RESUMÉ

BAHMAN SHEIKH, PH.D., P.E.

Water Resources and Water Recycling Specialist

Distinguished Fellow, Center for Integrated Water Research, University of California, Santa Cruz

http://www.bahmansheikh.com ♦ Bahman.sheikh@gmail.com

EXPERIENCE SUMMARY

Bahman Sheikh has over 25 years of international experience in research, planning, and design of water resources and sanitation projects, specializing in water conservation, reclamation, reuse, and recycling. His career began in academia, followed by consulting assignments involving technical investigations, planning, design, and project management, department management, and direction of the work of numerous project managers, including service in the public sector with analysis, planning and implementation of public policy programs. He has served clients in 21 countries, including Australia, Bonaire, Korea, Peru, Mexico, Jordan, Egypt, Kuwait, UAE, Saudi Arabia, Syria, Bahrain, Morocco, and Tunisia.

Bahman Sheikh has extensive experience in all aspects of water reclamation, recycling, and reuse, including the technical and regulatory issues, program management, alternatives analysis, feasibility studies, and planning for long-term development of water recycling in communities. He conceived, planned, and conducted major long-term pilot studies of pioneering water recycling programs in Monterey County, California, and in the City of Los Angeles.

Bahman Sheikh is a member of the Research Advisory Board of the National Water Research Institute. He served on the Board of Directors of WateReuse Association and WateReuse Foundation. Highlights of Bahman Sheikhôs specialized experience are briefly listed below:

Domestic	International
City of San José, California—1997 to Date • Provided expert consulting services during the early phases of development of the South Bay Water Recycling (SBWR) infrastructure, in collaboration with the City of Santa Clara. • Created a mathematical model for projecting the economic impact of salinity increases in recycled water due to industrial brine discharges into the City sewers upon the customers of recycled water. • Provides ongoing training for hundreds of newly assigned site supervisors for customers receiving recycled water from the SBWR network. • Conducted site investigations in response to recycled water customersô concerns about water quality and landscape impacts.	**Barwon Water, Victoria, Australia** • 2010-Date, Serving as member of expert panel independently evaluating planning efforts toward an indirect potable reuse project to be implemented as part of a multi-pronged approach to future water supply security for the region. **Australian National Environmental Protection Council Service Corporation** • Peer reviewed draft of the Australian National Guidelines for Water Recycling **Tunisia, Transfer of Recycled Water from Tunis to Southern Tunisia** • 2009, Provided guidelines and case studies of similar transfers over long distances for use in irrigation, industry, and geothermal fields re-

Domestic

- Reviewed and critiqued another consultantôs study of impacts of recycled water on Santa Clara and Llagas Groundwater subbasins, with special emphasis on NDMA fate and transport.

Santa Clara Valley Water District—2000 to Date

- Prepared a computational model to assess the impact of irrigation with recycled water over the unconfined aquifers in Santa Clara Valley, with special emphasis on salinity.
- Facilitated discussions between the District and the City of San Jose (SBWR) regarding future form of collaboration between the two agencies for delivery of recycled water to their service areas. A forty-year agreement for joint development and operations resulted from the success of these negotiations.
- Currently, facilitating discussions between the District and the City regarding their respective operational responsibilities for the advanced recycled water treatment facility (ARWTF) currently under constructionð resulting in another milestone agreement between these agencies.

City of Chula Vista—2002

- Investigated the feasibility and comparative costs and benefits of a large number of water demand management options, including residential water conservation, commercial and industrial measures to reduce demand, use of gray water for landscape irrigation, and water recycling.

Marin Municipal Water District—2001

- Investigated the comparative costs and benefits of alternative sources of water supply for the District including use of gray water, water recycling and desalination of seawater from the San Francisco Bay or from the Pacific Ocean.

City of Los Angeles, California—1991-1996

- Developed achievable goals for recycled water development that were adopted by the City Council. Provided inter-departmental liaison that enabled planning and ultimate implementation of several major water recycling projects in cooperation with West Basin Municipal Water District. Prepared policy analysis for control of salt discharges from residential water

International

plenishment.

- 2007, Guided a group of Jordanian engineers in site visits to wastewater treatment plants in various parts of Tunisia, with an emphasis on beneficial uses of reclaimed water.

