

R. BRUCE BOWERS

Education

M.S.C.E – Environmental Engineering, West Virginia University, 1988

B.S.C.E – Civil Engineering, West Virginia University, 1986

Professional Licenses and Affiliations

Engineer Intern – West Virginia Board of Registration of Professional Engineers

Hazardous Waste Operations and Emergency Response (HAZWOPER)

Former Certified Hazardous Materials Manager (CHMM)

Former Certified Groundwater Professional (CGWP)

Professional Experience

Mr. Bowers is a project director and environmental engineer in the Environmental Services Practice for SCS offices in the mid-Atlantic region. He has a diverse background and broad geographic experience in project engineering and management, with emphasis on multimedia environmental regulatory compliance (CWA, CAA, RCRA Subtitle C and D, SARA Title III, OPPIA, SDWA and CERCLA), multimedia environmental permitting, hydrogeologic and subsurface investigations, quantitative human health risk assessment and hazardous materials and waste management.

Mr. Bowers' client base spans several major business sectors including: automotive (Harley-Davidson Motor Company), pharmaceutical (Boehringer Ingelheim Animal Health), aerospace (American Airlines M&E Base and B/E Aerospace), higher education (Missouri Western State University/Avila University), aluminum/magnesium diecasting (Spartan Light Metal Products), foundry/metal finishing/fabrication (Livers Bronze Company), injection/dip molding (Sinclair & Rush), fossil fuels (Missouri Gas Energy), membrane/fabrics (Parker Performance Materials) utility vehicle manufacturing (Dakota Bodies, LLC), medical diagnostics (Thermo Fisher Scientific) and residential/industrial cooling (Rheem Manufacturing/HTPG, LLC). In addition, Mr. Bowers' regulatory compliance experience geographically covers the states of VA, PA, MD, AR, AL, TX, MO, KS, MI, OH, WV and GA.

RCRA Subtitle C and D Experience

Mr. Bowers has 20 plus years' experience in the regulatory provisions of RCRA Subtitle C and D. He has managed non-hazardous (Subtitle D) and hazardous waste (Subtitle C) programs with budgets exceeding \$1M annually for Fortune 500 companies including Harley-Davidson Motor Company and Boehringer Ingelheim Animal Health.

His experience on the hazardous waste generator provisions of Subtitle C (Part 262) is extensive and includes: hazardous waste identification, waste determinations, container management and the air emission standards under Subparts BB and CC. In addition, he has assisted very small quantity generators (VSQGs), small quantity generators (SQGs) and large quantity generators (LQGs) of hazardous waste with the applicable provisions of the hazardous waste rules. This experience base includes manifesting, pre-transport requirements for labeling, marking and placarding of waste, preparing and conducting hazardous waste generator training, development and implementation of hazardous waste accumulation area inspections, biennial reporting, preparedness prevention (P&P) provisions and closure of hazardous waste central accumulation areas (CAAs). In terms of P&P

experience, he has prepared numerous written hazardous waste contingency plans for various manufacturing clients and business sectors.

Bowers also has experience with the treatment, storage and disposal facility (TSDF) owner/operator provisions of Subtitle C and D for solid non-hazardous waste landfill facilities (Part 258) and hazardous waste provisions (Part 265). This includes preparation of preparedness and prevention plans, emergency contingency plans, waste analysis plans and closure/post-closure care plans. In addition, Mr. Bowers held the role of groundwater statistician for the Solid Waste Division at the Virginia Department of Environmental Quality (VDEQ). He has 18 plus years' experience with the Part V groundwater monitoring provisions including detection, assessment, and corrective action groundwater statistical evaluations and response activities.

Subtitle D Landfill Groundwater Compliance

Frederick County Landfill, Winchester, VA. Prepared groundwater statistical evaluations for detection monitoring programs at active sanitary and CDD landfills and at the closed sanitary landfill. Prepared written groundwater sampling and analysis plans for active and closed landfills per VDEQ regulations.

Shenandoah County Landfill, Edinburg, VA. Prepared groundwater statistical evaluations for detection, assessment and corrective action monitoring programs in karst hydrogeology for sanitary landfill. In addition, prepared alternate source demonstrations (ASDs) for groundwater statistically significant increases (SSIs). Prepared written groundwater sampling and analysis plan for active sanitary landfill per VDEQ regulations.

Hanging Rock Landfill, Ironton, OH. Prepared groundwater statistical evaluations for first determination, detection, assessment and corrective action monitoring programs in fractured sandstone hydrogeology for closed sanitary and ash monofills. In addition, prepared alternate source demonstrations (ASDs) for groundwater statistically significant increases (SSIs) and written groundwater sampling and analysis plans for both facilities per OEPA regulations.

