

Patrick S. Sawyer

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Position

Research Professor – Environmental Science

Program Manager – US DOE Technical Research, Engineering, and Development Services (TREDS) Contract

Professional Summary

Dr. Sawyer has over 35 years of professional experience as a Research Professor, Chemical Engineer and Technical Manager, working for private industry and government contractors. He received his B.S. degree in Chemical Engineering in 1989 from California State University, Long Beach and his M.S. and Ph.D. degrees in Environmental Science from the University of Nevada, Las Vegas (UNLV). His academic research focused on the use of remote sensing imagery to identify the impacts recent climate change has had on alpine environments. Dr. Sawyer is an Emeritus Hazardous Materials Manager. He managed a federal hazardous materials research facility as a contractor for the US Department of Energy. He has over 20 years' experience in the development and execution of highly hazardous experiments for the US government. Since 2019, Dr. Sawyer has been employed with the Desert Research Institute as an Associate Research Professor and Program Manager for the US DOE TREDS Contract. He also serves as the technical lead for the TREDS Defense Nuclear Nonproliferation portfolio. Prior to his government contracting work, Dr. Sawyer spent several years as a chemical engineer for Bechtel Corporation on a variety of projects in the US. Dr. Sawyer is a member of the American Chemical Society and the American Institute of Chemical Engineers.

Relevant Experience

RESEARCH PROFESSOR | DESERT RESEARCH INSTITUTE | SEPTEMBER 2019 – PRESENT

- TREDS Program Manager since 2019, overseeing over 50 researchers from a wide variety of scientific disciplines (geoscientists, physicists, chemists, biologists, atmospheric scientists, archaeologists, risk assessors) and ensuring quality performance and resource allocation.
- Responsible for Integrated Safety Management and fostering a safety culture through lessons learned, management-level field assessments, and safety plan approval processes that correlate to no reportable safety incidents for the TREDS contract.
- Over twenty-five years of experience complying with existing DOE Directives and contributing to the development and review of new/amended directives on topics ranging from operations, security, safety, and quality assurance to scientific and technical information.
- Six years of experience as the technical lead for the TREDS Defense Nuclear Nonproliferation (DNN) work. Develops task plans and oversees support for DNN sponsored experiments at the NNSS, leveraging his twenty-five-year history supporting DNN sponsored experiments at the NNSS including the UNESE and Source Physics experiments.

SENIOR PRINCIPAL ENGINEER | NNSS M&O CONTRACTOR | JULY 1997 – SEPTEMBER 2019

- Managed and executed all hazardous materials experiments at the NNSS Nonproliferation Test and Evaluation Complex (NPTEC) from 1997 through 2019. Work included development of all test execution plans, safety analysis, and work procedures for the safe handling of the highly hazardous materials used for project execution. Supported customer test development activities

as a chemical subject matter expert and served as the team execution lead in the field during hazardous chemical operations.

- Led multi-disciplinary teams of scientists, engineers and technicians on a variety of commercial, defense and national security related experiments.
- Designed and developed unique tools and techniques to support implementation of complex high-risk experiments.
- Author or co-author of several peer-reviewed publications, which are essential for building stakeholder confidence and demonstrating credibility and independence.
- Interfaces with other researchers and stakeholders through presentations at national and international professional meetings.