Amman, Jordan (Subcontract with various USAID contractors)

- 2008, through DAI, ñWater Efficiency Recommendations for High Rise and High Density Developmentsò in the Greater Amman Municipality, developing best management practices (BMPs) for water reuse and conservation.
- 2005, through Chemonics, ñReview of Aqaba Watger Demand and Expanded Evaluation of Water Resources.ò
- 2004, through ARD, Facilitated discussion workshops for members of Water Reuse Standards Committee from the Ministry of Water and Irrigation, Ministry of Health, and the Jordanian Institute for Standards and Metrology. These workshop sessions led to formulation of recommended water reuse standards for adoption by the government of Jordan.

King Saud University, Riyadh, Saudi Arabia—2006-Date

- Retained as Senior Advisor to Prince Khaled Chair for Water Research at the Department of Civil Engineering.
- Provides periodic workshops and seminars to graduate students and government officials on sustainable water policies and practices

Arriyadh Development Authority (ADA)

- 2000. Sheikh created a master plan for water, wastewater and reclaimed water for the City of Riyadh, Saudi Arabia, for the period to 2022 at which time the Cityôs population would increase by 7,000,000 people.
- 2007. Assisted ADA in development of terms of reference (TOR) for bidding for implementation of water reclamation facilities (treatment, distribution, and retrofits) throughout the rapidly developing areas of the City of Riyadh.
- 2009. Oversaw and reviewed work products of contractors retained to prepare water recycling facilities plan for the City of Riyadh

Domestic

softeners into the municipal sewer system. Commissioned a city-wide survey of water softener use and salt purchase patterns of residents. Recommended adoption of an ordinance for prohibition of use of self-regenerating water softeners, which involve discharge of salts and wastage of water as brine is periodically discharged into the sewers during the regeneration cycles.

- Conducted a year-long graywater reuse pilot project at eight residential locations throughout the City of Los Angeles with monthly monitoring of soils, water, and vegetation for microbicl, chemical and other characteristics.

Monterey Wastewater Reclamation Study for Agriculture—1975-1986

- Managed $7.2 million research and demonstration project on irrigation of raw-eaten vegetables with recycled water, for over eleven years.
- Planned scientific design of field experiments to distinguish any impacts of use of reclaimed water on plants, soils, crop yield, crop quality, groundwater, and the environment.
- Published reports of findings and obtained the agreement of public health officials to permit use of the reclaimed water on raw-eaten food crops.
- Performed liaison and facilitation services among stakeholders, including farmers, public health officials, water supply agencies, and other environmental and citizen groups

West/Central Basin Municipal Water Districts—1986-1988

- Provided technical input into the Districtsô extensive water reuse activities, analyzing alternatives, feasibility, economic viability, and funding of numerous projects.
- Participated in Districtsô public outreach functions, promoting recycled water use
- Prepared the Districtôs Urban Water Management Plan
- Conducted technical sessions for potential new customers of recycled waterð golf courses, nurseries, parks, industries.

WateReuse Association

- Co-chair of the International Committee, working to expand the reach of the Association into

International

Kuwait Institute for Scientific Research

- 2008, Prepared recommendations for updating of Kuwaitôs regulations and criteria for use of reclaimed water in agriculture, landscape irrigation, industry, and groundwater recharge.

United Stated Agency for International Development

- 2006, through CDM and PA Consulting: Assisted local staffs in the cities of Nagpur and Hyderabad, India, to develop industrial water recycling and reuse programs, beginning with pilot treatment systems.
- 2003, through ARD: Developed a new framework for ñStandards, Regulations, and Legislation for Water Reuseò in Jordan.
- 2004, through CDM: Prepared Chapter 8 of the USEPA/USAID Water Reuse Manual, describing international water reuse practices.
- 2003, through Chemonics: Reviewed Egyptian proposed rules for use of reclaimed water in agriculture.
- 2004, through PA Consulting: Reviewed a master plan for a swap of agricultural water with urban reclaimed water in the metropolitan Hyderabad, in the state of Andra Pradesh, India.

