

**CURRICULUM VITAE**  
**Samuel A. Vigil, Professor Emeritus**  
**Civil and Environmental Engineering Department**  
**California Polytechnic State University**  
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**Education:**

- Ph.D. University of California, Davis, Engineering, 1981
- M.S. Texas A & M University, College Station, Civil Engineering, 1974
- B.S. University of California, Berkeley, Civil Engineering, 1969

**Registration And Certifications:**

Registered Civil Engineer, No. 35624, California.  
Board Certified Environmental Engineer, American Academy of Environmental Engineers (Solid Waste Management Specialization)  
LEED Accredited Professional, U.S. Green Building Council  
Emergency Medical Technician, San Luis Obispo County Emergency Medical Agency  
Search and Rescue Technician II, National Association for Search and Rescue

**Experience:**

- 2009-Present Professor Emeritus, Environmental Engineering, California Polytechnic State University, San Luis Obispo, California. Part-time teaching and research assignments in sustainability and solid waste management.
- 1982 - 2009 Professor, Civil and Environmental Engineering, California Polytechnic State University, San Luis Obispo, California. Teaching and research assignments in sustainability, solid waste management, water and wastewater treatment.
- 1980 - 1982 Principal Engineer, Brown and Caldwell Consulting Engineers, Walnut Creek, California. Project engineer and project manager assignments on solid waste and energy recovery projects..
- 1978 - 1980 Associate Development Engineer, Civil Engineering Department, University of California, Davis. Duties included the design, construction, and operation of a pilot scale co-gasification system for sludge and source separated solid waste.
- 1975 - 1978 Teaching Assistant, Civil Engineering Department, University of California, Davis. Teaching assignments included graduate and undergraduate laboratory classes in surveying, and wastewater treatment pilot studies.

- 1975-1995 Commissioned Officer, U.S. Navy Civil Engineer Corps (Reserve Duty), construction, and environmental engineering projects on U.S. Navy bases in the U.S., Europe, and Southeast Asia. Retired in 1995 with the rank of Commander.
- 1973 - 1974 Research Assistant, Civil Engineering Department, Texas A&M University. Duties included water quality monitoring of lakes, bays, and rivers, and preparation of environmental impact statements.
- 1969 - 1973 Commissioned Officer, U.S. Navy (active duty). Electronics and communications assignments in Washington, D.C. and Puerto Rico.
- 1969 - 1969 Civil Engineer, Lawrence Livermore National Laboratory. Site design for underground nuclear tests. Summer
- 1963-1967 Computer Operator, Lawrence Livermore National Laboratory. Part-time and summers. Operation of IBM and CDC mainframe computers.

### **Membership In Professional Societies:**

Air and Waste Management Association (Fellow)  
American Academy of Environmental Engineers (Life Member)  
American Geophysical Union  
Solid Waste Association of North America  
U.S. Green Building Council

### **Honors And Awards:**

Richard I. Stessel Waste Management Award, Air and Waste Management Association. The award recognizes individuals for outstanding achievements in waste management science and technology and education, January, 2015.

Best Paper Award, 2013 Air and Waste Management Association Regional Specialty Conference on Sustainable Resources and Air Quality Management in Yilan, Taiwan, "Remote Sensing of Greenhouse Gases from Landfills," October 2013.

Elected as a Fellow of the Air & Waste Management Association, January, 2012.

Iraj Zandi Award, Journal of Solid Waste Management and Technology, Philadelphia, PA, "The award is given annually to an individual who has inspired and led students in their careers in the field of solid waste. Dr. Vigil is certainly such an inspiration. His textbook has been used by thousands of students worldwide and is generally considered the standard text in the field." March 2011

Keynote Speaker, First International Symposium on Advanced Waste and Emission Management, Nagoya University, Nagoya, Japan, December 2000.

Best Architectural Research Project in 1998, "Energy Efficient Resource Recovery Project for Cal Poly State University", Architecture Magazine, April 1998 (with D. Panetta, D. Williams, R. Lang, et al).

