**Curriculum Vitae**

# Mitchell R. Olson, PE, PhD

**Research Associate Professor**
**Colorado State University**
**Department of Civil and Environmental Engineering**
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## Qualifications Summary

- 24 years of work experience including consulting and academic/laboratory research
- Program leadership including development, implementation, training, and management
- Demonstrated PFAS and emerging contaminant expertise via program development, project support, technical presentations, trainer, author, and participation in professional groups
- Demonstrated expertise in environmental chemistry and remediation, with a focus on natural degradation processes for hydrocarbons and chlorinated solvents
- Accomplished in technical writing, peer review/editing, and technical presentations
- Experienced with personnel and project management
- Led and/or coordinated with teams of technical experts including academia, consulting, and industry

## Professional Experience Summary

***Colorado State University, Fort Collins, Colorado*** ..... 2024 to present
Research Associate Professor

***Trihydro Corporation, Fort Collins, Colorado*** ..... 2015 to 2024
Senior Engineer, Emerging Contaminants Director

***Colorado State University, Fort Collins, Colorado*** ..... 2003 to 2015
Research Scientist / Research Associate / Graduate Research Assistant

***Conestoga-Rovers & Associates, St. Paul, Minnesota*** ..... 2000 to 2003
Project Engineer

## Education

**PhD in Civil and Environmental Engineering** ..... 2014
Colorado State University, Fort Collins, Colorado

**M.S. in Civil and Environmental Engineering** ..... 2005
Colorado State University, Fort Collins, Colorado

**B.S. in Chemical Engineering** ..... 1999
University of Minnesota Duluth, Duluth, Minnesota

## Professional Experience

*Colorado State University (2024-present)*

**Research Associate Professor (2022-2024)**

- Serving as co-director for the Center for Contaminant Hydrology
- Supporting the University Consortium for Field-Focused Groundwater Contamination Research
- Collaborating with industrial sponsors
- Developing and enhancing solutions for sites impacted with petroleum hydrocarbons, including natural source zone depletion (NSZD)
- Supporting new research associated with PFAS and other emerging contaminants

*Trihydro (2015-2024)*

**Emerging Contaminant Director (2022-2024)**

- Led proposal efforts involving PFAS and emerging contaminants
- Provided technical advisement on emerging contaminant projects including work plan development, site characterization strategy, sampling, conceptual site models (CSMs), and remediation
- Coordinated PFAS standard operating procedure development and sampling training
- Coordinated monthly PFAS working group meetings and vendor presentations/discussions
- Supported business development meetings with clients via PFAS presentations and discussion
- Authored/reviewed PFAS-related articles for company distribution via social media
- Presented webinars and at technical conferences
- Identified and pursuing industry/government PFAS project opportunities
- Kept current through participation in several professional groups (listed below) and research

**Select Project Experience (2015-2024)**

- FE Warren Air Force Base (2023-2024): Serving as Trihydro's project manager and technical lead on an AFCEC-funded project (BAA2217; led by Arclight) involving porewater sampling via lysimeters to test/validate a HYDRUS model modified for PFAS in the vadose zone.
- Solano County, California (2023-2024): Serving as technical lead in project involving soil and porewater sampling to evaluate PFAS impacts in agricultural fields with land-applied biosolids. Supporting client in public meetings.
- Larimer County Landfill (2021-2024): Supporting permit-required seep sampling, including training of sampling personnel for PFAS sampling. Previously, my project role included design and implementation of a data collection program evaluating monitored natural attenuation (MNA) for chlorinated solvents and 1,4-dioxane.
- Pantex Plant (2015-2024): Providing bioremediation expertise and engineering support for one of the world's largest *in situ* bioremediation systems, located at the U.S. Department of Energy's Pantex Plant in Amarillo, TX; the project involves molasses injection in over 150 wells in an aquifer at 300-foot depth for treatment of chlorinated solvents, high explosives, perchlorate, and hexavalent chromium.
- Industrial Client (confidential), California (2023-2024): Leading evaluation of PFAS treatment options for wastewater streams, including development of a table for comparing treatment options. Coordinating discussions with foam fractionation vendors.

