



**Michael Stevens**  
**Office Manager and Biomedical Engineer**

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**Academic and Professional Profile**

Michael Stevens is a consultant with Paustenbach and Associates, focused on toxicology, risk assessment, occupational health, environmental engineering, and product stewardship. His current interest is airborne and ingested chemicals, and he has previously worked with soil contaminants under the guidance of Dr. Dennis Paustenbach. Michael is also a project manager and the office manager for the firm’s Jackson Hole, Wyoming location, focusing on budgets, deadlines, workload analysis, work product quality, and staff training. With a B.S. in Biomedical Engineering and a minor in Chemistry from Rose-Hulman Institute of Technology, Michael uses his engineering background and technical knowledge to analyze data and problem solve effectively.

**Education and Degrees Earned**

- Bachelor of Science in Biomedical Engineering and Minor in Chemistry (completed Pre-Medicine requirements), Rose-Hulman Institute of Technology, 2022

**Experience Summary (Professional Career)**

**Paustenbach and Associates**  
**Biomedical Engineer & Office Manager - Jackson Hole, Wyoming**  
**July 2022 – Present**

- Consultant in toxicology, risk assessment, occupational health, environmental engineering, litigation work, and product stewardship.
- Involved in conducting exposure assessments, interpreting toxicological studies, assessing mathematical models, characterizing risks posed by chemicals, fibers, and radionuclides.
- Experienced with novel air sampling, conducting simulation studies, dispersion modeling, dose-reconstructions, data analysis, setting OELs, training industry employees, and engineering design.
- Offered support on numerous cases in the areas of food & beverage, water treatment, pharmaceuticals, PPE, E-cigarettes, asbestos-containing products.
- Serves as project manager for many large project involving occupational, environmental, and end-user exposures to potential hazards in the following industries: wastewater treatment, chemical manufacturing, steel manufacturing, automobiles, and construction.
- As office manager for Jackson, WY, Michael manages budgets, deadlines, and workload distribution in the office. He also oversees work product quality and new hire training.

**Rose-Hulman Biomechanics Laboratory**  
**Researcher**  
**Terre Haute, Indiana**  
**Summer 2021**

- Researched carpal tunnel syndrome and wrist and thumb movement biomechanics.
- Designed and performed several testing procedures to determine the material properties of wrist and thumb splints made of 12 different thermoset plastic materials using various application techniques described by occupational therapists.
- Developed Instron fixtures and Bluehill Universal programming.
- Analyzed the collected stiffness and hysteresis data.
- Supervised by Dr. Renee Rogge and intended to be published.

**Paragon Medical**  
**Biomedical Engineering Intern**  
**Pierceton, Indiana**  
**Spring Co-op 2020**

- Designed, modeled, created drawings, and performed quality testing on fixtures that were used in the manufacturing of orthopedic medical devices and implants.
- These fixtures held the devices in place while allowing lathe, EDM, CMM, and other machines to function properly and within the smallest tolerance possible.
- Used Siemens NX CAD modeling software to do this and both 1994 and 2009 GD&T standards depending on the client.

**Union Hospital Bone and Joint Center**  
**Shadowed Orthopedist Dr Carlos Belmar**  
**Terre Haute, Indiana**  
**January 2020**

- Shadowed the assessment and treatment of patients.
- Observed steroid injections.
- Interpreted MRIs, CAT scans, and X-rays in knees and hips for patients of all ages.

