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**JAMES A. JACOBS**  
 Principal Geologist

**Designations**

P.G., C.H.G., C.P.G., F.G.S., C.Pet.G., ToR QISP, ToR QSD/QSP

**Education**

M.A. Geology, University of Texas, Austin, Texas, USA, August 1981  
 B.A. Geology, English, Franklin and Marshall College, Lancaster, Pennsylvania, USA, June 1978

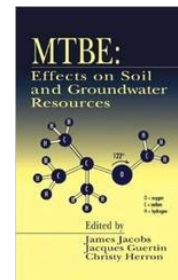
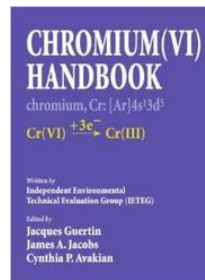
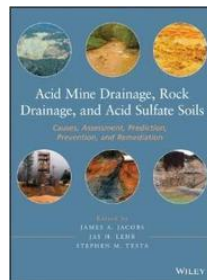
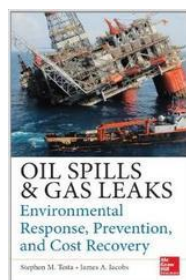
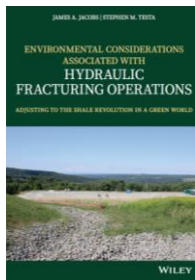


He is a certified hydrogeologist, professional geologist, licensed well driller and general engineering contractor. His most recent work includes forensic analysis related to subsurface events, including pipe breaks, contaminant spills, oil and gas resource valuation estimates, and groundwater contamination. He has worked on a variety of producing and redeveloped oil field properties, EPA Superfund sites, military bases, agricultural and industrial properties. Since 1990, he has been a co-owner of an environmental-engineering consulting and contracting company, where he has performed more than 1,000 projects.

As a publicly elected community services district board member since 2003, he has evaluated numerous environmental challenges, solved sustainability problems, and worked with others as a team leader and member to develop public agency policies. He has been involved with the public process of goal setting, data acquisition, development of workplans, and implementation of field projects. He has promoted and supported sustainable environmental practices within the agency, a certified green business which now offers residents recycling of electronic waste, fluorescent bulbs, medicines, batteries, paper and cardboard. In an effort to minimize local groundwater degradation, in 2009, 1 million less lbs of waste were processed by the agency than in 2006. In 2013, the agency won the Marin County Green Business of the Year award due to the successful recycling efforts and reduction in wastes shipped to the local landfills. For mentoring students, he is the AIPG Sponsor of the UC Davis Geology Student Section (since 2010), Sonoma State University Geology Student Section (since 2016), SRTM University (India, since 2017) and UC Santa Cruz (since 2020).

**Publications - Technical Books:** Books co-authored by James Jacobs:

He has developed, edited and co-authored five technical books related to the unintended consequences of large-scale industrial processes, most notably, *MTBE: Effects on Soil and Groundwater Resources* (CRC Press, 2001), *Chromium [Cr(VI)] Handbook* (CRC Press, 2004), *Oil Spills and Gas Leaks: Environmental Response, Prevention, and Cost Recovery* (McGraw-Hill, 2014), *Acid Mine Drainage* (Wiley, 2014) and *Environmental Considerations Associated with Hydraulic Fracturing Operations: Adjusting to the Shale Revolution in a Green World* (Wiley, 2019). He has written over 100 articles and given over 50 technical presentations.



**Subject Matter Expert**

He has been involved as a hydrogeologist and water expert witness on hundreds of legal cases, testifying 21 times in 19 cases since 1991. He is a Fellow of the Geological Society (of London) and the National Ground Water Association (NGWA). In 2016, he was named a Virtual Fellow at the U.S. State Department for his work on Cabo Verde and Energy Sustainability. He has explained complex water issues as part of a legislative team of professional geologists to California legislators and in Washington, D.C. during legislative meeting days. He has been selected and served on various state board panels as a subject matter expert.



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### **Peer Review**

Mr. Jacobs serves in a peer review capacity for several organizations.

- Fulbright Program - He served from 2006 to 2011 on the Fulbright Peer Review Committee, screening candidates in the Fulbright Senior Specialists Program in geology and environmental science.
- AIPG - From 2005 to 2010, he served on the National Screening Committee for the American Institute of Professional Geologists for candidates applying for the Certified Professional Geologist designation.
- AEHS - Since 2005, he has been on the Science Advisory Board for the Association for Environmental, Health and Sciences . The duties include the review of abstracts submitted for presentations for the annual San Diego, California Soils, Sediments, and Water conference and reviewing student presentations.
- UC/CalEPA - In October 2011, Jacobs performed a peer review for the University of California Regents under contract to CalEPA of the 2007 PG&E Hinkley, California (subject of *Erin Brockovich* movie) Background Study Report.
- Wiley Editorial Board as Associate Editor for the Wiley Encyclopedia of Water, Science, Technology, and Science, including co-author of 31 articles, paper version published 2020, 5-volumes, April, 1<sup>st</sup> Edition, Wiley, Hoboken, NJ., 2,976 pages, online version available December 2019.

### **International Experience**

Jacobs has taught classes and workshops on groundwater sustainability and management to groups of students, professors, consultants, and regulators in Jamaica, Israel, Germany and India.