- ESTCP (2015-2017): Served as Principal Investigator for a Department of Defense, ESTCP-funded project (ER-201587) involving cryogenic coring for remediation performance assessment of a chlorinated solvent source-zone remediated via soil-mixing with zero-valent iron (ZVI).
- Multiple Oil and Gas Clients (2015-present): Designed and supported implementation of Natural Source Zone Depletion (NSZD) programs at multiple sites in Wyoming and Oklahoma. Supported discussions with regulators that ultimately led to NSZD approval in both states. Coordinated purchase of a LICOR $CO_2$-efflux meter for use in NSZD implementation.
- General project experience (2015-present):
  - Developed/implemented MNA data collection and evaluation plans, including sites impacted by petroleum hydrocarbons, chlorinated solvents, and 1,4-dioxane; using advanced data collection tools including compound specific isotope analysis (CSIA) and advanced microbial tools
  - Provided final peer review on project reports for multiple projects
  - Applied expertise using Excel to manage complex/dynamic datasets
  - Provided PFAS sampling field oversight, working closely with field team to ensure implementation of PFAS-compatible sampling procedures, communicating with laboratories on PFAS analytical developments/project needs
  - Developed and implemented data analysis evaluating PFAS site risk for insurance clients
  - Implemented high resolution site characterization (HRSC) tools such as MIP, LIF, HPT
  - Leading and/or supporting proposal efforts, involving a wide range of project types involving emerging contaminants (PFAS), chlorinated solvents, hydrocarbons, or other constituents
  - Collaborating with academic/research laboratories including Colorado State University, Colorado School of Mines, University of California Los Angeles, and CSIRO (Australia)

**Group Manager (2021-2022)**

- Managed group of six personnel in Oklahoma/Texas region
- Coordinated scheduling and workload
- Conducted interviews and supported hiring decisions

*Colorado State University (2003-2015)*

**Laboratory Operations Manager**

- Led development of a research laboratory: developed a vision for necessary equipment and instrumentation for a lab conducting over $1 million a year in funded research
- Supervised laboratory staff and supported/mentored graduate students' research activities

**Research and Development**

- Conducted field and bench-scale research funded by industry and federal sources, involving remediation / subsurface behavior of contaminants including hydrocarbons, chlorinated solvents, PCBs, pesticides, chlorinated benzenes, 1,4-dioxane
- Developed and implemented analytical methods for customized applications involving petroleum hydrocarbons, chlorinated solvents, and other environmental contaminants
- Supported ESTCP/SERDP projects including ER-200519 and ER-1740
- Conducted batch and column studies using novel experimental procedures to evaluate environmental remediation, with a focus on zero-valent iron remediation of chlorinated solvents
- Co-directed, with increasing responsibility over time, the *ZVI-Clay Soil Mixing* remediation technology initiative, which generated $1.5 million in revenue between 2003 and 2015

**Teaching/Advisement**

- Served as primary instructor for Groundwater Engineering (3 credit hours), Spring 2014
- Served as faculty advisor for Sustainable Remediation Forum (SURF) Student Chapter at CSU

## Select Reports and Publications

- **Olson, M**., M. Irianni-Renno, T. Sale, R. Johnson, S. DeLong, R. Rogers, and W. Clayton. Evaluating Long-Term Impacts of Soil-Mixing Source-Zone Treatment using Cryogenic Core Collection. *Ground Water Monitoring and Remediation* (in progress, target submittal December 2024).
- **Olson, M**. 2024. Implications of PFAS in Land-Applied Biosolids. *Remediation Journal* (submitted for review, publication anticipated in 2024 as part of PFAS Expert Panel).
- McAlexander, B., O. Apul, **M. Olson** and J. McCray. 2022. Estimated Greenhouse Gas Emissions from PFAS Treatment of Maine Drinking Water Maine Drinking Water. Volume 31 , Issue 1 *Maine Policy Review* Vol. 31, Nos. 1-2.
- Interstate Technology Regulatory Council (ITRC) PFAS Team. 2023. *Technical Resources for Addressing Environmental Releases of Per-and Polyflouroalkyl Substances (PFAS)*. https://pfas-1.itrcweb.org/
- NGWA. 2017. Groundwater and PFAS: State of Knowledge and Practice
- **Olson**, M., W. Clayton, T. Sale, S. DeLong, M. Irianni-Renno, and R. Johnson. 2017. Final Report: Evaluating Long-Term Impacts of Soil-Mixing Source-Zone. ESTCP project ER-201587.
- Irianni-Renno, M., D. Akhbari, **M. Olson**, A.Byrne, E. Lefèvre, J. Zimbron, M. Lyverse, T. Sale, and S. De Long. 2016. Comparison of bacterial and archaeal communities in depth-resolved zones in an LNAPL body. *Appl Microbiol Biotechnol* 100 (7): 3347-3360.
- **Olson, M.** and T. Sale. 2015. Implications of Soil Mixing for NAPL Source Zone Remediation: Column Studies and Modeling of Field-Scale Systems. *Journal of Contaminant Hydrology 177–178 (2015) 206–219.*
- Zeman, Irianni Renno, **Olson**, Wilson, Sale, and DeLong. 2014. Temperature impacts on anaerobic biotransformation of LNAPL and concurrent shifts in microbial community structure. *Biodegradation*:1-17.
- **Olson, M**., 2014. Remediation of Soil Impacted with Chlorinated Organic Compounds: Soil Mixing with Zero Valent Iron and Clay. Ph.D. Dissertation, Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, Colorado, May 2014.
- **Olson**, M., J. Blotevogel, T. Borch, M. Petersen, R. Royer, and T. Sale. 2014. Long-term potential of in situ chemical reduction for treatment of polychlorinated biphenyls in soils. *Chemosphere* 114 (0):144-149.
- **Olson, M**., T. Sale, C. Shackelford, C. Bozzini, and J. Skeean. 2012. Chlorinated Solvent Source-Zone Remediation via ZVI-Clay Soil Mixing: 1-Year Results. *Ground Water Monitoring & Remediation* 32 (3):63-74.