Best Air Quality Paper, TAPPI 1998 Environmental Conference, "Evaluation of the EPA Recommended Approach to Predicting Air Emissions from Pulp and Paper Industry Landfills," (with R. Lang, et al)

Navy Commendation Medal, for meritorious service while serving as Environmental Program Manager of the Reserve Division, Naval Facilities Engineering Command. Established two Reserve Environmental Engineering Units which provided over \$1 million dollars of engineering services to the Atlantic and Pacific Fleets in their first year of operation. Awarded December 1993.

#### **Patents:**

Vigil, S.A., and Spielman, R.B., "Method and Apparatus for Generating Electrical Energy from a Heated Gas Containing Carbon Particles," U.S. Patent Number 4,516,043 of May 7, 1985.

#### **Books:**

Tchobanoglous, G., H.M. Theisen, and **S.A. Vigil**, Integrated Solid Waste Management: Engineering Principles and Management Issues, McGraw Hill, 1993, 978 pages. (Spanish translation published in 1995 by McGraw-Hill de Espana, Madrid; Japanese, Chinese, and Korean translations published in 1998 by McGraw-Hill International.)

#### **Engineering Reports**

Brewer, W.A., Hoffman, G., Silver, E., DiLeonardo, C., Henderson, J. R., and **Vigil, S.A.**, "Evaluating Use of Satellite Observations for Detecting Large CO<sub>2</sub> Leaks and Carbon Sequestration Monitoring," Lawrence Livermore National Laboratory, LLNL-TR-568072, August 1, 2012.

**Vigil, S.A.** and H.M. Theisen, "Review Of Leachate Treatment Technologies", World Bank, Washington, D.C., August 27, 2012.

**Vigil, S.A.**, Roberts, R.M., Brunner, D.E., "Solid Waste Resource Alternatives, U.S. Facility, Subic Bay, Philippines, Report Number, TN-1721, Naval Civil Engineering Laboratory, Port Hueneme, CA, March 1985,

## **Presentations and Conference Proceedings:**

(Many are available for downloading at <http://works.bepress.com/svigil/> )

Krautwurst, S., Gerilowski, K., Jonsson, H. H., Thompson, D. R., Kolyer, R. W., Iraci, L. T., Thorpe, A. K., Horstjann, M., Eastwood, M., Leifer, I., **Vigil, S. A.**, Krings, T., Borchardt, J., Buchwitz, M., Fladeland, M. M., Burrows, J. P., and Bovensmann, H., "Methane Emissions from a Californian Landfill, Determined from Airborne Remote Sensing and In Situ Measurements", *Atmos. Meas. Tech.*, 10, 3429-3452, <https://doi.org/10.5194/amt-10-3429-2017>, 2017.

**Vigil, S.A.**, "Landfills: The Ecology of a Man Made Ecosystem", Presented at the Jet Propulsion Laboratory, Carbon Club Meeting, Pasadena, CA, May 25, 2016

**Vigil, S.A.**, Leifer, I., Bovensman, H., Gerilowski, K., Krautwurst, S., Jonsson, H., Kolyer, R., and Fladeland, M. M., "Aircraft and Mobile Surface Measurements of Fugitive Methane Emissions from Southern California Landfills," Proceedings of the 108th Annual Conference and Exhibition of the Air and Waste Management Association, Raleigh, NC, June 22nd - 25th, 2015.

Gerilowski, K., Kolyer, R., Jonsson, H., Krings, T., Horstjann, M., Leifer, I., **Vigil, S.A.**, Buchwitz, M., Schüttemeyer, D., Fladeland, M. M., Burrows, J. P., and Bovensmann, H., "Initial Results of Detected Methane Emissions from Landfills in the Los Angeles Basin During the COMEX Campaign by the Methane Airborne MAPper (MAMAP) Instrument and a Greenhouse Gas In-Situ Analyzer," Presented at the European Geosciences Union General Assembly 2015, Vienna, Austria, April 12 – 17, 2015.