German Government Development and Export Fund (KFW)

- 2003, through Dorsch Consult. Provided expertise for the design of a water reclamation and reuse treatment and distribution infrastructure for the Greater Gaza City, Palestinian Territory.
- 2005, through Dorsch Consult. Provided specialized engineering services for the design of an efficient irrigation system using recycled water for landscaping in hotels and government buildings on the Island of **Bonaire**, in the Netherland Antilles.

The World Bank—2001

- Prepared an extensive background document and proceedings and provided technical resource to a regional water reuse workshop for 10 countries of the Middle East and North Africa (MENA) in Cairo, Egypt.

Jaffna Peninsula, Sri Lanka--1983

- Studied the potential for water conservation in

Domestic	International
the Middle East region. • Completed a White Paper on Graywater for the Association Board of Directorsô policy decision vis-à-vis inclusion of graywater in the Association portfolio. • Completed a national training manual for site supervisors and users of recycled water. • Prepared and updated summary of Title 22 ñallowed uses of recycled waterò. • Served as chairman of Public Education Committee. • Collaborated in the preparation of an interactive compact disc for landscape users of recycled water for problem-solving and design of new landscaped irrigated with recycled water. • Served on the video committeeð ñWater In An Endless Loopò. • Prepared popular brochure on Graywaterð ñClear Facts about Gray Waterò. **Author of "Terra Linda Demonstration Garden for Recycled Water-Irrigated Landscapes in Marin County", for Marin Municipal Water District, June 2010** **Author of "White Paper on Graywater", a Policy Analysis for WateReuse Association Board of Directors, April 2010** **Author of "Site Supervisor Training Manual: for Users of Reclaimed Water", September 2006** **Principal Author of Chapter 6 on Public Education in AWWA/WEF Potable Reuse Book** • Collaborated with 13 contributors to the Chapter content to provide a manual, complete with examples of cases and lessons learned from water reuse ongoing projects. **Principal Author of Chapter 17 in "Wastewater Reclamation and Reuse"** • Collaborated with three co-authors, documenting the results of the eleven-year pilot study investigating the safety of use of recycled water for irrigation of food crops in Monterey County, California.	urban and agricultural areas of Jaffna Peninsula and recommended the most cost-effective methods for reducing demand for water, especially during the low-rainfall seasons. **Casablanca, Morocco. Use of Treated Wastewater Effluent for Irrigation of Early-Season Vegetables for the European Export Market** • 1990, Prepared economic feasibility analysis of reclaiming wastewater from the Casablanca-Mohammediah areas for use for irrigation of vegetables in the suburban agricultural region, specifically for early-season export to the European market. **Author of Chapter 6 in "Water Reuse for Irrigation" Edited by Valentina Lazarova and Akiça Bahri, CRC, 2005.**

PROFESSIONAL HISTORY

1996-Date **Independent Water Resources and Reuse Consultant**, providing specialized services to public and private clients in their water reclamation projects. Major current and recent clients include USAID, The World Bank, Petroleum Institute of Mexico, Marin Municipal Water District, Metropolitan Water District of Southern California, Coachella Valley Water District, Las Virgenes Municipal Water District, Monterey Regional Water Pollution Control Agency, the City of San Jose South Bay Water Recycling Program, West/Central Basin Municipal Water Districts, Parsons Engineering Science, Harland Bartholomew, Harza Environmental Services, Bechtel International, ARD, Inc., City of Chula Vista, and Central Contra Costa Sanitary District. In addition to numerous projects in California, Bahman Sheikh serves clients with water reclamation projects in various countries, including the Netherland Antilles (Bonaire), Jordan, Kuwait, Saudi Arabia, Bahrain, Turkey, Peru, Tunisia, Morocco, and Egypt.

1994-1996 **West Basin and Central Basin Municipal Water Districts. Water Resources and Wastewater Reuse Policy Specialist.** In this capacity he advised the Districtsô management on water policy issues, represented the Districts at various State forums, interfaced with regulatory agencies, environmental groups, community organizations, and the public, and worked with water customers and member utilities to solve issues and problems arising as the District expanded its water reclamation service area. Representing the Districts, Bahman Sheikh served on a number of Statewide committees working to manage the Stateôs water resources more efficiently, e. g.:

- U.S. Bureau of Reclamation Executive Management Committee, overseeing the preparation of the ñSouthern California Comprehensive Water Reclamation and Reuse Studyò with federal-local partnerships.
- State Potable Reuse Committee, convened by the Directors of the State Department of Water Resources and the State Department of Health Services to develop and foster regulatory and public acceptance for safe augmentation of potable water supplies with potable reclaimed water.
- Chair, Public Education Committee of WateReuse Association of California, planning and implementing public information and outreach programs on water reuse for the Association.

