Homes of Antibacterial Product Users and Non-users. Journal of Applied Microbiology, 95, 664-676, October, 2003.

Cole, E.C., P.D. Dulaney, and K.E. Leese. Allergen Control through Routine Cleaning of Pollutant Reservoirs in the Home Environment. Proceedings of Healthy Buildings 2000, Espoo, Finland, vol. 4, pp. 435-436.

Cole, E., C. Cook, P. Dulaney, K. Leese, M. Newell, M. Ahmed, L. Selman, H. Bowers, A. Corbett, and C. Cole. Characterization, Prevention, and Control of Mildew in Residential Environments: An Applied Research Study. In. E. Johanning, ed, Bioaerosols, Fungi, and Mycotoxins: Health Effects, Assessment, Prevention and Control, ENYO&EHC and Mt. Sinai School of Medicine, New York, 516-519.

Cole, E. C., C. E. Cook, P. D. Dulaney, K. E. Leese, M. S. Newel, M. U. Ahmed, L. Selman, A. L. Corbett, and C. J. Cole. Mold and Mildew in the Home Environment: Characterization and Control of Hard Surface Reservoirs. Proceedings of the 8th International Conference on Indoor Air Quality and Climate, vol. 2. pp. 513-517, Edinburgh, Scotland, August, 1999.

Cook, C. E., E. C. Cole, P. D. Dulaney, and K. E. Leese. Reservoirs of Opportunistic Fungi in the Home Environment: A Guide for Exposure Reduction in the Immunocompromised. Proceedings of the 8th International Conference on Indoor Air Quality and Climate, vol. 1, pp. 905-909, Edinburgh, Scotland, August, 1999.

Cook, C. E., E. Cole, P. Dulaney, K. Leese. Evaluation and Control of Opportunistic Fungal Sources in the Home Environment: A Guide for Exposure Reduction In the Immunocompromised. Presented at the Joint Conference of the International Society of Environmental Epidemiology/International Society of Exposure Analysis, Boston, MA, August, 1998.

Cole, E. C., C. Cook, P. Dulaney, K. Leese, L. Selman, M. Newell, M. Ahmed, H. Bowers, A. Corbett, and A. Delaney. Assessment of Mold & Mildew in the Home Environment: Allergen Control in a Residential Community. Presented at the Joint Conference of the International Society of Environmental Epidemiology/International Society of Exposure Analysis, Boston, MA, August, 1998.

Leese, K.E., E.C. Cole, R.M. Hall, and M.A. Berry. Measurement of Airborne and Floor Dusts in a Non-Problem Building. American Industrial Hygiene Association Journal; 58: 432-438 (1997).

Franke, D.L., E.C. Cole, K.E. Leese, K.K. Foarde, and M.A. Berry. Cleaning for Improved Indoor Air Quality: An Initial Assessment of Effectiveness. Indoor Air 1997; 7: 41-54.

Cole, E., P. Dulaney, K. Leese, K. Foarde, D. Franke, and M. Berry. 1996. Biopollutant Sampling and Analysis of Indoor Surface Dusts: Characterization of Potential Sources and Sinks. American Society for Testing and Materials STP 1287. Methods for Characterizing Indoor Sources and Sinks. ©Copyright 1996, pp.153-165.

Foarde, K.K., VanOsdell, D.W., Leese, K.E., Myers, E.A., and Dulaney, P.D., Field Moisture Measurement and Indoor Mold Growth. IAQ '96. October 6-8, 1996.

Leese, K.E., E.C. Cole, R.M. Hall, and M.A. Berry. 1995. Measurement of Airborne Particle Counts and Mass in a Healthy Building During a One-Year Cleaning Effectiveness Study. Proceedings of the USEPA/ Air and

Waste Management Association International Symposium: Measurement of Toxic and Related Air Pollutants. Durham, NC.

Leese, K.E., E.C. Cole, J.D. Neefus. 1994. Chlorine Dioxide Mitigation of a Mold Contaminated Building. Abstracts, American Industrial Hygiene Association Annual Conference and Exposition, p.15. Anaheim, CA.

Cole, E., K. Foarde, K. Leese, D. Green, D. Franke, and M. Berry. 1994. Assessment of Fungi in Carpeted Environments. In: Health Implications of Fungi in Indoor Environments, Air Quality Monographs, Vol.2. Elsevier, Amsterdam, pp. 103-128.

Cole, E., D. Franke, K. Leese, P. Dulaney, K. Foarde D. Green, R.M. Hall, and M. Berry, 1994. Indoor Environment Characterization of a Non-Problem Building: Assessment of Cleaning Effectiveness. RTI project 94U-4479-014, EPA Contract CR-815509-02-1, EPA/ECAO, Research Triangle Park, NC.

Leese, K.E., R.M. Hall, E.C. Cole, K.K. Foarde, and M.A. Berry. 1993. Use of a High-Volume Small Surface Sampler (HVS3) for the Microbiological Evaluation of Dust from Carpeted and Non-Carpeted Surfaces. In: Proceedings of the USEPA/Air and Waste Management Association International Symposium: Measurement of Toxic and Related Air Pollutants, pp.82-87. Durham, NC.