Tubío-Pardavila, R., **Vigil, S. A.**, Puig-Suari, J., and Aguado-Agelet, F., "The HUMSAT System: A CubeSat-based Constellation for In-situ and Inexpensive Environmental Measurements," Poster presented at the 2014 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 15 - 19, 2014.

**Vigil, S.A.**, Leifer, I., Berman, E., Chang, C., Frash, J., Hall, J., Iraci, L., Leen, B., Lundquist, T., Melton, C., Tratt, D., and Wilson, E., "The COW-Gas (Cal pOly Winter Gas) Campaign: Continuous Mobile and Stationary Methane Monitoring by In Situ and Column Measurements at the Cal Poly Research Dairy," Poster Presented at the NASA HypIRI Science and Applications Workshop, California Institute of Technology, Pasadena, CA, October 14-16, 2014.

Leifer, I, Tratt, D., Eglund, E. T., Gerilowski, K., **Vigil, S.A.**, Buchwitz, M., Krings, T., Bovensmann, H, Krautwurst, S., and Burrows, J.P., "Investigation of Greenhouse Gas Emissions by Surface, Airborne, and Satellite on Local to Continental Scale," Presented at the 2013 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 9 - 13, 2013.

Tratt, D.M, Buckland, K. N., Hall, J.L., Young, S.J., Leifer, I., and **Vigil, S.A.**, “Identification and Source Attribution of Gaseous Effluents using High-Resolution Airborne Thermal-Infrared Imaging Spectrometry,” Presented at the Air and Waste Management Association, Air Quality Measurement Methods and Technology Conference, Sacramento, California, November 19-21, 2013.

**Vigil, S.A.**, “Gasification of Solid Waste Residuals as Part of A Zero Waste Strategy,” Presented at Air and Waste Management Association Regional Specialty Conference on Sustainable Resources and Air Quality Management, Yilan, Taiwan, October 23 - 25, 2013.

**Vigil, S.A.** and Leifer, I., “Remote Sensing of Greenhouse Gases from Landfills,” Presented at Air and Waste Management Association Regional Specialty Conference on Sustainable Resources and Air Quality Management, Yilan, Taiwan, October 23 - 25, 2013.

Brewer, B., Hoffmann, G., Silver, E., DiLeonardo, C., **Vigil, S.A.**, and Henderson, J., “CO<sub>2</sub> Sequestration Leak Detection Using Satellite-Based Sensors,” Presented at the 2011 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 5 - 9, 2011.

**Vigil, S. A.** , “Satellite Remote Sensing of Landfill Gas in Developing Countries,” Proceedings of The Twenty-Sixth International Conference On Solid Waste Technology and Management, Philadelphia, PA, March 27-30, 2011.

Yesiller, N., **Vigil, S.A.**, and Hansen, J.L., “Assessment of State Composting Regulations in the United States,” Proceedings of The Twenty-Sixth International Conference On Solid Waste Technology and Management, Philadelphia, PA, March 27-30, 2011.

**Vigil, S.A.** and Bovensmann, H., “The Measurement of Landfill Gas Emissions with the Orbiting Carbon Observatory and CarbonSAT Satellites,” Poster Presented at the 2010 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 13 – 17, 2010.

**Vigil, S.A.** and Crisp, D., “The Use of Data from the Orbiting Carbon Observatory to Measure Greenhouse Gas Emissions from Landfills,” Proceedings of the 103rd Annual Meeting and Exhibition of the Air and Waste Management Association, Calgary, Alberta, Canada, June 2010.

**Vigil, S. A.**, “Solid Waste and Biomass Gasification,” Proceedings of the 103rd Annual Meeting and Exhibition of the Air and Waste Management Association, Calgary, Alberta, Canada, June 2010.

Rupp, S.E., and **Vigil, S.A.** , “Sustainability, Source Reduction, and Recycling Programs at New United Motors Manufacturing, Inc.,” Proceedings of the 102nd Annual Meeting and Exhibition of the Air and Waste Management Association, Detroit, MI, June 2009.

**Vigil, S.A.**, “Development of a Laboratory Based Sustainability Course for Environmental Engineers,” Proceedings of the 101st Annual Meeting and Exhibition of the Air and Waste Management Association, Portland, OR, June 2008.