1989-1994 **City of Los Angeles. Executive Director, Office of Water Reclamation.** This Office was created within the Board of Public Works to bring into focus the Cityôs basic goal of maximizing the reclamation of its wastewater resource. The City recognized the need for new water policy directions because of the increasing vulnerability of its sources of imported water supply. Bahman Sheikh was recruited to set near- and long-term water reclamation goals, bring together diverse decision-making bodies, help establish funding mechanisms, be a good-will ambassador to the public and to outside agencies, and prepare plans and strategies to achieve the Cityôs basic goal. Policy analysis, legislative recommendations, funding and financing, interagency coordination, and interdepartmental liaison were important aspects of Bahman Sheikhôs responsibilities.

Specific goals recommended by Bahman Sheikh were adopted as City goals by the Council and by the Board of Water and Power Commissioners. Based on these adopted goals, a number of water reclamation projects have been developed and are now being implemented. An important function of the Office was coordinating the water reuse activities of the major water purveyor (LADWP) and wastewater management entity (Department of Public Works) in the City, and establishing an outreach program to make the public aware of the safety and desirability of water reuse in all its forms. He designed and directed a yearlong pilot project demonstrating the safety of using gray water systems for residential landscape irrigation. The results of this pilot project were the technical basis for new regulations adopted Statewide for residential gray water use. He provided testimony at numerous local and State hearings before a variety of boards regarding reclaimed water policy.

The Office of Water Reclamation worked closely with the Mayorôs Office, the City Council, and the Boards of Commissioners of Public Works and Water and Power. Examples of initiatives presented to policy makers were the gray water legalization policy and ordinances to control water softeners and to require dual plumbing in all new high-rise construction. The resultant policies caused implementation of several water reclamation projects. Bahman Sheikh represented the City of Los Angeles at numerous statewide water forums, including the following:

- Chair, Regulatory Committee of the WateReuse Association of California, working with State Department of Health Services to revise regulations governing water reuse.
- Member, Bay Delta Oversight Council (BDOC) Technical Advisory Committee on Water Supply.
- Chair, Survey Committee of the WateReuse Association of California. Prepared the 1993 estimate of Statewide water reuse potential in cooperation with the State Department of Water Resources, Metropolitan Water District of Southern California, San Diego County Water Authority, and numerous other retail and wholesale water purveyors.
- Member, California Ad-Hoc Gray Water Committee. Prepared Appendix J to the State Plumbing Code to allow individuals to use gray water in residences, under special restrictions, to protect the public health and prevent backflow into the community water supply.
- Member, DWR/DOHS-sponsored committee to develop dual plumbing standards for reclaimed water service inside high-rise buildings for toilet flushing and other non-potable water uses.
- Member, Legislative Committee of WateReuse Association of California, preparing and supporting legislation to facilitate and expand uses of reclaimed water in the State.
- Member, U.S. Bureau of Reclamation Executive Management Team for the Southern California Comprehensive Water Reclamation and Reuse Study.

1987-1989 **CH2M HILL. Civil/Environmental Engineer.** Directed and managed major water reuse projects and contributed senior review and specialized expertise

to the firmôs water supply and reclamation projects. Examples of his contributions include:

- **City of Ankara, Turkey:** participated in developing a master sewerage plan for the capital City of Ankara, Turkey, population 4 million, where he directed the modeling of the wastewater collection system for the entire City.
- **City of Los Angeles:** Participated in the preparation of the Cityôs Advanced Planning Report by leading the water supply shortfall projections and analyses that resulted in recommendations for full utilization of the Cityôs reclaimed water potential. The Cityôs APR provides for wastewater management planning for the next 100 years and the Cityôs needs for major wastewater and water reclamation infrastructure facilities.
- **City of Santa Rosa:** Analyzed nutrient balance in two basins proposed to receive reclaimed water for irrigation of fodder crops.
- **San Jose/Santa Clara Treatment Plant:** Analyzed opportunities for reclamation of the effluent from the plant and recommended a phased approach including irrigation of parks, industrial cooling, recharge into groundwater aquifers, and dilution of Leslie Salt Companyôs bittern before discharge.