### **Academic Awards**

1981: R.K. DeFord Field Scholarship Award; University of Texas at Austin  
2003: Fulbright Senior Scholar Award, Univ. of West Indies, Kingston, Jamaica; February–March;  
2004: Fulbright Senior Scholar Award, Univ. of West Indies, Kingston, Jamaica; March–April;  
2008: Fulbright Senior Scholar Award, Afeka Engineering College, Tel Aviv, Israel; March–April;  
2012: Fulbright Senior Scholar Award, SRTM University, Nanded, India; January – February;  
2016: Virtual Fellow, U.S. Department of State, Cabo Verde’s Road Map to 100 Percent Renewable Energy  
2016: Fellow: National Ground Water Association  
2020: Fellow; Geological Society (of London)

### **Professional Awards**

1998: Groundwater Resources Association; President's Tribute Certificate  
2001: American Institute of Professional Geologists, National Presidential Certificate of Merit  
2004: California Council of Geosciences (CCGO) “Gold Award”  
2010: American Institute of Professional Geologists, National Presidential Certificate of Merit  
2011: American Institute of Professional Geologists: Honorary Membership Award  
2015: American Institute of Professional Geologists: Martin Van Couvering Memorial Award  
2020: American Institute of Professional Geologists: Section Leadership Award

### **Committee and Board Appointments**

2005–present: Science Advisory Board, Association for Environmental Health and Sciences  
2007–2011: Selected and Served on Fulbright Senior Specialists Peer Review Committee; CIES  
2014 – present: ASTM International (American Society of Testing Materials), Committee Member:  
ASTM Committee D-18 on Soil and Rock  
ASTM Committee E-50 on Environmental Assessment, Risk Management and Corrective Action  
2017 – present: Interstate Technical & Regulatory Council (ITRC): Methane Detection Committee Member  
2020 – present: Invited to serve on the Technical Advisory Committee (TAC) for the San Francisco Bay Climate Resilience Challenge (CRC) Groundwater/SLR Study sponsored by the San Francisco Estuary Institute (SFEI).



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### **Publicly Elected Positions**

2003–present: Director : Tamalpais Community Services District; President or Vice President (2004-2012)

2003–present: Commissioner: Sewerage Agency of Southern Marin; Vice President (2008), President (2009-2011)

### **Certifications and Licenses**

Certified Professional Geologist, American Institute of Professional Geologists, # 7760

Licensed Professional Geologist: California #4815; Alaska #A227, Arizona #39066, Idaho #693, Oregon #G-1147, Pennsylvania: # 1152G, Texas Geology #11552, Wyoming: #PG-2328, Washington #1815

Certified Hydrogeologist: California #0088, Washington #1815

Certified Petroleum Geologist, American Association of Petroleum Geologists, #6231

Registered Environmental Assessor I: California # 1511; REA II: #20171 (program discontinued).

Registered Asbestos Inspector: AHERA Accredited; OLA Registration # 0000450

California Qualified Stormwater Pollution Prevention Plan Developer (QSD) and Preparer (QSP); Certificate #21430  
QSD/QSP California General Permit (CGP) Trainer of Record (ToR); August 2016

California Qualified Industrial Stormwater Pollution Practitioner (QISP); Certificate #00617; March 2017

QISP California Industrial Permit (CIP) Trainer of Record (ToR); May 2017

CSLB License #624461: Driller (C-57), General Engineering, Hazardous Materials Removal, Asbestos Abatement

California Commercial Driver License: C with Hazmat Endorsement

### **Professional History**

1990- present; Principal Geologist; The Auger Group, Inc., dba Clearwater Group, Pt. Richmond, California

2002-present; Geologist; Environmental Bio-Systems, Mill Valley, California

1989-1990 Project Geologist, Harding & Lawson Associates (now Wood Group), Novato, California

1986-1989 Senior Oil Geologist, Petrofina Delaware (now Total, S.A.), Houston, Texas

1981-1985 Exploration Oil Geologist, SOHIO Petroleum (now BP), San Francisco, California and Anchorage, Alaska

1979-1981 Institute of Applied Sciences, North Texas State University, Denton, Texas

1975-1978 Technician, U.S. Bureau of Mines, Coal Research Station, Bruceton, Pennsylvania

### **Professional Associations**

American Association of Petroleum Geologists (AAPG): Active Member 1979 to present; Div. Environmental Geosciences (July 2012); CPetG (Feb 2014)

American Institute of Professional Geologists (AIPG); Elected National AIPG Advisory Board: 2000; Elected National AIPG Vice President; 2013; State President or Vice President: 1996 to present.

Sponsor of AIPG Student Chapters: UC Davis 2010 to present, Sonoma State University: 2016 to present, SRTM University 2017 to present, and UC Santa Cruz 2020 to present.

American Society for Testing and Materials (ASTM International), 2014 to present, Committee D18 on Soil and Rock; Committee E50 on Environmental Assessment, Risk management and Corrective Action

Assoc. for Environmental Health and Sciences (AEHS); 2002 to present; Science Advisory Group (2005 to present)

California Council of Geoscience Organizations (CCGO): President 2000 to present

California Stormwater Quality Association (CASQA): 2016 to present

CORE Environmental Foundation (non-profit): Co-founder and President 2009-2011

ECON Magazine - Editorial Advisory Board, 1994 to 1996

Forensic Expert Witness Association; Member (FEWA); 2014 to present

Fulbright Association – Lifetime Member, 2014 to present

Geological Society (of London); Fellow (FGS), Fellowship # 0001042272, 2020

Groundwater Resources Association of California (GRAC), Director, GRAC 1999 – 2004; Treasurer 1999, 2002

GRAC SF Branch: President: 1996-1998; 2009-2010; Vice President: 1995, Field Trip Coordinator: 1998, Technical Chairman: 1994

Interstate Technology and Regulatory Council (ITRC); 2017 to present; Methane Detection; Stormwater BMPs

National Ground Water Association (NGWA); Member 1989 to present

### **Classes and Workshops Taught**

Jacobs designed and taught the Sustainable Remediation Methods for Soils and Water (X-451) for the University of California, Berkeley Extension program in the spring semester 2011 and in fall semester 2011. Jacobs has taught other environmental workshops and graduate classes focused on sustainable environmental practices, recycling, and practical



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remediation efforts at the University of West Indies (Mona Campus), Jamaica (1 grant was for 20 days of instruction); Afeka Engineering College, Israel (40 hours of instruction, with others), and SRTM University, India (42 hours of instruction, with others). A complete list classes and workshops is included below. Jacobs has participated in co-teaching continuing education workshops for AEHS, AIPG, GRAC, and CUPA.