## **Key Projects (Partial List)**

1. **Assessment of occupational and non-occupational asbestos exposures and the potential for such exposures to yield health effects.** Various claims associated with exposure to allegedly asbestos-containing products including insulation, transite, gaskets, packing, clutches, brakes, duct sealant, and electrical components, among other materials. In addition to end-product users, the various industries in which occupational exposures were assessed includes asbestos product manufacturing, steel manufacturing, automobile manufacturing and repair shops, construction, shipbuilders and shipyard, chemical manufacturers, and others. Assisted with exposure assessment based on historical industrial hygiene records to examine the potential for either a given product(s) or given occupations to yield health effects at exposure levels likely experienced by direct and/or bystander exposed persons (2022-2024).
2. **Assessment of occupational exposures to various chemicals and bioaerosols in wastewater treatment facilities and the potential for such exposures to yield health effects.** Addressed claims associated with exposure to various chemicals and biohazards. Assisted with hazard identification and exposure assessment to examine the potential of the occupational environment to yield health effects at exposure levels likely experienced by a wastewater treatment worker during various activities (2022).
3. **Investigated the current scientific understanding of atypical Hemolytic Uremic Syndrome.** Reviewed and summarized the literature regarding the progression of the disease, the relevant genetic factors, and the mechanisms in which aHUS episodes are triggered (2022).
4. **Assessment of occupational exposures at chemical manufacturing facilities and the potential for such exposures to yield health effects.** Addressed exposure claims amongst various employees at a chemical plant. Assisted with hazard identification, exposure assessment, and dose-response assessment to examine the potential of various processes to yield health effects at plausible exposure levels experienced by employees (2023).
5. **Assessment of potential chemical exposures amongst consumers of a food/beverage product.** Addressed exposure claims amongst end-product consumers. Assisted with analysis of the manufacturing and packaging process, hazard identification, exposure assessment, and dose-response modeling to examine the potential of contamination and contaminated products to yield health effects on consumers (2023). Derived acceptable daily intakes (ADIs) for adverse liver endpoints based on animal data (2023-2024).
6. **Assessment of product contamination as a result of a chemical combustion event(s).** Assisted with hazard identification and dispersion modeling of a large combustion event. In wake of the event, suggested a timely action plan for potentially contaminated food grade products (2023).
7. **Assessment of silica exposures and the potential for such exposures to yield health effects.** Addressed claims associated with bystander exposures to allegedly silica-containing construction products. Assisted with exposure assessment to examine the potential for a given product to yield health effects at exposure levels likely experienced by direct and/or bystanders persons (2023-2024).

8. **Assessment of PPE products and their effectiveness against various hazards in various industries.** PPE products, including respirators, were assessed for their effectiveness and limitations in protecting employees from various hazards. The claim was that they often did not provide a protection factor of 5 or 10 and, as a result, did not always adequately protect persons (2022).
9. **Assessment of remediation efforts and potential radionuclide exposures at a former Naval site.** Reviewed all the available information and assembled a scope of work to conduct a sensitivity analysis and risk assessment based on historic and current soil samples at the site (2022).
10. **Assessment of occupational hazards in tire manufacturing facilities and the potential for such exposures to yield health effects.** Addressed exposure claims amongst tire manufacturing employees. Assisted with hazard identification, exposure assessment, epidemiology interpretation, and dose-response relationships to assess the potential of various processes to yield health effects at plausible exposure levels experienced by employees (2023).
11. **Assessment of the state-of-the art scientific information regarding PFAS/PFOA exposure and the potential for such exposures to yield health effects.** Identifying published and unpublished no adverse effect levels (NOAELs) and lowest adverse effect levels (LOAELs) for various adverse endpoints based on animal data. Reviewed the derivations of safe dose levels in humans (2023-2024).
12. **Assessment of industrial talc exposures and the potential for such exposures to yield health effects.** Assisted with the exposure assessment of allegedly exposed persons in the workplace. Assessed the ability for talc to yield the alleged health effects at plausible exposure levels (2022-2023).
13. **Derivation of acceptable daily oral intakes of hydrazine in humans based on animal data.** Collected NOAEL and LOAEL doses from numerous animal studies and used that data to recommend an orally ingested hydrazine ADI in humans (2023-2024).
14. **Research into the industry standards for PVC and PVC end products.** Reviewed corporate documents, conducted a literature review, and interviewed materials experts on various aspects of PVC processing (2024).
15. **Investigated the current scientific understanding of pleural plaques.** Reviewed and summarized the literature on the causes and progression of pleural plaques and pleural thickening investigated potential associations with various occupations (2024).
16. **Investigated the current scientific understanding of renal cell carcinomas.** Reviewed and summarized the literature on risk factors (derived from animal studies and epidemiological research) and genetic mutations that contribute to the development of clear cell and papillary renal cell carcinomas (2024).