Marquette County Landfill, Marquette, MI. Prepared groundwater statistical evaluations for detection, assessment and corrective action monitoring programs in karst hydrogeology for sanitary landfill. In addition, prepared alternate source demonstrations (ASDs) for groundwater statistically significant increases (SSIs) per Michigan Department of Environment, Great Lakes and Energy (EGLE).

Environmental Regulatory Compliance Audits

Mr. Bowers is experienced in the performance of multimedia environmental compliance audits addressing regulations promulgated under RCRA, CERCLA, TSCA, CAA, SDWA, CWA, OPPA and EPCRA. A sample client list for multimedia compliance audits follows:

Rheem Manufacturing, Inc., Ft. Smith, AR. Manufacturing facility for industrial/commercial refrigeration/climate control systems.

Heat Transfer Products Group, LLC, Scottsboro, AL Subsidiary of Rheem Manufacturing. Manufacturing facility for industrial/commercial water heating/cooling systems.

Rheem Lewisville, Lewisville, TX. Major distribution shipping/receiving warehouse.

Thermo Fisher Scientific, Atlanta, GA. Medical diagnostics manufacturer.

American Airlines M&E Base, Kansas City, MO. Maintenance and engineering facility at Kansas City International (KCI) Airport.

Livers Bronze Company, Kansas City, MO. Commercial railing manufacturer (steel, brass, bronze and aluminum).

B/E Aerospace, Lenexa, KS. Aircraft parts and equipment manufacturer (seats, O2 systems, plug-and-play modules/equipment).

Kennametal, Rogers, AR. Manufacturer of carbide alloy cutting tools and tooling systems (tungsten carbide alloys).

Boehringer Ingelheim Animal Health, St. Joseph, MO. Internal multimedia audit of 2nd largest animal vaccine manufacturer in the world. Vaccines for companion pets, equine, bovine and other species.

Harley-Davidson Motor Company Operations, Multiple Sites. Internal multimedia audits at manufacturing sites for H-D motorcycles and accessories. Audits conducted on a regular basis at the Kansas City, MO assembly plant, York, PA assembly facility, Capitol Drive/Pilgrim Road (Milwaukee, WI) powertrain facilities and the Product Development Center (R&D).

Environmental Permitting

Mr. Bowers has prepared or evaluated applicability of multimedia environmental permit applications for federal and state environmental regulatory programs under CAA and CWA. A summary is below.

VPA Permitting-Land Application Feasibility Study

Bowman Apple Products, Inc.—Mt. Jackson, VA
Process Wastewater Land Application Feasibility Study

NPDES Permitting—Stormwater General Permits (GPs)/No-Exposure Certs (NOEC)

Heat Transfer Products Group, LLC—Scottsboro, AL
Distribution Warehouse
NOEC

Harley-Davidson Motor Company Operations—Kansas City, MO
Vehicle assembly/warehousing
GP/NOEC

Boehringer Ingelheim Animal Health—Saint Joseph, MO
Vaccine production/warehousing
GP/NOEC

Dakota Bodies, LLC—Liberty, MO
Vehicle assembly
GP

PTE Determinations/Air Emissions Permitting/Emissions Inventories

Missouri Gas Energy (MGE) Maintenance Facility—Kansas City, MO
Natural Gas Pipelines/metering
PTE/NSR permit

Harley-Davidson Motor Company Operations—Kansas City, MO
Powder paint, wet paint
PTE/Title V permit/NSR permit/MACT Hammer/air toxics (HAPs)/annual emissions inventories

Boehringer-Ingelheim Animal Health—St. Joseph, MO
Vaccine manufacturing
PTE/NSR permit/annual emission inventories

Boehringer-Ingelheim Animal Health—St. Joseph, MO
Research Farm—Medical Waste Incinerators (2)
PTE/NSR permit evaluations

Spartan Light Metal Products—Mexico, MO
Magnesium/Aluminum diecasting
PTE/emissions inventories

Livers Bronze Company—Kansas City, MO
Commercial railing systems
PTE determinations

Dakota Bodies, LLC—Liberty, MO
Utility truck body manufacturing/powder paint/wet paint/electrocoat
NSR permit

Wastewater Discharge Pretreatment Determinations/Permitting

Livers Bronze Company—Kansas City, MO
Phosphatizing (citric acid)
Part 433—Metal Finishing

Harley-Davidson Motor company—Kansas City, MO
Zinc Phosphatizing
Part 433—Metal Finishing