Professional Experience

- ◇ 2019-present: Desert Research Institute, Division of Hydrologic Sciences, Las Vegas, NV
 - Program Manager, TREDIS Contract with DOE/NNSA: DE-NA0000939 at \$38,779,958. Responsible for overall management of the contract.
- ◇ 2019-present: Desert Research Institute, Division of Hydrologic Sciences, Las Vegas, NV
 - Project Manager/Principal Investigator, Defense Nuclear Nonproliferation Projects, through DE-NA0000939. Responsible for management of DRI support of DNN offices of Research and Development (NA-22) and Nonproliferation and Arms Control (NA-24).
- ◇ 2017-2019: Mission Support and Test Services (MSTS), Las Vegas, NV – M&O Contractor for the Nevada National Security Site (NNSS)
 - Senior Principal Engineer, Field Test Coordinator, Test Director, Project Manager for test and evaluation programs at the Nonproliferation Test and Evaluation Complex (NPTEC). Managed the NPTEC Operations Team. Responsible for test execution, managed field operations and work activities in support of customer testing. Coordinated all field work activities between test participants including the National Labs, the Intelligence Community, DHS, DOD and other participating government agencies. Coordinated three OCONUS missions to Europe, Central America, and Africa in support of government programs.
- ◇ 2005-2017: National Security Technologies (NSTec), Las Vegas, NV – M&O Contractor for the Nevada National Security Site (NNSS)
 - Manager for test and evaluation programs at the Nonproliferation Test and Evaluation Complex (NPTEC). Responsible for test execution, facility operations and work activities in support of customer testing and maintaining facility readiness to support IC and DOE mission requirements.
- ◇ 1997-2005: Bechtel Nevada (BN), Las Vegas, NV – M&O Contractor for the Nevada Test Site (NTS)
 - Senior Chemical/Systems Engineer and Facility/Operations Manager for the HAZMAT Spill Center at the Nevada Test Site. Responsible for the design, procurement, and construction of hazardous chemical systems. Supervise Field Technicians. Manage OSHA PSM compliance. Interact with customers from the US Government and private Industry to develop experiments utilizing the unique capabilities of the facility. Responsible for facility operations and work activities. Developed NEPA documentation and environmental permits to allow hazardous materials testing at the NTS.
- ◇ 1995-1997: Bechtel Corporation, Houston, TX
 - Project Engineer responsible for the design of all the Utility Systems for the Mobil Beaumont Texas Paraxylene Project. Developed Utility Flow Diagrams and a Utility System Design Basis. Performed

pump hydraulic calculations, sized lines, and specified equipment such as pumps, vessels, and compressors. Resident Field Engineering Supervisor for the Mobil Paraxylene Project. Supervised a team of eight Engineers from various disciplines in providing technical support for Construction. Approved all field design changes. Provided start-up support to Operations. Project Engineer for the Amoco/Bechtel Capitol Projects Alliance, responsible for coordination of all engineering activities, scheduling, and cost estimating on small capital projects at the Amoco Texas City Refinery.

- ◇ 1990-1995: Bechtel Corporation, Los Angeles, CA
 - Process/Systems Engineer for numerous projects at Unocal facilities throughout California. Projects included P&ID “as-Built” at the Wilmington Refinery, design of a Wastewater Treatment Plant at the Santa Maria Refinery, and Benzene NESHAPS projects. Control Systems Engineer for the ARCO Clean Fuels Project in Carson California, responsible for Instrument Data Sheets, Control Philosophy Forms, Loop Folders, and Material Requisitions.