17. **Researched airborne fiber transport and analyzed the effects of fiber type and debris binding on fiber dispersion.** Reviewed and summarized the relevant literature on fiber and particle dynamics. Interpreted fiber deposition data from a simulation study involving the suspension of particles during cement pipe cutting activities. Compared the deposition patterns of cement-bound and free fibers as well as the impact that fiber type (crocidolite and chrysotile fibers) on the likelihood of debris binding (2023-2024).

## **Peer Reviewed Publications (Chapters and Papers)**

### **Occupational Exposure to Asbestos in the Steel Industry (1972–2006)**

Dennis J. Paustenbach, **Michael E. Stevens**, Brett P. Tuttle, Ross A. Shore, Sabina Ligas & David W. Brew  
*Published in the Journal of Exposure Science & Environmental Epidemiology (2023)*

This paper presents all the known personal air sampling data for airborne asbestos for the facilities of the U.S. Steel Corporation in America for the period 1972-2006; about 34 years. It represents among the most complete industrial hygiene data sets to be shared by any corporation in a scientific journal. One of the benefits of presenting these data is that it also provides insight into where asbestos containing materials were used in steel making. We discuss all the uses of asbestos-containing materials (ACM) in the steel industry and various opportunities for exposure in this paper.

### **Occupational Exposures to Asbestos in the Steel Industry: An Analysis of the AISI Sampling Campaign (1989-1997)**

**Michael E. Stevens**, David W. Brew, & Dennis J. Paustenbach  
*Published in the Journal of Occupational & Environmental Hygiene (2024)*

This paper analyzes samples from five different steel manufacturers: Georgetown Steel Company, Inland Steel Company, Ling-Temco-Vought (LTV) Corporation, United States Steel Corporation, and Weirton Steel Corporation. Overall, the data indicated that the airborne concentrations were quite low in 1989 and they continued to be low through the study period which ended in 1997. Consistent with prior data, analysis of this dataset supports the view that materials containing asbestos were not used in many applications in the steel industry and the airborne concentrations of asbestos were virtually always below the occupational exposure limits (OELs) in the post-OSHA era (1972-2000).

### **Silica and Silica Compounds Book Chapter**

Antonella Marrocco, Alane B. C. Dy, Thomas J. Slavin, Scott Dotson, **Michael E. Stevens**, David W. Brew, & Luis A. Ortiz

*Published in Patty's Industrial Hygiene and Toxicology 7<sup>th</sup> Edition (2023)*

This chapter presents a state-of-the-art review on silica (silicon dioxide in both its crystalline and non-crystalline, or amorphous form) and several of the more significant silicates (silica-containing minerals). It provides the necessary background, defines terminology, explains the use and exposures to various forms of silica and silica compounds, and explains the hazards.

### **Dose Reconstructions for Radionuclides: Case Study Involving Hunters Point Naval Shipyard (HPNS), California**

David Brew, Ayla Pavelka, Jack Buddenbaum, **Michael E. Stevens**, Dennis Paustenbach, & Robert D. Gibbons  
*Published in The Risk Assessment of Environmental Hazards (A Textbook of Case Studies) (2023)*

This chapter presents a risk assessment, conducted in accordance with federal guidelines, represents the first comprehensive evaluation of past, present, and future health risks associated with radionuclides present at Hunters Point Naval Shipyard in San Francisco, California. This site was deemed a Superfund site by the USEPA in 1989 due to chemical and radiological contamination resulting from U.S. Navy operations from 1939 to 1974. During characterization and remediation efforts, over 50,000 radiological soil samples and 19,000 air samples were collected. Risk estimates for all scenarios were found to be significantly below the acceptable risk of  $3 \times 10^{-4}$  approved by regulatory agencies.

## **The presence of erionite in North American soils and the estimated mesothelioma potency by region**

**M. E. Stevens**, D. J. Paustenbach, N. J. Lockhart, D. E. Busboom, B. M. Deckard, and D. W. Brew

*Published in Inhalation Toxicology (2024)*

This paper predicts the potency of North American erionite fibers. Based on the model from Korchevskiy et al. (2019) and the available published information on erionite, the estimated mesothelioma potency factors (the proportion of mesothelioma mortality per unit cumulative exposure (f/cc-year)) for erionites in the western United States range from 0.19 to 11.25 (average ~3.5), depending on the region (for reference, crocidolite is assigned a potency factor ~0.5). Known for its potency for causing mesothelioma in the Cappadocia region of Turkey, the model predicted potency of Turkish erionite (4.53) falls in this range of potencies. Although it can vary by region, a reasonable ratio of average mesothelioma potency based on this model is 3,000:500:100:1 comparing North American erionite, crocidolite, amosite, and chrysotile (from most potent to least potent).