Heinrichs, G., **Vigil, S.A.**, et al, "Handbook of Guidelines : Ecology Meets Technology, Sustainable Technology Park", College of Architecture and Environmental Design, California Polytechnic State University, San Luis Obispo, 2006. (Chapters on Renewable Energy, Water Conservation and Wastewater Treatment, and Renewable Materials and Construction Waste Management)

Tsuji, A, Nelson, Y., Kean, A, and **Vigil, S.A.**, "Recyclability Index for Automobiles," Proceedings of the 99th Annual Meeting and Exhibition of the Air and Waste Management Association, New Orleans, LA, June 2006.

**Vigil, S.A.**, "Environmental Management of Wastes in the Semiconductor and Electronics Industries," Proceedings of the First International Symposium on Advanced Waste and Emission Management, Nagoya University, Nagoya, Japan, December 2000.

**Vigil, S.A.**, and Zueck, D., "Environmental Applications of the Global Positioning System," Proceedings of the 92nd Annual Meeting and Exhibition of the Air and Waste Management Association, St. Louis, Missouri, June 1999.

Lang, R.J., **Vigil, S.A.**, and Melcer, H, "Techniques for Modeling Hazardous Air Pollution Emissions from Landfills," Proceedings of the 91<sup>st</sup> Annual Meeting and Exhibition of the Air and Waste Management Association, San Diego, California, June 14-18, 1998.

Melcher, H., Lang, R., **Vigil, S.A.**, and Maltby, C., "Evaluation of the EPA Recommended Approach to Predicting Air Emissions from Pulp and Paper Industry Landfills," presented at the 1998 TAPPI Environmental Conference, May 1998.

**Vigil, S.A.**, and Panetta, D., Williams, D., Lang, R. et al. "Energy Efficient Resource Recovery Project for Cal Poly State University", *Architecture Magazine*, April 1998 (with

Cota, H.M., and **Vigil, S.A.**, "Environmental Engineering Design," Proceedings of the 90<sup>th</sup> Annual Meeting and Exhibition of the Air and Waste Management Association, Toronto, Canada, June 8-13, 1997.

Rupp, S., **Vigil, S. A.**, "Recycling and Pollution Prevention Programs at New United Motors Manufacturing, Inc., Fremont, California," Proceedings of the 89th Annual Meeting and Exhibition of the Air and Waste Management Association, Nashville Tennessee, June 23 - 28, 1996.

Mull, S. R., Lang, R. J., **Vigil, S.A.**, Cota, H., "PC Windows Finite Element Modeling of Landfill Gas Flow, Proceedings of the 1996 National Waste Processing and NAWTEC-IV Waste-to-Energy Conference, American Society of Mechanical Engineers, New York, New York, 1996.

**Vigil, S.A.**, "Development of a Graduate Integrated Waste Management Course Using the Case Study Approach," Proceedings of the 88th Annual Meeting and Exhibition of the Air and Waste Management Association, San Antonio, Texas, June 18-23, 1995.

**Vigil, S.A.**, and Holter, G.M., "Application of Macro Material Flow Modeling to the Decision Making Process for Integrated Waste Management Systems," Proceedings of the 1995 International Conference on Solid Waste Management: Thermal Treatment and Waste-to-Energy Technologies, Washington, D.C., April 18-21, 1995.

**Vigil, S.A.**, and Tchobanoglous, G., "Comparison of the Environmental Effects of Aerobic and Anaerobic Composting Technologies," Proceedings of the 87th Annual Meeting and Exhibition of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Heine, W.A., and **Vigil, S.A.**, "The Naval Reserve Civil Engineer Corps Environmental Engineering Program," Proceedings of the 86th Annual Meeting and Exhibition of the Air and Waste Management Association, Denver, Colorado, June 13-18, 1993.

**Vigil, S.A.**, and Tchobanoglous, G., "Development of Solid Waste Courses at the Undergraduate and Graduate Level," Proceedings of the 1992 National Waste Processing Conference, American Society of Mechanical Engineers, New York, New York, 1992.