#### **Publications - Technical Books**

Books co-authored by James Jacobs (ordered by most recent):

Jacobs, J. and Testa, S., 2019, *Environmental Considerations Associated with Hydraulic Fracturing Operations: Adjusting to the Shale Revolution in a Green World*, John Wiley, & Sons, Inc., Hoboken, NJ; 592 p.

Testa, S., and Jacobs, J., 2014, *Oil Spills and Gas Leaks: Environmental Response, Prevention, and Cost Recovery*, McGraw-Hill Education, New York, NY; 578 p.

Jacobs, J., Testa, S. and Lehr, J., eds., 2014, *Acid Mine Drainage, Rock Drainage and Sulfate Soils: Causes, Assessment, Prediction, Prevention, and Remediation*, John Wiley, & Sons, Inc., Hoboken, NJ; 486 p., Jacobs co-authored half of the articles in this volume.

Guertin, J., Jacobs, J., and Avakian, C., eds., 2004, *Chromium (VI) Handbook*, CRC Press, Boca Raton, Florida; 784 p. Jacobs co-authored 19 of the articles in this volume.

Jacobs, J., Guertin, J., and Herron, C., eds., 2001, *MTBE and its effect on Soil and Groundwater Resources*, CRC Press, Boca Raton, Florida; 264 p., Jacobs co-authored many articles.

#### **Publications - Chapters in Books**

- 31 articles in the Wiley Water Encyclopedia, 2020, Wiley-Interscience, Hoboken, NJ.
- 41 articles in the Water Encyclopedia, 5-Volume Set, 2005, Wiley-Interscience, Hoboken, NJ.
- 9 articles in *Standard Handbook of Environmental Science, Health, and Technology*, 2000, McGraw-Hill Handbook Series, New York, NY.
- 2 chapters in *Handbook of Complex Environmental Remediation Problems*, 2001, McGraw-Hill Handbook Series, New York, NY.

#### **Peer-Reviewed Articles**

Wagh, V.M., Panaskar, D.B., Jacobs, J.A., Mukate, S.V., Muley, A.A., and Kadam, A.K., 2019, Influence of hydro-geochemical processes on groundwater quality through geostatistical techniques in Kadava River basin, Western India, *Arabian Journal of Geosciences*, Springer Berlin Heidelberg, January, V. 12, Issue 1, 25 pp.,

Mukate, S.V., Wagh, V., Panaskar, D., Jacobs, J.A., and Sawant, A., 2019, Development of new integrated water quality index (IWQI) model to evaluate the drinking suitability of water, *Ecological Indicators*, Elsevier, Amsterdam, Netherlands, V. 101, June, p. 348-354.

Interstate Technology and Regulatory Council (ITRC), 2018, Evaluation of Innovative Methane Detection Technologies, ITRC.org; Methane-1, co-author with more than a dozen state regulatory representatives.

Roghani, M., Jacobs, O.P., Miller, A., Willett, E.J., Jacobs, J.A., Viteri, C.R., Shirazi, E., and Pennell, K.G., 2018, Occurrence of Chlorinated Volatile Organic Compounds (VOCs) in a Sanitary Sewer System: Implications for Assessing Vapor Intrusion Alternative Pathways, *Science of the Total Environment*, March, 616–617, p. 1149–1162.

Jacobs, J.A., Jacobs, O.P., and Pennell, K.G., 2017, One Alternative Exposure Pathway of Volatile Organic Compound (VOC) Vapors from Contaminated Subsurface Environments into Indoor Air – Legacy Sewer-Plumbing Systems, *The Professional Geologist*, Reprint and Update of GRAC *Hydrovisions* Article, V. 54, N. 3, July-Aug-Sept., p. 28 – 32.

Jacobs, J. A., Testa S.M., Alpers, C.N., and Nordstrom, D.K., 2016, An Overview of Environmental Impacts and Reclamation Efforts at Iron Mountain Mine, Shasta County, California, in *Applied Geology in California*, ed. Anderson, R., and Ferriz, H., Association of Environmental and Engineering Geologists, p. 427-446.



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Jacobs, J. A., Grant Ludwig, L., 2016, Exposure to Valley Fever in California – Recent Trends and Prevention for Geologists, Construction Workers, and Related Occupations, in *Applied Geology in California*, ed. Anderson, R., and Ferriz, H., Association of Environmental and Engineering Geologists, p. 511-523.

Jacobs, J. A. and Guertin, J., 2009, Overview of Cleanup Design Options and Treatability Testing for In Situ Remediation of Soil and Groundwater, *The Professional Geologist*, American Institute of Professional Geologists, July/August, V. 46, No. 4, p. 43-50.

#### **Selected Articles and General Publications**

Baker, S. and Jacobs, J., 1997, The Government's New Environmental Role, *Sacramento Business Journal*, March 17.

Goldberg, L., and Jacobs, J., 2000, Brownfields, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 16.21 -16.32.

Hartman, B., and Jacobs, J., 2000, Soil Vapor Principles, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.87 -11.95.

Hartman, B., and Jacobs, J., 2000, Applications and Interpretation of Soil Vapor Data to Volatile Organic Compound Contamination, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.96 – 11.112.

Jacobs, J.A., 2017, Acidic Drainage from Newly Deglaciated Areas with Sulfide-Rich Surficial Rocks- Possible Mitigation Measures, in *Technological Advances in Climate-Smart Agriculture and Sustainability (TACSAS)*, Proceedings of International Conference on TACSAS-2017, SRTM University, Nanded, India, ed. Waikar, M.L. et. al., Excel India Publishers, New Delhi, India, p. 436-440.

Jacobs, J.A., Jacobs, O.P., and Pennell, K.G., 2015, One Alternate Exposure Pathway of VOC Vapors from Contaminated Subsurface Environments into Indoor Air - Legacy Sewer- Plumbing Systems, *Groundwater Resources Association of California, Hydrovisions*, Spring 2015, p. 20-24.

Jacobs, J.A. and Geddes-McDonald, L., 2005, *Groundwater and Nitrate: Chemical Behavior and Treatment*, Wiley Water Encyclopedia, Wiley, Hoboken, N.J.