### **Published Abstracts:**

#### **An evaluation of trends for mesothelioma mortality in women: Addressing the content of a recent Morbidity and Mortality Weekly Report (MMWR):**

*B. P. Tuttle, M. E. Stevens, R. A. Shore, D. W. Brew, and D. J. Paustenbach*

Published in *The Toxicologist* (2024)

#### **The presence of erionite in North American soils and the estimated mesothelioma potency by region:**

*M. E. Stevens, D. J. Paustenbach, N. J. Lockhart, D. E. Busboom, B. M. Deckard, and D. W. Brew*

Published in *The Toxicologist* (2024)

#### **Proposed occupational exposure limits (OELs) for various asbestos mineral types based on updated mesothelioma dose-response data:**

*D. J. Paustenbach, M. E. Stevens, D. W. Brew, and A. Korchevskiy*

Published in *The Toxicologist* (2024)

#### **Occupational Exposures to Asbestos in the Steel Industry: An Analysis of the AISI Sampling Campaign (1989-1997)**

*M. E. Stevens, D. W. Brew, & D. J. Paustenbach*

Published in *The Toxicologist* (2024)

#### **Proposed Acceptable Daily Intake (ADI or AI) for Humans for Chronic Oral Exposures to Hydrazine**

*D. J. Paustenbach, M. Hilsabeck, M. E. Stevens, B. M. Deckard, & D. W. Brew*

Published in *The Toxicologist* (2024)

**Presentations at Scientific Conferences**

***November 15<sup>th</sup>, 2023, DRI Asbestos Medicine Seminar:***

**Fallacies Regarding the Science of Plaintiff's Cases Involving Mesothelioma in Women  
(allegedly due to asbestos exposure)**

Dennis Paustenbach, David Brew, and **Michael Stevens**

***March 10<sup>th</sup>-14<sup>th</sup>, 2024, Society of Toxicology (SOT) Conference:***

**Presented posters in the Human Exposure Assessment/Biomonitoring; Epidemiology and  
Public Health; Air Pollution Toxicology; Risk Assessment; and Late-Breaking sections  
during the ToxExpo event**

**Michael Stevens**



## **Professional Honors and Awards**

- 2024 International Best Researcher Award- Asia's Science, Technology & Research Awards
- Samuel F. Hulbert Most Outstanding Graduate in Biomedical Engineering
- Deans List, Rose-Hulman Institute of Technology, 2018-2022
- Moench Commendation faculty selected nominee for exemplary character
- John T. Royse Award faculty selected nominee based on academic achievement, student leadership, participation in extra-curricular activities, and citizenship
- Rose Show Biomedical Engineering Department Award for outstanding design project
- Barry Goldwater Scholarship Nominee (1/4 Rose-Hulman students nominated in 2021)
- Rose-Hulman's nominee for the DIII Commissioner's Association student-athlete of the year award
- Varsity R Club Award for Male Athlete with the Most Outstanding Senior Year
- Football Team Captain, Conference DPOY, Team MVP, All-American, 3X Academic All-Conference, 4X Varsity letter, Conference Champion
- Phi Gamma Delta 1848 Club Outstanding Brother Award

## **Membership to Professional Societies**

- Society of Toxicology (SOT)
  - Associate Member; 2023 and 2024 conference attendee
  - Served as the Human Health Exposure Poster Session Chair at the 2024 ToxExpo
  - Member of the following Specialty Sections:
    - *Biological Modeling*
    - *Carcinogenesis*
    - *Exposure*
    - *Inhalation and Respiratory*
    - *Medical Device and Combination Product*
    - *Occupational & Public Health*
    - *Regulatory & Safety Evaluation*
    - *Risk Assessment*