**Vigil, S.A.**, and Thiesen, H., "Graphical Integrated Waste Management Model for Puerto Rico," Proceedings of the 1992 National Waste Processing Conference, American Society of Mechanical Engineers, New York, New York, 1992.

**Vigil, S.A.**, "Surabaya, Indonesia : Options in Solid Waste Management". Proceedings of the Second European Conference on Environmental Technology, Amsterdam, The Netherlands, June 22 – 26, 1987.

**Vigil, S.A.**, and Zevely, J.A., "Microcomputer Solid Waste Financial Model," Proceedings of the 1986 National Waste Processing Conference, American Society of Mechanical Engineers, New York City, New York, 1986.

Tchobanoglous, G., Sorbo, N. and **Vigil, S.A.**, "Thermal Gasification of Densified Sludge and Wastepaper" presented at the International Conference on Thermal Conversion of Municipal Sludge, U.S. Environmental Protection Agency, Hartford, Connecticut, March 21-24, 1983.

Davis, D.A., **Vigil, S.A.**, and Tchobanoglous, G., "Evaluation of Residual Char from the Gasification of Solid Wastes as a Substitute for Powdered Activated Carbon," Proceedings of the Third Symposium on Biotechnology in Energy Production and Conservation, John Wiley & Sons, Inc. New York, 1981.

Ortiz-Canavate, J., **Vigil, S.A.**, Goss, J., and Tchobanoglous, G., "Comparison of Operating Characteristics of 35 - kw Diesel Engine Fueled With Low Energy Gas, Biogas, and Diesel Fuel," Proceedings of the Third Symposium on Biotechnology in Energy Production and Conservation, John Wiley & Sons, Inc., New York, 1981.

**Vigil, S.A.**, Bartley, D.A., Healy, R., and Tchobanoglous, G., "Operation of Packed Bed Gasifiers Fueled with Source Separated Solid Waste," Thermal Conversion of Solid Wastes and Biomass, ACS Symposium Series 130, American Chemical Society, Washington, D.C., 1980.

Bartley, D.A., **Vigil, S.A.** and Tchobanoglous, G., "The Use of Source Separated Paper as a Biomass Fuel," Proceedings of the Second Symposium on Biotechnology in Energy Production and Conservation, John Wiley & Sons, Inc., New York, 1980.

**Vigil, S.A.**, Tchobanoglous, G., and Schroeder, E.D., "Application of Packed Bed Gasifiers to the Reduction of Solid Wastes and the Recovery of Energy" Proceedings of the 1979 National Conference on Environmental Engineering: San Francisco CA, July 1979: 434-441.

### **Research and Education Projects**

Review of Waste and Material Handling Regulations for California. (2009 to 2010)  
Funded by the California Integrated Waste Management Board. Co-PI.

Development of a "Handbook of Performance Driven Guidelines" for a Sustainable Technology Park for the Cal Poly Campus, San Luis Obispo. (2004 to 2005). Co-PI. Responsible for Chapters on Renewable Energy, Water Conservation and Wastewater Treatment, and Renewable Materials and Construction Waste Management.

Development of a Composting Best Practices Manual for California. (1999 to 2000) Funded by the California Integrated Waste Management Board. Co-PI.

Energy Efficient Resource Recovery Project for Cal Poly State University. (1997) Funded by the Renewable Energy Institute, California Polytechnic State University. Co-PI.

"Planning and Management For Municipal Solid Waste", Symposium and Professional Development Course, University College, Dublin, Ireland May 12-14, 1997. Co-PI.

Solid Waste Management Problem Solving: Materials Recovery and Recycling Systems. A short course for California Integrated Waste Management Board Staff. Co-PI (December 1995)

Science and Technology Research Priorities for Waste Management in California, (1991 to 1992), Funded by the California Council on Science and Technology for the California Integrated Waste Management Board. Co-PI.

Development of a Microcomputer Model for Integrated Solid Waste Management. (1985 to 1986). Funded by the California Integrated Waste Management Board. PI.