Jacobs, J., and Testa, S.M., 2003, Design Considerations for *In-Situ* Chemical Oxidation Using High Pressure Jetting Technology, Association for Environmental Health and Sciences, *AEHS Soil, Sediment and Water*, March/April p. 51-60.

Jacobs, J., Kram, M., and Lieberman, S., 2000, Direct Push Technology Sampling, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.151 – 11.163.

Jacobs, J., and Phillips, J., 2000, Global Positioning Systems (GPS) and Environmental Projects, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.1 – 11.15.

Jacobs, J., 2000, Monitoring Well Construction and Sampling Techniques, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.46 – 11.68.

Jacobs, J., 2000, Passive *In-situ* Remediation Systems, *Standard Encyclopedia of Environmental Science and Technology*, J. Lehr, ed., McGraw Hill, New York, NY; p. 14.12 – 14.25.

Jacobs, J., Ruslen, D., MacLeod, S., and Taylor, T., 1999, *In-Situ* High Pressure Remediation Injection Process, *Hydrovisions*, Fall, 1999, Groundwater Resources Association of California.

Jacobs, J. and Bertucci, P. ed., 1998, *Geology and Hydrogeology of Northern San Francisco Bay Area*, Groundwater Resources Association of California 7th Annual Meeting Field Trip Guidebook, October, 1998.



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Jacobs, J., 1998, Private Land Recycling -A New Approach to Brownfields, Hydrovisions, Spring, 1998, Groundwater Resources Association of California.

Jacobs, J., Baker, S. and Stewart, R., 1998, Implications of Nationwide Policy Changes in Environmental Regulations, American Institute of Professional Geologists, January, 1998 p. 6-8.

Jacobs, J., 1996, Passive Oxygen Barrier for Groundwater, Hydrovisions, January/February, 1996, Groundwater Resources Association of California.

Jacobs, J., 1996, Spotlight on a new technology: January 1996, American Institute of Professional Geologists; Northern California Section Newsletter, p. 1, January, 1996.

Jacobs, J. and Loo, W., 1994, Direct Push Technology-Site Evaluation and Remediation Technologies without the use of Hollow Stem Auger Rigs, American Institute of Prof. Geologists California Section Newsletter, p. 4-6, July, 1994.

Jacobs, J. and Loo, W., 1994, Direct Push Technology Methods for Site Evaluation and *In-Situ* Remediation, Hydrovisions, July/August, 1994, Groundwater Resources Association of California.

Jacobs, J. and Loo, W., 1994, DPT Technology Opens New Remediation Avenues, ECON Mag., p. 36-37, December.

Jacobs, J., 1985, Fluvial Responses to Hydrologic Changes on the Red River in Northeast Texas; Transactions of the Gulf Coast Association of Geologic Societies, Austin, Texas, pp. 409-414.

Jacobs, J., 1981, Depositional and Quaternary History of the Red River in Northeast Texas, M.A. Thesis, University of Texas at Austin, 1981.

Jacobs, J., McCormick, O., and Gilmore, 1981, Exploration Model for Archeology Sites on the Red River in Northeast Texas, 23<sup>rd</sup> Annual Meeting of the Caddo Conference, March 13-14, 1981, University of Oklahoma, Abstracts.

Jacobs, J. 1980, Geomorphology of the Red River from Texarkana to Lake Texoma, in Red River Archaeology Project, ed. K. Gilmore and O. McCormick, pp. 70-90. Denton, Texas: Institute of Applied Sciences.

Kram, M., Lieberman, S., and Jacobs, J., 2000, Direct Sensing Technologies, Standard Encyclopedia of Environmental Science and Technology, J. Lehr, ed., McGraw Hill, New York, NY; p. 11.124 – 11.150.

Phillips, J.K. and Jacobs, J., 2000, The Impact of Global Positioning Systems on Groundwater Resources, *Hydrovisions*, Fall, 2000, Groundwater Resources Association of California, Vol. 9, No. 3.

Testa, S.M., and Jacobs, J.A., 2002, The Remediation of Hazardous Wastes from Oil Well Drilling, Handbook of Complex Environmental Remediation Problems, McGraw-Hill Handbooks Series, J. Lehr, ed., John Wiley & Sons, New York, NY; Chpt. 8, p. 8.1-8.56.

Testa, S.M., and Jacobs, J.A., 2002, Oil Spills and Leaks, Handbook of Complex Environmental Remediation Problems, eds. Lehr, J., Hyman, M., Gass, T.E., and SeEVERS, W.J., McGraw-Hill Handbooks, New York, NY; Chpt. 9, p. 9.1-9.85.

Testa, S.M., and Jacobs, J.A., 2000, Geological Principles, Standard Encyclopedia of Environmental Science and Technology, J. Lehr, ed., McGraw Hill, New York, NY, Chapter 3; p. 3.1 – 3.30.

#### **Abstracts and Presentations**

Jacobs, J.A., 2018, Diverse Settings for Natural and Anthropogenic Pyrite Oxidation and Selected Mitigation Strategies; Proceedings of the 28<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, San Diego, California, March 19-22, Abstracts, p. 51.