1970-1987 **PARSONS Engineering-Science. Manager.** He was Project Director and oversaw the work of several project managers and engineers performing assignments on a variety of environmental engineering projects for diverse private and public sector clients. His projects are briefly highlighted below:

- **Areawide Water and Sewerage Master Plans:** Managed comprehensive areawide water and sewerage planning studies for mountainous, desert, and metropolitan areas of San Bernardino, Napa, and El Dorado Counties under a Farmers Home Administration planning grant program.
- **Monterey Regional Water Pollution Control Agency:** Bahman Sheikh was responsible for the conception, direction, and execution of the 11-year pilot field demonstration project for Monterey Regional Water Pollution Control Agency, investigating the feasibility of irrigating raw-eaten food crops with disinfected, tertiary-treated reclaimed water. This project, known as the Monterey Wastewater Reclamation Study for Agriculture (MWRSA), attracted worldwide interest and has been reported at many conferences and professional publications. Bahman Sheikh led MWRSA from its inception in 1976 continuously through the publication of its final report in April 1987. His effective communication of the technical intricacies of water reuse to the local farmers, local health authorities, and a score of different governmental agencies was crucial to the successful completion of the project. Large-scale irrigation with recycled water on 12,000 acres in the northern Monterey County is now routine, thanks in part to the success of MWRSA, credibility of its results, and the need for sources of additional water supply in the region.
- **Northglenn-Denver, Colorado:** Performed a water exchange study for Northglenn, Colorado, investigating use of reclaimed Denver wastewater for irrigation of sugar beets in exchange for rights to ditch waters to be diverted for municipal supply.

- **Las Palmas Ranch, Salinas, California:** Directed the evaluation of various irrigation systems, including drip irrigation, for application on a 60-acre hillside for reuse of treated municipal effluent from Las Palmas Ranch, a proposed housing development near Salinas, California.
- **Environmental Impact Studies:** Was responsible for development of Environmental Impact Reports and Statements on a variety of projects including land application of effluents and wastewater biosolids, solid waste disposal, and wastewater treatment. Bahman Sheikh performed erosion, sediment transport, irrigation, and urban runoff investigations as part of a comprehensive water quality management study of the James River Basin in Virginia.

1967-1970 **University of Shirz, Assistant Professor.** Bahman Sheikh taught technical courses in water systems design, water resources and supply management, water utility administration, irrigation, soils, hydrology and hydraulics at the University of Shiraz, College of Agriculture (in Iran). He designed and supervised construction of a hydraulics teaching and research laboratory at the field campus of the College.

ACADEMIC ACTIVITIES

In recent years, Bahman Sheikh has taught classesð as guest lecturer and seminar presenterð in topics related to California water, at several institutions of higher learning, including:

- Department of Civil & Environmental Engineering, Woods Institute for the Environment, Stanford University
- Department of Civil Engineering University of California, Davis
- Public Policy Program at Pomona College
- School of Architecture at the University of Southern California
- Environmental Engineering Program at the University of Southern California
- Environmental Engineering at California State University at Long Beach
- Occidental College Faculty Seminar
- Extension Service of the University of California at Davis, Courses in Legal and Regulatory Water Issues
- Water Resources Short Course at UCLA for Water Officials of the Government of Thailand

INTERNATIONAL CONSULTING:

Over the past two decades, Bahman Sheikh has completed numerous overseas missions of varying duration. Typically, he provides expert and specialized consulting services in water resource management, wastewater treatment, water reuse and related topics, to governmental agencies in countries including Mexico, Peru, South Korea, Sri Lanka, Turkey, Syria, Bahrain, Tunisia, Morocco, and most recently in India, Egypt, Jordan, Kuwait, United Arab Emirates, and Saudi Arabia. Funding agencies for these projects are the World Bank, USAID, Asia Development Bank, and the local government agencies.