Cole, E. C., K. K. Foarde, K. E. Leese, D. L. Franke, and M. Berry. 1993. Biocontaminants in Carpeted Environments. In: Indoor Air '93 Proceedings, 4:351-356. Helsinki, Finland, July 4-9.

Cole, E. C., K. K. Foarde, K. E. Leese, D. A. Green, D. L. Franke, D. F. Naugle, and M. A. Berry. 1992. Indoor Air Quality Monitoring in Carpeted Environments. RTI project No. 94U-4479-005/04-F, final technical report; EPA contract No. CR-815509-01-0, EPA/ECAO, Research Triangle Park, NC.

Green, D. A., K. E. Leese, and E. C. Cole. 1992. Development and Evaluation of an Indoor Air Quality Test Kit. RTI project No. 94U-4479-005/03-F, final technical report; EPA contract No. CR-815509-01-0, EPA/ECAO, Research Triangle Park, NC.

Foarde, K. K., K. E. Leese, D. A. Green, and E. C. Cole. 1992. Initial Assessment of the IAQ Test Kit - A Residential Indoor Air Quality Investigation. RTI project No. 94U-4479-005/02-F, final technical report; EPA contract No. CR-815509-01-0, EPA/ECAO, Research Triangle Park, NC.

Leese, K. E., E. C. Cole, and J. D. Neefus. 1992. Biocide Mitigation of a Mold Contaminated Building: An Initial Preventive Approach. RTI commercial client, project No. 91C-5100, final technical report.

Cole, E.C., and K.E. Leese. 1991. Investigation of Bioaerosol Contamination in an Elementary School. Abstract, 119th American Public Health Association annual meeting. 1007, p.5.

Occupational / Industrial Hygiene / Process Evaluations

Leese, K. E., E. Cole. 2000. Volatile Organic Emissions from Heated Sludge in the Work Environment, Final Technical Report for the City of Durham, North Carolina.

Leese, K. E., E. Cole, P. Jensen. Assessment of Blood Splash Exposures of Medical Waste Treatment Workers. Journal of Environmental Health, vol. 61, no. 6, January/February, 1999.

Leese, Keith E., E. Cole, and P. Jensen. Assessment of Blood Splash Exposures to Workers in Medical Waste Treatment Facilities. Presented at the ACGIH 1998 Applied Workshop: Occupational & Environmental Exposure Assessment, February 1998, Chapel Hill, NC.

Cole, E. C., Owen, K., K. E. Leese, L. Hodson, R. Uhorchak, D. Greenwood, and D. VanOsdell. 1997. Control of Aerosol (Biological and Nonbiological) and Chemical Exposures and Safety Hazards in Medical Waste Treatment Facilities. Final Report for the National Institute of Occupational Safety and Health, Division of

Physical Sciences and Health Engineering Control Technology Branch. RTI project No. 93U-6449. Contract No. 200-95-2960.

Leese, Keith E., E. Cole, L. Hodson, D. VanOsdell, K. Foarde, and P. Jensen. Novel Techniques for Monitoring Potential Blood Exposures in Alternative Medical Waste Treatment Facilities. Presented at the 61st National Environmental Health Association Annual Educational Conference and Exhibition, June 28 - July 2, 1997 in Washington, D.C.

Bahner, Mark A, R. Wright, K. Leese, R. Geddes, and C. Nunez. Enclosures and Other Air Flow Management Techniques to Reduce the Size and Cost of Controls for the Fiber-Reinforced Plastics Industry. Presented at the Air and Waste Management Association Specialty Conference, "Emerging Solutions to VOC and Air Toxics Control", February 26-28, 1997 in San Diego, California.

Cole, E. E., K. E. Leese. 1994. Environmental Biopollutant Screening. Technical Report for Martin County, Florida.

Cole, E. C., K. E. Leese, and R. M. Hall. 1993. Evaluation of Potential Biological Emission from Alternative Medical Waste Treatment Technologies. RTI project No. 94U-5400-24, final technical report; EPA contract No. 68-WO-0032, U.S. Environmental Protection Agency/OSW, Washington, DC.

Cole, E.C., K.E. Leese, and R.M. Hall. 1992. Antimicrobial Effectiveness of Chlorine Dioxide in a Medical Waste Treatment System. Commercial client. RTI project No. 94C-5148.

Cole, E. C., T. K. Pierson, D. R. Greenwood, K. E. Leese, and K. M. Hendry. 1991. Evaluation of Medical Waste Treatment Technologies. RTI final technical report. EPA contract No. 68-WO-0032, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, DC.

Segall, R. R., K. M. Hendry, W. G. De Wees, G. C. Blanschan, K. E. Leese, L. G. Williams, F. Curtis, and R. T. Shigehara. 1991. Development and Evaluation of a Method to Determine Indicator Microorganisms in Air Emissions From Medical Waste Incinerators. *Journal of Air & Waste Management* Assoc., 41:1454-1460. Nov. 1991.