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- Jacobs, O.P., and Jacobs, J.A., O'Neill, H., and Schneider, R., 2018, Unintentional Discharges of Industrial Compounds into and out of Sanitary or Stormwater Drainage Systems in Urban Settings; Proceedings of the 28<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, San Diego, California, March 19-22, Abstracts, p. 86.
- Jacobs, J.A., and Jacobs, O.P., 2017, What Geologists Know about Sewer Systems that Plumbers Don't: Vapor Intrusion into Indoor Air and the Sewer-Plumbing System; Proceedings of the 54<sup>th</sup> Annual American Institute of Professional Geologists National Meeting, Nashville, Tennessee, September 23-26, Abstracts.
- Jacobs, O.P., Jacobs, J.A., and Pennell, K.G., 2016, Exposure Pathway Analysis Using Passive Diffusion Air Sampling Method to Sample Sewer Air in Manholes and Cleanouts; Proceedings of the 26th Annual International Conference, Association for Environmental Health and Sciences, San Diego, California, March 21-24, Abstracts.
- Jacobs, J.A., and Jacobs, O.P., 2015, Geologists' Role in Evaluating VOCs from Illegal Drug Labs, Industrial Wastes and Household Cleaners in Sewer Air; Proceedings of the 52<sup>nd</sup> Annual American Institute of Professional Geologists National Meeting, Anchorage, Alaska, September 19-22, Abstracts, p. 38-39.
- Jacobs, J.A., Jacobs, O.P., and Pennell, K.G., 2015, Updating Site Conceptual Models for Potential Sewer Gas and Vapor Intrusion Into Indoor Air From Breached Sewer Conveyance Systems; Proceedings of the 25th Annual International Conference, Association for Environmental Health and Sciences, San Diego, California, March 23-26, Abstracts, p. 93.
- Jacobs, J.A., Jacobs, O.P., and Pennell, K.G., 2014, Geologists and Site Conceptual Models: VOCs and Sewer Gas in Indoor Air Resulting from Migration from Breached Sewer Conveyance Systems; Proceedings of the 51<sup>st</sup> Annual American Institute of Professional Geologists National Meeting, Prescott, AZ, September 13-16, Abstracts, p. 73-74.
- Jacobs, J.A., and Testa, S.M., 2014, Comprehensive Rethinking of Wastes from Mine Sites into Resources; Proceedings of the 24th Annual International Conference, Association for Environmental Health and Sciences Foundation, March 17-20, San Diego, California, Abstracts.
- Jacobs, J.A., 2014, Recent Trends and Prevention for a Significant Occupational Hazard for Scientists and Engineers and Other Field Workers: *Coccidioidomycosis*: (Valley Fever); Proceedings of the 24<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, March 17-20, San Diego, California, Abstracts.
- Jacobs, J.A., and Testa, S.M., 2013, The Geologist's Role in Comprehensive Rethinking of Wastes from Mine Sites into Resources; Proceedings of the 50<sup>th</sup> Annual American Institute of Professional Geologists Meeting, October 24-25, Broomfield, Colorado, Abstracts.
- Jacobs, J.A., 2013, Recent Trends and Prevention for a Significant Occupational Hazard for Scientists and Engineers and Other Field Workers: *Coccidioidomycosis*: (Valley Fever); Proceedings of the 50<sup>th</sup> Annual American Institute of Professional Geologists Meeting, October 24-25, Broomfield, Colorado, Abstracts.
- Jacobs, J.A., and Testa, S.M., 2012, Sustainable Remediation and Green Resource Extraction Practices of Acid Mine Drainage Sites; Proceedings of the Sierra Fund, Reclaiming the Sierra: Green Solutions to Abandoned Mines, May 3-5, Abstracts, p. 11.
- Jacobs, J.A., and Testa, S.M., 2011, Two Metals Treatments for Soil, Sludges and Water using Green Remediation Criteria; Proceedings of the 48<sup>th</sup> Annual American Institute of Professional Geologists Meeting, September 10-14, Bloomfield, Illinois, Abstracts.
- Jacobs, J.A., Archibald, J., and Drury, D., 2011, Sustainable Water Treatment Practices for Blue Green Algae Blooms to Restore Lakes and Reservoirs; Proceedings of the 48<sup>th</sup> Annual American Institute of Professional Geologists Meeting, September 10-14, Bloomfield, Illinois, Abstracts.

Jacobs, J., Adini, A., and Rau, D. 2010, Revisiting a Closed Site: Expedited Treatability Testing and High Pressure



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Injection of Activated Sodium Persulfate to Move Site toward Closure, Again; Proceedings of the 20<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, March 15-18, San Diego, California, Abstracts.

Jacobs, J., and Testa, S., 2010, Comparison of Two Metals Treatment Technologies in Soil, Sludges and Water: 1990-2010; Proceedings of the 20<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, March 17-20, San Diego, California, Abstracts.

Jacobs, J., and Elam, J., 2010, Improving Water Quality by Reducing Pharmaceutical and Residential Wastes, Managing Resources and Preventing Contamination; Proceedings of the 20<sup>th</sup> Annual International Conference, Association for Environmental Health and Sciences, March 17-20, San Diego, California, Abstracts.

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Jacobs, J. and von Wedel, R., 1997, Enhanced In Situ Biodegradation Via High Pressure Injection of Oxygenating Agents and Nutrients; Proceedings of the 34<sup>th</sup> Annual National American Institute of Professional Geologists Meeting, Houston, Texas, Abstracts, p. 27.

Jacobs, J., 1995, Vertical and Horizontal Direct Push Technology and *In-Situ* Remediation Delivery Systems; Proceedings of the 1995 Annual Meeting, Groundwater Resources Association of California, Sacramento, California; October 6, Abstracts, p. 59.

Jacobs, J., 1994, Overview of Site Evaluation and *In-Situ* Remediation Technologies by Direct Penetration Method; Proceedings of the 1994 Annual Meeting, Groundwater Resources Association of California, Napa, California; September 29, Abstracts.

Jacobs, J., 1992, Environmental Assessments of Oil and Gas Fields; Proceedings of the Annual American Association of Petroleum Landman 1992 West Coast Symposium, Santa Barbara, Abstracts, 36 p.

Jacobs, J., Traver, R., and Jacobs, O., 1991, Environmental Investigations and Remediations of Oil and Gas Fields, Proceedings of the Annual American Association of Petroleum Geologists Meeting, Dallas, Texas, AAPG Bulletin, April, Abstracts, p. 601.

Jacobs, J., and Davis, P., 1990, Environmental Liability and the Oil and Gas Prospector; Proceedings of the Annual American Association of Petroleum Geologists Meeting, San Francisco, California, AAPG Bulletin, June, Abstracts.