EDUCATION

1967, Ph.D., Soil Physics (Soil-Water Relations), University of California, Davis
1964, M.S., Irrigation (Water Science and Engineering), University of California, Davis
1962, Pomona College (Interdisciplinary Studies in Liberal Arts), Claremont, CA
1957, B.Sc., Agricultural Engineering, American University of Beirut, Lebanon

AWARDS AND HONORS

Resolution of Appreciation in recognition of 27 years of service from Board of Directors, Monterey Regional Water Pollution control Agency, March 29, 2004.
Outstanding Service Award, WateReuse Association, 2002
Presidentôs Award of Appreciation, WateReuse Association, 2002
Appointed to the Board of Directors of WateReuse Research Foundation, 2001, served until 12/2007.
Appointed to the Research Advisory Board of National Water Research Institute, 1995.
Recognized by City of Los Angeles City Council for ñefforts and accomplishments,ò 1994
Recognized by City of Los Angeles Board of Public Works for ñvision and commitment,ò 1994
Elected to Board of Directors, WateReuse Association, 1993, served until 2002.
Integrated Resource Management Award, Water Policy Conference III, 1993
Outstanding Service Award, WateReuse Association of California, 1991

REGISTRATION

Professional Engineer, Civil, California: C 26633

PROFESSIONAL MEMBERSHIPS

WateReuse Association
American Water Works Association
Water Environment Federation
California Water Pollution Control Association
National Water Research Institute, Research Advisory Board

PUBLICATIONS AND PRESENTATIONS:

ñGraywaterôs Future Role in Integrated Water Management Planningò, Scheduled for presentation at the IWA Efficient 2011 conference at Dead Sea, Jordan, March, 2011.

ñIs Graywater Another Flavor of Water Reuse?ò, Presented at WateReuse Association Symposium 25, Washington, D. C., September 2010.

ñTerra Linda Demonstration Garden for Recycled Water-Irrigated Landscapes in Marin Countyò, prepared for Marin Municipal Water District, June 2010.

ñGraywater White Paperò, prepared for WateReuse Association Board of Directors, April 2010.

ñMaximizing Filtration Capacity for Production of Tertiary Recycled Waterò, presented at WateReuse Association Symposium 24, Seattle, Washington, September 2009.

ñRecycled Waterð Fit for the Useò, presented at WEFTEC 2008 Workshop on Water Reclamation and Reuse: The Big Picture: Reclaimed Water as a Water Resource, Chicago, Illinois, October 18, 2008.

ñFuture Potential for Recycled Waterò, presented at WateReuse Association Symposium 22, Tampa, Florida, September 2007.

ñSocioeconomic Aspects of Wastewater Treatment and Water Reuseò, presented at EMWater (**E**fficient **M**anagement of **W**astewater) Regional Conference in Amman, Jordan, October 2006.

ñHigher Filter Loading Rates for Greater Water Reuse Capacityò, presented at WEFTEC 06, Dallas, Texas, October 2006

ñNational Training Manual for Commercial Recycled Water Usersò, presented at the 21st Annual WateReuse Association Symposium, Hollywood, California, September 2006.

ñA Scientific Basis for Regulating Filter Loading Rate for Production of Recycled Water in Californiaò, presented at the 21st Annual WateReuse Association Symposium, Hollywood, California, September 2006.

with Ken Tanji, ñA Landscape Guide For Irrigation With Recycled Waterò, presented at the 21st Annual WateReuse Association Symposium, Hollywood, California, September 2006.

ñSite Supervisor Training Manual: for Users of Reclaimed Waterò, prepared for and published by WateReuse Association, September 2006.

ñU.S. and International Perspectives on Recycled Water Disinfectionò, presented at the 2006 California Section Annual Conference, Bridging the Gap with Recycled Water, March 12-14, 2006, San Francisco.

ñFilter Loading Evaluation for Water Reuseò Presented at WateReuse Association California Section 2005 Annual Conference in San Diego on February 28, 2005.

ñInstitutional Requirements in California and Florida for Implementation of Water Recycling/Reclamation Projectsò, Presented at WateReuse Symposium XIX, Phoenix, Arizona, September 21, 2004.

ñWater Reuse: International Perspectives and Rationale for Hyderabadò, presented at Confederation of Indian Industry, Hyderabad, India, September 14, 2004.