Boehringer Ingelheim Animal Health—St. Joseph, MO
Vaccine production-fermentation reactors
Part 439—Pharmaceutical Manufacturing

Adient (formerly Keiper Recaro)—Eldon, MO
Automotive seating manufacturer
Part 433—Metal Finishing

Environmental Management Systems (EMS)

Mr. Bowers has had significant training and exposure in the requirements and implementation of ISO 14001 and non-ISO environmental EMS's. A summary of his ISO 14001 and EMS experience follows:

- Trained as Internal ISO 14001 auditor—Harley-Davidson Motor Company
- Skilled at identification of environmental aspects and impacts with appropriate establishment of relevant targets and objectives.
- Assisted smaller manufacturing operations in establishment of basic EMS's using Microsoft Office tools.

Environmental, Social and Governance (ESG)/Sustainable Practices

With the advent of socially conscious investors and investor interest groups, evaluation of manufacturing entities from an environmental stewardship perspective rapidly evolved in the US. Environmental, social, and governance (ESG) criteria have become an increasingly popular way for investors to evaluate companies in which they might want to invest. Investment applications of ESG criteria included many mutual funds and brokerage firms. The ESG approach has also been used to help investors avoid companies that might pose a greater financial risk due to their environmental or other practices. Aside from the environmental aspects which are relatively well established through regulation, the social aspect includes the Company's relationship with employees, suppliers, customers, and the community where it operates. The governance aspect ties in a Company's leadership, executive pay, audits, internal controls and shareholder rights. Together, this framework is termed ESG. This is sometimes referred to as sustainable investing or socially responsible investing.

Bowers also has experience with the Cradle-to-Cradle® Certified Product Standard. The Cradle-to-Cradle® (C2C) standard is a globally recognized standard of safer, more sustainable products made for the circular economy framework. It includes an evaluation of five major pillars: material health, material reutilization, renewable energy and carbon management, water stewardship and social fairness. Many major manufacturer in the US now subscribe to the C2C framework including but not limited to: L'Oréal, Shaw, Herman Miller, and Unilever.

Bowers has been significantly involved in assisting with the environmental and regulatory aspects of large manufacturing entities for their ESG programs (Harley-Davidson Motor Company and Boehringer Ingelheim Animal Health). A summary of his experience is below:

- **Harley-Davidson (H-D) Motor Company Operations, Kansas City, MO, EEBN.** Under the auspices of Bridging the Gap (BTG) a 503(c), not-for-profit entity in Kansas City, MO, Bowers, then at H-D was a founding member of the Environmental Excellence Business Network (EEBN). The EEBN was formed to promote sustainable business practices in the manufacturing sector and included the following founding members: H-D, Sprint, Boulevard Brewing, Bayer, Hallmark Cards, and Kansas City Power and Light (KCPL), among others. The EEBN was later re-branded as the Green Business Network (GBN). The EEBN/GBN has held monthly tours of metropolitan area manufacturers to promote education and share successes around sustainability and sustainable practices.

- **Harley-Davidson (H-D) Motor Company Operations, Kansas City, MO, Regional Byproduct Synergy (BPS) Initiative.** Under the auspices of Bridging the Gap (BTG) a 503(c), not-for-profit entity in Kansas City, MO, Bowers, then at H-D was a founding member of the Environmental Excellence Business Network (EEBN). The EEBN was formed to promote sustainable business practices in the manufacturing sector and included the following founding members: H-D, Sprint, Boulevard Brewing, Bayer, Hallmark Cards, and Kansas City Power and Light (KCPL), among others. The EEBN was later re-branded as the Green Business Network (GBN). The EEBN/GBN has held monthly tours of metropolitan area manufacturers to promote education and share successes around sustainability and sustainable practices.
- **Boehringer Ingelheim Animal Health (BIAH), Saint Joseph, MO, Be Green Initiative.** Worked with the local vaccine plant staff to develop a sustainability framework and initiative at the manufacturing plant level.

Industrial Hygiene (IH) and Indoor Air Quality (IAQ)

Mr. Bowers has coordinated and overseen third-party IH and IAQ services for chemical and biological constituents at various manufacturing settings and facilities. Constituents of concern have included: i) benzene, ii) hexavalent chromium, iii) PM/dust, iv) mold spores, v) TVOCs and vi) THAPs. Based upon results of IH/IAQ measured concentrations, prepared written reports recommending various administrative controls, engineering controls or applicable PPE.

Hospital, Medical, Infectious Waste Incinerators (HMIWI) Compliance

Mr. Bowers has prepared written HMIWI waste management and acceptance procedures for medical waste incinerators at vaccine manufacturing facilities. In addition, he has prepared SOPs for the management of commingled infectious and RCRA characteristic waste. Bowers has also prepared written blood-borne pathogen programs.