Jacobs, J., 1985, Fluvial Responses to Hydrologic Changes on the Red River in Northeast Texas; Proceedings of the Gulf Coast Association of Geologic Societies, AAPG Bulletin, Austin, Texas, October; Abstracts, p. 1424.

Jacobs, J., McCormick, O., and Gilmore, 1981, Exploration Model for Archaeology Sites on the Red River in Northeast Texas; Proceedings of the 23<sup>rd</sup> Annual Meeting of the Caddo Conference, March 13-14, University of Oklahoma, Abstracts.

Nikas, J., and Jacobs, J., 1990, Observations Made in the Marina District of San Francisco After the Northern California Earthquake of 1989; Proceedings of the Annual American Association of Petroleum Geologists Meeting, San Francisco, CA, AAPG Bulletin, June, Abstracts.

Popkin, B., and Jacobs, J., 2007, When Inaction or Limited Action is the Best Action for Hazwaste Site Cleanups-MONA; Proceedings of the National Academy of Certified Hazardous Materials Managers Meeting, August 12-15, Arlington, Virginia, Abstracts.

von Wedel, R., and Jacobs, J., 2000, Overview of Aerobic Bioremediation and Future Development Potential; Proceedings of the 2000 Annual Association of Engineering Geologists-Groundwater Resources Association of California Meeting, San Jose, Abstracts, p. 118.

### **Encyclopedia Entries**

Wiley Encyclopedia of Water, Science, Technology, and Science, including co-author of 31 articles, 2020, 5-volumes, April, 1<sup>st</sup> Edition, Wiley, Hoboken, NJ., 2,976 pages, online version available December 2019.

32. Jacobs, J.A., 2020, Organic Compounds Present at Minute Concentrations in the Hydrologic System, p. 359.
73. Vance, D.B., and Jacobs, J.A., 2020, Low-Flow Groundwater Purging and Sampling, p. 841.
74. Jacobs, J.A., 2020, Water-Jetting Drilling Technologies, p. 845.
75. Jacobs, J.A., 2020, Water Well Drilling Methods, p. 849.
77. Jacobs, J.A., 2020, Cadmium in Groundwater: Chemical Behavior and Treatment, p. 873.
78. Jacobs, J.A., 2020, Construction Sites: Storm water Impacts from Runoff Water, p. 883.
79. Jacobs, J.A., 2020, Soil and Groundwater Sampling Methods, p. 887.
80. Jacobs, J.A., 2020, MtBE: Environmental Impacts, p. 893.



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81. Jacobs, J.A. and Mohr, T.K.G., 2020, Xenobiotic Chemicals: Emerging Contaminants and Recalcitrant Compounds in Groundwater, p. 897.
82. Jacobs, J.A. and Vance, D.B., 2020, Remediation of Metals in Groundwater, p. 903.
83. Vance, D.B., and Jacobs, J.A., 2020, Groundwater Remediation by Injection, p. 909.
84. Jacobs, J.A., 2020, Benzene in Groundwater: Chemical Behavior and Treatment, p. 913.
85. Vance, D.B., and Jacobs, J.A., 2020, In Situ Aeration and Volatilization of Petroleum Hydrocarbons in Groundwater, p. 917.
86. Jacobs, J.A. and Vance, D.B., 2020, Groundwater Remediation and Horizontal Wells, p. 925.
87. Vance, D.B., and Jacobs, J.A., 2020, Arsenic in Groundwater: Chemical Behavior and Treatment, p. 929.
88. Jacobs, J.A., 2020, Life Cycle for Groundwater Remediation Projects, p. 937.
89. Jacobs, J.A., 2020, Uranium in Groundwater: Chemical Behavior and Treatment, p. 941.
90. Jacobs, J.A., 2020, Nitrate in Groundwater: Chemical Behavior and Treatment, p. 945.
91. Jacobs, J.A., 2020, Vinyl Chloride in Groundwater: Chemical Behavior and Treatment, p. 949.
92. Jacobs, J.A., 2020, Lead in Groundwater: Chemical Behavior and Treatment, p. 957.
93. Jacobs, J.A., 2020, Mercury in Groundwater: Chemical Behavior and Treatment, p. 963.
94. Vance, D.B., and Jacobs, J.A., 2020, Microbes and Inorganic Colloids in Particulate Transport in Groundwater, p. 969.
95. Jacobs, J.A. and Vance, D.B., 2020, Natural Attenuation and Enhanced Bioremediation of Petroleum Hydrocarbons Geochemical Factors in Groundwater Remediation, p. 973.
96. Jacobs, J.A., 2020, Cobalt in Groundwater: Chemical Behavior and Treatment, p. 979.
97. Jacobs, J.A., 2020, Groundwater and Soil Remediation Using Fenton's Chemistry, p. 985.
98. Vance, D.B., and Jacobs, J.A., 2020, Phytoremediation Enhancement of Natural Attenuation Processes, p. 989.
99. Vance, D.B., and Jacobs, J.A., 2020, In Situ Bioremediation of Groundwater: Process Limitations, p. 993.
100. Hartman, B. and Jacobs, J.A., 2020, Soil Vapor Data: Groundwater Applications, p. 1001.
101. Jacobs, J.A., 2020, In Situ Remediation of Heavy Metals in Groundwater, p. 1011.
102. Jacobs, J.A., 2020, Groundwater Remediation: In Situ Passive Methods, p. 1017.
223. Vance, D.B., and Jacobs, J.A., 2020, Remediation and Case Closure Policy for Petroleum Hydrocarbons, p. 2639.

#### **Encyclopedia of Petroleum Geoscience**

Jacobs, J.A. and Testa, S.M., (in press), Environmental Issues of the Shale Revolution, in *Encyclopedia of Petroleum Geoscience*, Ed. R.B. Sorkhabi, Springer.

Jacobs, J.A. and Testa, S.M., (in press), Environmental Aspects of Oil Spills and Gas Leaks in *Encyclopedia of Petroleum Geoscience*, Ed. R.B. Sorkhabi, Springer.