ñWater Recycling Projects in California: Opportunities and Challengesò, presented at 2004 Annual Conference of Victorian Farmers Federation in Melbourne, Australia, July 14, 2004

ñImpact of Institutional Requirements on Implementation of Water Recycling / Reclamation Projectsò, presented at the 2004 Water Sources Conference in Austin, Texas, January 11-14, 2004.

"Indirect Potable Reuse through Groundwater Recharge and Surface Water Augmentation: The Gold Standard of Water Recycling in California", invited keynote presentation at the National Water Recycling in Australia Conference, September 1-2, 2003, Brisbane, Australia.

ñEfficacy of Pathogen Removal at Full-Scale Operational Water Reuse Facilities in Monterey, Californiaò, presentation at WateReuse Symposium XVIII, September 7-10, 2003, San Antonio, Texas.

ñRules and Regulations/Guidelines for Water Reuseò Presentation at MED-REUNET Seminar, September 25-26, 2003, Izmir, Turkey.

ñWater Reclamation World-Wide: Revisions to the International Guidelinesò, presented to Third World Water Forum, USAID-Sponsored Session on Update of Water Reuse Guidelines, March 16, 2003, Kyoto, Japan.

ñEthical Dilemmas in the Water Cycle in the Middle East and North Africaò presented to Third World Water Forum, San Francisco Public Utilities Commission-Sponsored Session on Ethics in Water Management, March 19, 2003, Kyoto, Japan.

ñComparing and Contrasting Benefits and Costs of Water Use Efficiency Measures in Marin County and in Chula Vista", presented at CALFED Science Conference, January 2003, Sacramento, California.

ñComparing the Costs and Benefits of Water Recycling Options with Seawater Desalination and Gray Waterò, presented September 10, 2002, at WateReuse Association Symposium XVII, Orlando, Florida.

ñEconomic Impacts of Salt from Industrial and Residential Sourcesò, presented at AWWA-WEF Joint Water Resources Conference, ñReuse, Resources, Conservationò, January 2002, Las Vegas, Nevada.

ñBuilding Water Conservation into New Homes in Chula Vista, Californiaò, presented at AWWA-WEF Joint Water Resources Conference, ñReuse, Resources, Conservationò, January 2002, Las Vegas, Nevada.

ñReclaimed Water: Benefits to Society Beyond Water Resource Value In Dry Regions of the Worldò, presented to The First International Conference on Economical and Social Uses of Water in Arab Countries, June 18-21, 2001, Beirut, Lebanon.

with Anderson, J. *et al.*, ñClimbing the Ladder: A Step-by-Step Approach to International Guidelines for Water Recyclingò presented at the 1st World Congress of the International Water Association (IWA), Paris, France, July 3, 2000.

ñSalt in Recycled Water: Agricultural and Landscape Limitationsò, presented at WateReuse Workshop on Salts In the Brine Stream, held in Phoenix, Arizona, March 29, 2000.

ñRiyadh, Kingdom of Saudi Arabia: A Vision of 2021: Introducing Water Reuse to A World Capitalò, Presented to Water Reuse 2000, Joint AWWA-WEF Specialty Conference to be held in San Antonio, Texas, January 30-February 2, 2000.

ñThe Importance of Reclaimed Water for Landscape Irrigation in the Arid Zoneò, keynote address to the First International Conference on Greenery and Environmental Beautification in Arid Zonesò, Sponsored by Kuwait Institute for Scientific Research, Kuwait City, November 20-24, 1999.

ñLessons From Abroad: Water Recycling Global Perspectivesò, presented at Symposium XIV WateReuse Association, Long Beach, California, September 15, 1999.

with NWRI writing team, ñThe Value of Water: Recognizing and Using the Full Potential of Your Water Supplyò, National Water Research Institute, Fountain Valley, California April 1999

ñSustainable Use of Water, California Success Storiesò, Advisory Committee Member to Pacific Institute for Studies in Development, Environment, and Security, Oakland, January 1999

ñHygienic Evaluation of Reclaimed Water Used To Irrigate Food Cropsð A Case Studyò, Conference Proceedings, Advanced Wastewater Treatment, Recycling and Reuse, 2nd International Conference, IAWQ, Milan, Italy, September 14-16, 1998.