Hendry, K. M., C. W. Westbrook, C. Whitaker, L. G. Williams, K. E. Leese, Research Triangle Institute, RTP, NC, USA; Weerasinghe, C., C. Gombatz, R. Wang, SmithKline Beecham Animal Health, Westchester, PA, USA. 1990. Soil Biodegradation of Virginiamycin. Presented at the Society of Environmental Toxicology and Chemistry, 11th Annual Meeting, Arlington, VA, Nov. 11-15, 1990.

Leese, K. E., and S. M. Harkins. 1989. Effects of Burn Rate, Wood Species, Moisture Content and Weight of Wood Loaded on Woodstove Emissions. U.S. Environmental Protection Agency, EPA contract No. 600/2-89-025, May.

Leese, K. E. 1987. Applications of a Heated In-Situ APEG Treatment Process to Decontaminate PCB Contaminated Soil--A Case Study. Final Report for the U.S. Environmental Protection Agency, EPA Contract No. 68-02-3992, RTI 471U-3065-34.

Leese, K. E., and R. C. McCrillis. 1986. Integrated Air Cancer Project--Source Measurement. A Characterization of Woodstove Effluents. Paper No. 86-74-7. Presented at the 79th APCA Meeting in Minneapolis, MN, June 22-27.

Leese, K. E., and S. M. Harkins. 1985. Integrated Air Cancer Project--Source Measurement. Draft Final Report. EPA Contract No. 68-02-3992. RTI No. 3065-07. U.S. Environmental Protection Agency, Research Triangle Park, NC. September.

White, J. B., K. E. Leese, and A. C. Clayton. 1985. Interim Report on the Feasibility of Using U.V. Photolysis and APEG Reagent for Treatment of Dioxin-Contaminated Soils. EPA Contract No. 68-03-3149. RTI 472U-2500-47. U.S. Environmental Protection Agency, Cincinnati, Ohio, June.

White, J. B., C. M. Northeim, and K. E. Leese. 1985. Biological Production of Substitute Petroleum Fuels. EPA Contract No. 68-02-3170-96. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, March.

Process Sampling

Branscome, M., C. Allen, S. M. Harkins, K. E. Leese, and B. L. Blaney. 1987. Field Assessment of Steam Stripping Volatile Organics From Aqueous Waste Streams. In: Proceedings of the Symposium on Land Disposal, Remedial Action, Incineration, and Treatment of Hazardous Waste. U.S. EPA, Cincinnati, Ohio, May 6-8, 1987.

Allen, C., M. Branscome, C. Northeim, K. E. Leese, and S. M. Harkins. 1987. Case Studies of Hazardous Waste Treatment to Remove Volatile Organics. EPA Contract No. 68-02-3992-050, U.S. Environmental Protection Agency, Cincinnati, Ohio.

Branscome, M., S. Harkins, and K. Leese. 1986. Field Test and Evaluation of the Steam Stripping Process at Occidental Chemical, Belle, West Virginia, EPA Contract No. 68-03-3256, WA No. 1-6, for EPA Hazardous Waste Engineering Research Laboratory, Cincinnati, OH, December.

Branscome, M., K. E. Leese, and G. Howe. 1986. Field Test and Evaluation of the Steam Stripping Process at B. F. Goodrich, La Porte, Texas. EPA Contract No. 68-03-3253, WA No. 1-6; December 5.

Green, D. A., K. E. Leese, and W. J. McMichael. 1985. Mathematical Modeling of Emissions from Cooling Towers Using Coal Gasification Wastewater. U.S. Environmental Protection Agency. EPA/600/7-85-044; NTIS PB 86 118940. December.

Truesdale, R. S., J. G. Cleland, J. B. White, K. E. Leese, and K. L. Mack. 1984. Mathematical Modeling of Emissions from the Combustion of Wood and Alternative Fuels in a Residential Woodstove. NTIS PB85-105336.

Truesdale, R. S., K. Mack, J. B. White, K. E. Leese, and J. G. Cleland. 1984. Characterization of Emissions from the Combustion of Wood and Alternative Fuels in a Residential Woodstove. EPA-600/7-84-094. U.S. Environmental Protection Agency, Research Triangle Park, NC.

Green, D. A., K. E. Leese, K. L. Mack, and W. J. McMichael. 1983. Pollution Control in Coal Gasification. U.S. Department of Energy, DOE/MC/16441-1423. NTIS DE83-014550.

Green, D. A., K. E. Leese, and W. J. McMichael. 1983. Pollution Control in Coal Gasification. Testing of Zinc Ferrite Catalysts. U.S. Department of Energy, DOE/MC/16441-1406. NTIS DE83-010972.

Gangwal, S. K., W. J. McMichael, G. R. Friggins, and K. E. Leese. 1982. Vapor Phase Cracking of Coal Pyrolysates in Presence of Raw Gases From Coal Gasification. Presented at the Los Angeles AICHE Meeting, November 14-18, 1982.