#### **Graduate Classes Taught**

SRTMU: Risk-Based Subsurface Environmental Management and Sustainable Remediation; School of Earth Sciences, Department of Environmental Science, Swami Ramanand Teerth Marathwada University, Nanded, India. Lecture hours: 42; participants: 45 students; Year: 2012; Co-teachers: Chin Man Mok and Stephen Baker; Projects.

GIS: Analysis and Sustainable Remediation of Environmental Resources; Government Institute of Science, Department of Geology, Government Institute of Science, Aurangabad, India. Lecture hours: 16; participants: 30 students; Year: 2012; Co-teachers: Stephen Baker; Lectures.

TUM: Risk-Based Subsurface Environmental Management, Engineering Department, Technical University of Munich, Munich, Germany. Lecture hours: 30; participants: 18 students; Year: December, 2011; Co-teachers: Chin Man Mok, and Ravi Arulanantham; Exams and Projects.

UCBE: X-451: University of California, Berkeley Extension, Berkeley Campus, California: 7 session graduate class: Sustainable Remediation of Soil and Groundwater. Lecture hrs: 32; 8 students; Year: Fall 2011; Exams and Projects.

UCBE: X-451: University of California, Berkeley Extension, San Francisco Campus, California: 7 session graduate class titled Sustainable Remediation of Soil and Groundwater. Lecture hours: 32; participants: 12 students; Year: Spring 2011; Exams and Projects.

UWI – EM643: University of the West Indies, Mona Campus, Jamaica, Geology Department:



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4-week daily graduate class titled Environmental Engineering: Sampling, Assessment and Remediation. The course was a required class for a master's degree in Contaminant Hydrogeology, Environmental Science and Risk Management. Lecture hours: 80; participants: 13 students; Year: March, 2004; Exams and Projects.

#### **University Short Courses Taught**

ACE: Remediation of Contaminated Soils and Groundwater: The California Experience. Engineering Department, Afeka College of Engineering in Tel Aviv, Israel. Lecture hours: 40; participants: 28 students; Year: 2008; Co-teachers: Ravi Arulanantham, Chin Man Mok, and Ami Adini.

UWI: Risked-Based Corrective Action, Risk Assessment, and In-Situ Remediation and Natural Attenuation Processes; Petroleum Corporation of Jamaica and UWI Geology Department, University of the West Indies, Mona Campus (near Kingston, Jamaica). Lecture hours: 24; participants: 35 students; Year: March 2004; Co-teachers: Ravi Arulanantham and Roger Brewer.

UWI: Environmental Sampling and Remediation Workshop; Geology Department, University of the West Indies, Mona Campus (near Kingston, Jamaica). Lecture hours: 8; participants: 15 students; Year: February 2003.

#### **Invited Professional Workshops Taught**

2018, Jacobs, J., Jacobs, O., Beckley, L., and McHugh, T., "Sewer VI: Research, Findings and Practical Implactions," M-F4 Sewer Vapor Intrusion Workshop, 20<sup>th</sup> Annual California Unified Program (CUPA) Training Conference, Burlingame, California, February 5, 2018, Abstracts.

2017, Jacobs, O.P., and Jacobs, J.A., "Dispersal of VOCs; Sewer Air – Sampling Sewer Air – When, Where, How, and Mitigation of VOC-laden Sewer Air," Groundwater Resources Association's Assessment and Remediation of Dry Cleaner Sites Symposium, Concord, California, November 2, 2017, Abstracts.

2017, Jacobs, J.A., and Jacobs, O.P., "Sewer Exfiltration Allowances by Design and Failure," Groundwater Resources Association's Assessment and Remediation of Dry Cleaner Sites Symposium, Concord, California, November 2, 2017, Abstracts.

2016, Jacobs, O.P., Jacobs, J.A., and Pennell, K.G., 2016, "Sanitary Sewer Contaminant Migration Study Manhole to Clean Out: Passive Sewer Air Sampling, Presence of VOCs in Sewer Manhole as a Predictor of VOCs in Sewer Lateral Cleanouts," 18<sup>th</sup> Annual California Unified Program (CUPA) Training Conference, Anaheim, California, February 24, 2016, Abstracts.

2010, "In-Well Stripping/Recirculation and Two-Phase Extraction Methods, Application and Enhancement for Groundwater and Soil Remediation" A four hour Short Course presentation, 20<sup>th</sup> International Conference on Soils, Sediments, Water, and Energy, San Diego, California, March 15-18; Co-teachers: Mehmet Pehlivan and Philip G. Mihopoulos,

2009, "Risked Based Corrective Action (RBCA) Grows Up: Introduction to Environmental Hazard Evaluation and Advanced Approaches for Site Investigations." A four hour Short Course presentation, Association for Environmental Health and Sciences, 2009, International Conference, San Diego, California, Co-teachers: Roger Brewer, and Jason Brodersen.

2009, "Two-Phase Extraction Methods, Application for Groundwater and Soil Remediation" A four hour Short Course presentation, American Institute of Professional Geologists, 2009 National Meeting, Grand Junction, Colorado; Co-teachers: Mehmet Pehlivan.

2008, "Two-Phase Extraction Methods, Application for Groundwater and Soil Remediation" A four hour Short Course presentation, The 6<sup>th</sup> International Conference, Remediation of Chlorinated and Recalcitrant Compound, Monterey, California, May 19-22, Battelle, Columbus, Ohio, Co-teachers: Mehmet Pehlivan.

2006, "Effects of Climate Change on Development, Infrastructure, Water Resources Management And Business Opportunities in California, Lorman Educational Services, San Francisco, California, June 23, 198 p. Jacobs organized the short-course,



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invited the speakers and presented the introductory lecture: “Climate Changes: What We Know, What We Don’t Know.”  
Speakers included: James Jacobs, Stephen Baker, Peter Mesard, Jeff Nelson, Kent Alm and Charles McGlashan.

### **Post Graduate and Professional Courses Completed**

#### **Environmental Science**

Environmental Forensics: Applications and Advances in Fingerprinting Techniques to Evaluate Who Was Responsible for a Spill or Release of Organic Contaminants into the Environment, P. Philp, AEHS, Mission Valley, San Diego, California, March 20, 2018.