Quantitative/Qualitative Human Health Risk Assessments (HHRAs)

Bowers has prepared quantitative human health risk assessments (HHRAs) for UST sites, brownfield sites, manufactured gas plant (MGP) sites, former orchards and landfills. These HHRAs were performed using the EPA's Risk Assessment Guidance for Superfund (RAGS) Part A and B. In this area, Bowers performed exposure and toxicity assessments, risk evaluations and developed conceptual site models (CSMs for complex sites with multimedia contamination.

Petroleum

Mr. Bowers has experience in the environmental aspects of petroleum management, release investigation, and remediation. He has prepared Spill Prevention, Control and Countermeasures Plans, Oil Discharge Contingency Plans (Virginia), and Integrated Contingency Plans (ICPs). Permitting experience for petroleum facilities includes UST/AST registrations, preparation of stormwater permit applications, stormwater management plans, air emissions permit applications, and annual air emissions inventories.

Design and inspection experience includes UST systems, AST systems, and secondary containment systems. Secondary containment experience also includes inspections, capacity evaluations, and upgrades.

His petroleum remediation experience includes soil and groundwater. Soil remediation experience includes excavation, in-situ bioremediation, thermal desorption, soil vapor extraction, stabilization,

and cover systems. Groundwater remediation experience includes free product removal systems, air stripping, and carbon adsorption systems.

Environmental Manager

Prior to joining SCS in 2021 Bowers spent 15 years as the Environmental Compliance Manager at Harley-Davidson's Vehicle Assembly and Powertrain Operations in Kansas City, MO. During this time, Bowers was responsible for H-D's multimedia environmental compliance programs under the CWA, CAA, EPCRA, RCRA and CERCLA. This included all air and water/wastewater permitting (H-D was a Title V air source), as well as the preparation of annual emissions inventories and potential-to-emit (PTE) determinations. Under the CWA, Bowers was responsible for management and reporting of stormwater and wastewater pretreatment, SPCC compliance, preparation of sampling and analysis plans, SWP3, and regular compliance inspections. Bowers also prepared accidental slug discharge contingency (ASDC) plans and toxic organic pollutant management (TOPM) plans for wastewater compliance. He was responsible for all of H-Ds annual reporting under Tier II and Form R for EPCRA. In addition, he oversaw solid and hazardous waste management at the facility and included hazardous waste reporting and training under the provisions of RCRA. This included preparation of large quantity generator (LQG) hazardous waste contingency plans and LQG hazardous waste awareness training.

Publications and Presentations

R.B. Bowers, **Wastewater Pretreatment Issues in the Metal Finishing Industry**, Pretreatment Forum, U.S. EPA Region VII, Kansas City, Kansas, August 12, 1999.

R.B. Bowers, **The MULTIMEDIA Exposure Model as a Risk Assessment Tool at LUST Sites**, Federal Environmental Restoration III & Waste Minimization II Conference and Exposition, New Orleans, LA. April 1994.

R.B. Bowers, **The MULTIMEDIA Exposure Model as a Risk Assessment Tool at LUST Sites**, Environment Virginia Symposium, Lexington, VA. April 1994.

R.B. Bowers, D.D. Gray, **A Computer Program for Two-Phase Pipe Flow Analysis**, Seventh National Conference on Microcomputers in Civil Engineering, Orlando, Florida, November, 1989.

Bowders, J.J., Bowers, R.B., **Tracking Potentially Hazardous Materials in the Hand Glass Industry**, Society of Glass Practices, Morgantown, West Virginia, May 1989.

Bowers, R.B., Gray, D.D., **Design and Operation of a Vacuum Transport Test Facility**, David Taylor Research Center, Report DTRC/SME-CR-13-88, May 1988, 160 pages.

Gray, D.D., Bowers, R.B., Burns, F., Rodriguez, A.T., **Experimental Study of Flow in a Vacuum Sewer**, Engineering Mechanics - 7th Conference, American Society of Civil Engineers, Blacksburg, Virginia. May 1988.

Gray, D.D., Bowers, R.B., **Design and Performance of a Vacuum Sewer Flow Experiment**, Engineering Mechanics - 6th Conference, American Society of Civil Engineers, Buffalo, New York. 1987.

Gray, D.D., Miller, C.R., Bowers, R.B., **Shipboard Vacuum Transport Test Procedure and Test Rig Design**, David Taylor Naval Ship Research and Development Center. Report DTNSRDC/SME-CR-06-86. March 1986. 81 pages.