Education

PH.D., 2015, UNIVERSITY OF NEVADA, LAS VEGAS; NV; ENVIRONMENTAL SCIENCE

M.S., 2007, UNIVERSITY OF NEVADA, LAS VEGAS; NV; ENVIRONMENTAL SCIENCE

B.S., 1989, CALIFORNIA STATE UNIVERSITY; LONG BEACH; CA; CHEMICAL ENGINEERING

Selected Publications

- Wannberg, V.E., G. Williams, P. Sawyer, and R. Venedam, 2010. An Experimental Field Dataset with Buoyant, Neutral, and Dense Gas Atmospheric Releases and Model Comparisons in Low-Wind Speed (Diffusion) Conditions. *J. Appl. Meteor. Climatol.*, Vol. 49, pp.1805–1817.
- Williams, G., Sawyer, P., Venedam, R., and Wannberg, V., 2011. Comparison of Three Air Transport Models for Safety Applications under Diffusive Conditions Using Full-Scale Experimental Data: EPIcode, ALOHA, and SCIPUFF. *J. Hazard. Toxic Radioact. Waste*, Vol. 15, No. 1, 26–36.
- Sawyer, P.S., and Stephen, H., 2013. Assessing ecological response of the Big Pine Creek watershed to climate change using time series analysis of Landsat surface reflectance data over a 28-year period. *WIT Transactions on Ecology and the Environment*, Vol. 172, WIT Press, pp. 375-386.
- Sawyer, P.S., and Stephen, H., 2014. The Big Pine Creek watershed and climate change: A trend analysis of Landsat surface reflectance and PRISM datasets over the last three decades. *Advances in Space Research*, Vol. 54, pp. 37-48.
- Sawyer, P.S., and Stephen, H., 2014. Comparison of surface reflectance values from the USGS Landsat 5 TM climate data record (CDR) with values generated using a simple dark object subtraction (DOS) method in an Alpine watershed. *International Journal of Earthquake Engineering*, Vol. 1, No. 3.
- Sawyer, P.S., and Stephen, H., 2014. Vegetative response to climate change in the Big Pine Creek watershed along a 2,500-meter elevation gradient using Landsat data. *Earth Sciences*, Vol. 3 No. 6, pp. 137-146.
- Sawyer, P.S., and Stephen, H., 2015. Climate driven vegetative composition changes in the Big Pine Creek watershed using spectral mixture analysis and time series analysis of Landsat surface reflectance data over a 30-year period. *Journal of Biodiversity, Bioprospecting, and Development*, Vol. 2 No. 1, pp. 1-11.

Sawyer, P.S., and Stephen, H., 2016. Surface Cover Spectra of the Big Pine Creek Watershed. *International Journal of Research in Environmental Science*, Vol. 2 No. 1, pp. 29-37.

Wilhelm, Michael; Herzog, Molly; Tonkyn, Russell; Howard, Michael; Sawyer, Patrick; Johnson, Timothy. In Situ Atmospheric Plume Thermometry via Carbon Monoxide Spectral Profile: Laboratory and Field Validation. *ACS Earth and Space Chemistry* 2025, 9, 513–523.

Conference Presentations

Sawyer, P.S., Atmospheric Dispersion Model Validation for Low Wind Speed Conditions, American Chemical Society Western Regional Meeting – Poster Session, San Diego, CA, October 2007

Sawyer, P.S., and Stephen, H., Assessing ecological response of the Big Pine Creek watershed to climate change using time series analysis of Landsat surface reflectance data over a 28-year period, Wessex Institute of Technology –WIT, River Basins Management VII, New Forest, UK, May 2013

Sawyer, P.S., and Stephen, H., Comparison of surface reflectance values from the USGS Landsat 5 TM climate data record (CDR) with values generated using a simple dark object subtraction (DOS) method in an Alpine watershed, International Conference on Advances in Bio-Informatics, Bio-Technology, and Environmental Engineering – ABBE, Westminster University, London, UK, June 2014

Sawyer, P.S., and Stephen, H., Vegetation Index Validation, testing the efficiency of three common indices and three tasseled cap transforms in identifying surface cover trends using long-term surface plots, International Conference on Energy, Environment, and Economics – ICEEE 2016, Heriot-Watt University, Edinburgh, Scotland, UK, August 2016

Parker, B. A., O'Neill, L., Sawyer, P., 2024: Overview of DRI's Technical Research, Engineering, and Development Services (TREDS) Work for DOE for the Low-level Waste Stakeholders Forum, May 15, 2024

Parker, B. A., O'Neill, L., Sawyer, P., 2025: DRI's Technical Research, Engineering, and Development Services (TREDS) Work for DOE, May 22, 2025

Accomplishments and Awards

- Hazardous Materials Manager - Emeritus, CHMM No. 011757
- California EIT License No. XEO84717
- Senior Member - American Institute of Chemical Engineers (AIChE Member # 0090088547)
- Member - American Chemical Society (ACS Member # 2230182)
- Selection Committee Member – Site Directed Research and Development Program for the NNSS
- Awarded the 2024 DRI Outstanding Contributions Medal for outstanding contributions to the Institute

Clearance

Available Upon Request

Citizenship

United States of America