Classic and Emerging Environmental Forensics Techniques and Applications, I. Petrisor, H. Costa, M.J. Wade., J.C. Balouet, and J.L. Caufield, AEHS, Mission Valley, San Diego, California, March 23, 2015.

Ecological Risk Assessment for a Sustainable Environment, University of Massachusetts, 2010

Assessment Design/Professional Experience Panel, University of California, Berkeley Extension, 2010

Estimating Times of Remediation Associated with Monitored Natural Attenuation and Contaminant Source Removal, F. Chappelle and M. Woddowson, AIPG Annual Meeting, Saratoga, NY, October 4, 2004.

GRA Series on Groundwater Contaminants; Investigation and Remediation of Dry Cleaner Release Sites; Sacramento, California, April, 2004.

GRA Series on Groundwater Contaminants; Characterization and Remediation of Recalcitrant and Emerging Contaminants, San Jose, California, June 2002.

GRA Series on Groundwater Contaminants; Hexavalent Chromium in Groundwater, Glendale, California, January 2001.

EPA Presentations: Advances in Innovative Groundwater Remediation Technologies, San Francisco, California, May 1998

GRA: Surface Geophysical Methods, Oakland, California, November 1997

GRA: Phytoremediation Workshop; J. Lehr, Belmont, California, May 1997

RBCA - Risk and Decision Making at Sites; University of California, Riverside Extension, Santa Clara, California, April, 1996

Contaminant Transport in Groundwater; University of California, Berkeley Extension, Berkeley, California, September to December 1994

EPA West Coast Remediation Marketplace and Innovative Technologies: San Francisco, California, November 1994

EPA Symposium on Bioremediation of Hazardous Wastes: Research, Development and Field Evaluations, San Francisco, California, June 1994

Applied Environmental Statistics, Groundwater Resources Association, Concord, California, May, 1994

Applied Bioremediation Technologies, Hazmacon, San Jose, March, 1994

Intro, Contaminant Transport in Groundwater, University of California, Berkeley Extension, Berkeley, California, T. Buscheck, 1994

Groundwater and Soil Remediation: Design, Safety and Permitting, University of California, Berkeley Extension, Berkeley, California, T. Buscheck, 1993

Bioremediation of Hazardous Waste Sites: EPA Technology Transfer, San Francisco, California, 1993

Management Planning for Asbestos, University of California, Berkeley Extension, Berkeley, California, Fall, 1992

RCRA Corrective Action Stabilization Technologies, EPA Technology Transfer, San Francisco, California, 1992

Site Characterization and Remediation; EPA Technology Transfer, San Francisco, 1990

Physical/Chemical Treatment of Hazardous Waste, EPA Technology Transfer, San Francisco, California, 1990

Federal Environmental Regulations, Rice University, Houston, J. Blackburn, 1989

Building Inspection for Asbestos, University of California, Berkeley, 1989

Fundamentals of Groundwater Hydrology, University of California, Berkeley Extension, G. Aguiar, 1985

Groundwater Contamination, University of California, Davis, F. McLaren, 1985

#### **Petroleum Economics**

Economics Basics, SOHIO Petroleum Co., T. Gazulus, April 6, 1984

Advanced Economics Seminar, SOHIO Petroleum Co., J. Campbell, Oct 30 – November 1, 1984

Economic Evaluation of Petroleum Exploration and Development Projects, IHRDC, N.W. Miller, April 11-15, 1988

#### **Petrophysical and Geophysical Tools**

Petroleum Overview Class; SOHIO Petroleum Co., Various Instructors, October 19-23, 1981

Log Interpretation #1; Schlumberger, F. Bettis, October 1-4, 1981

Log Interpretation #2; Schlumberger, F. Bettis, November 3-4, 1981

Well Logging, Gearhart, Various Instructors, December 15-20, 1982

Geophysics for Geologists, Geoquest, N. Neidell, July 12-16, 1982



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Drilling Practices, Preston Moore, P. Moore, Sept 13-24, 1982  
Seismic Stratigraphy, AAPG, L.F. Brown and R. Buffler, December 12-18, 1983  
Seismic Interpretation, Colorado School of Mines, T. Davis, March 5-9, 1984

#### **Advanced Geology and Oil Prospecting**

Petroleum Geochemistry; Oil and Gas Consultants, C. Barker, May 17-21, 1982  
Modern Clastic Depositional Environments, AAPG/RPI, M. Hayes and W.J. Sexton, April 6-12, 1982  
Core Evaluation, Core Laboratories, Various Instructors, December 5, 1982  
Structural Geology, AAPG, W.A. Brown, June 6-14, 1983  
Ancient Terrigenous Clastics, Colorado School of Mines, R. Weimer, August 27-31, 1984  
Sedimentary Basins, Tectan, J. Dewey and W. Pitman, April 23-25, 1985  
Turbidites in Sedimentation, Northern California Geological Society, T. Nilsen, May 3-4, 1985  
Modern Carbonate Environments, University of Miami, R. Ginsberg, July 8-15, 1985  
Northern California Field Seminar, Crouch & Bachman, J. Crouch and S. Bachman, 1986  
Creativity in Exploration; J. Elam, Houston, TX, April 16, 1986

#### **Other Training**

Required Ethics AB1234 (Brown Act) Compliance Training (CSDA), March 14, 2019 and every 2 years back to 2002  
Sexual Harassment Prevention Training 2019 (CSDA), March 13, 2019  
General Manager Evaluations, California Special District Association (CSDA), February 8, 2017  
Advanced Technical Writing, SOHIO Petroleum Co., C. Cheney, June 5-7, 1984  
Making Professional Presentations, Checkpoint Productions, C. Cheney, May 10-12, 1983  
Effective Technical Writing, Checkpoint Productions, C. Cheney, October 25-27, 1982  
Innovative Problem Solving, Synectics, J. Prince, October 9-11, 1984