## Select Presentations and Webinars (*showing only public events in last 4 years without potential sensitivity*)

- *ITRC Training:* US EPA Clean-Up Information (CLU-IN), *May 9, 2024*. *Topics on Biosolids: Sources, Transport, and Management of PFAS Surface Releases*.
- *ITRC Training:* US EPA Clean-Up Information (CLU-IN), *February 29, 2024. Introduction to PFAS Introductory Training,* Naming Conventions and Sources.

- *ITRC Training:* December 14, 2023. Bio*solids Basics: PFAS Sources, Land Application, Treatment, and Regulations*. Society of American Military Engineers (SAME), Boston Chapter.
- *Webinar*: November 2, 2023. *Beyond PFAS: Understanding the Full Spectrum of Emerging Contaminants*.
- *CEU Training:* Wyoming Water Quality and Pollution Control Association. October 26-27, 2023. *Beyond PFAS – Water Treatment Considerations for other Emerging Contaminants (Session 1) and PFAS (Session 2)..*
- *ITRC Training:* US EPA Clean-Up Information (CLU-IN), September 14, 2023. *Introduction to PFAS Introductory Training,* Naming Conventions and Sources; AFFF.
- *Conference Presentation*: Colorado SWANA Annual Conference, Grand Junction, Colorado, September 13, 2023. *PFAS Management Practices in an Evolving Regulatory Landscape*.
- *Conference Presentation*: 2023 NORA Mid-Year Meeting, Indianapolis, IN, June 7-8, 2023. PFAS: Upcoming Regulations & Their Impact for NORA Members.
- *Conference Presentation*: University Consortium, Guelph, ON (remote), May 31-June 2, 2023. The Important Role of Conceptual Site Models in PFAS Site Assessment.
- *Conference Presentation*: Battelle Bioremediation Symposium, Austin, TX, May 8-11, 2023. Clean Water and a Warming Planet: Are Low-Level PFAS Regulations and Greenhouse Gas Reduction Goals Compatible?
- *Webinar*: January 26, 2023. Breaking the PPT Barrier: Implications of Low-Level PFAS Treatment Goals.
- *Conference Presentation*: REMTEC, Denver, CO, October 4-6, 2022. *Enhanced Microbial Treatment of 1,4-Dioxane in a Mixed-Contaminant Source Zone via Bioaugmentation and Cometabolism*.
- *ITRC Training*: REMTEC Europe (remote), September 22, 2022. ITRC PFAS Team Training, Fate and Transport.
- *ITRC Training:* REMTEC, Denver, CO, October 6, 2022. ITRC PFAS Team Training, Site Characterization section.
- *Conference Presentation:* REMTEC, Denver, CO, October 6, 2022. ITRC PFAS Team Training, Site Characterization.
- *ITRC Training*: Battelle Chlorinated Conference, Palm Springs, CA, May 22-26, 2022. ITRC PFAS Team Training, Fate and Transport.
- *Webinar*: November 18, 2021. *Key PFAS Regulatory and Laboratory Method Updates*.
- *Conference Presentation*: 4C Conference, Austin, TX, August 18, 2021. *Treatment and Disposal Options for PFAS*
- *Conference Presentation*: Florida PFAS Updates (remote), May 20, 2021. *A New Paradigm – PFAS Conceptual Site Models*
- *Conference Presentation*: Economic Council of Stats (ECOS) 2020 STEP Meeting, (remote), July 29-30, 2020. *PFAS Fate & Transport, and Technologies for Detecting Groundwater Plumes*

## Professional Affiliations and Certifications

- Licensed as a **Professional Engineer** in Environmental Engineering in Colorado, Nebraska, and Maine
- **Interstate Technology & Regulatory Council (ITRC) PFAS Team**

  -Team member since inception in 2017

  -Author, reviewer, and trainer

  -Co-leader of Training Subgroup, starting in June 2022

  -QC reviewer for *PFAS Water and Soil Values Table* (updated monthly) since 2000

  -Invited to work with PFAS Team leadership on proposal efforts for 2024 continuation
- ASTM: E50.04 PFAS Task Group #2, New Standard Guide for PFAS Sample Collection of Environmental Media (in progress, July 2023 draft): author and reviewer
- National Ground Water Association (NGWA): co-author for PFAS guidance documents
- Barnes & Thornburg PFAS Coalition: participant and reviewer