ñTertiary Water Food Safety Studyò, report to the Monterey County Water Recycling Projectsô Water Quality and Operations Committee, August, 1998.

ñAccounting for All the Benefits of Water Recyclingò with Eric Rosenblum, Steve Kasower and Earle Hartling, Proceedings, Water Reuse ð98, a joint specialty conference of WEF and AWWA in Orlando, Florida, February 1-4, 1998.

Chapter 6, Public Information Programs, in joint publication of WEF and AWWA, ñUsing Reclaimed Water to Augment Potable Water Resourcesò, pp. 191-233, February 1998.

Chapter 17, Tertiary Reclaimed Water for Irrigation of Raw-Eaten Vegetables, in ñReuse of Wastewaterò edited by Prof. Takashi Asano, pp. 779-825, June 1998

ñResolving Water Quality Concerns In Irrigation of Pebble Beach Golf Course Greens with Recycled Waterò, in Proceedings of the Water Environment Federation 70th Annual Conference (WEFTECð97), pp. 187-194, Chicago, Illinois, October 18-22, 1997.

ñInternational Practices In Water Reuseò, in Proceedings of the Water Environment Federation 70th Annual Conference (WEFTECð97), pp. 281-284, Chicago, Illinois, October 18-22, 1997.

with Brock McEwen of CH2MHill and Tom Richardson of Montgomery Watson, ñIndirect Potable Reuse: State of the Artò, presented to the Water Environment Federation Specialty Conference on Beneficial Reuse of Water and Biosolids, Marbella, Spain, April 6-9, 1997.

ñAn Informed Public Favors Water Recyclingò presented to the Florida Section/AWWA Specialty Conference, Maitland, Florida, November 13-15, 1996.

with Eric Rosenblum, City of San Jose South Bay Water Recycling, ñEnvironmental Influences behind Water reclamationò presented to the Florida Section/AWWA Specialty conference, Maitland, Florida, November 13-15, 1996.

ñA Preview of the WEF/AWWA Guidance Manual on the Use of Reclaimed Water to Augment Potable Water Resourcesò, presented to WEFTEC'96, Water Environment Federation 69th Annual Conference, Dallas, Texas, October 5-9, 1996.

ñGlobal Perspectives on Water Reuseò , presented to the Pacific Northwest Pollution Control Association, Seattle, Washington, May 17, 1996.

ñObstacles of Reuse Customers and their Resolutionò, presented to the Pacific Northwest Pollution Control Association, Seattle, Washington, May 17, 1996.

ñOutreach and Public Education for Water Reuseò presented to Water Reuse '96 a special conference co-sponsored by WEF and AWWA, San Diego, February 25, 1996.

ñThe Monterey Studyð Agronomic Issuesò, presented to the California Irrigation Institute's 34th Annual Meeting, Sacramento, California, February 2, 1996.

ñUses of Recycled Water: Opportunities and Obstaclesò, presented to the '95 Statewide Conference of the Association of Environmental Professionals, San Jose, California, July 15, 1995.

OWR NEWS, quarterly newsletter of the City of Los Angeles Office of Water Reclamation, was published regularly from 1990 through 1994, to communicate with City decision makers and the public, expanding public awareness of water recycling through dissemination of news and general information about the safety and necessity of uses of reclaimed water.

ñFuture Water Recycling Potential in Southern California,ò presented to the American Society of Civil Engineers Annual Meeting in Denver, May 23-26, 1994.

ñStatus of Present and Future Water Recycling in California,ò presented to the Joint AWWA/WEF Water Reuse Symposium, Dallas, Texas, February 27-March 2, 1994.

with James M. Kelly and Ronald E. Young, ñEmergence of Microbial Risk Assessment as a Criterion in Regulating Water Reuse in California,ò presented to the Joint AWWA/WEF Water Reuse Symposium, Dallas, Texas, February 27-March 2, 1994.

ñThe City of Los Angeles Gray Water Pilot Project,ò presented at CONSERV93, co-sponsored by ASCE, AWWA, and AWRA, Las Vegas, Nevada, December 12-16, 1993.

ñBack to the Future: Water Reclamation,ò panel participant at California Water Policy III: Beyond Consensus conference, Los Angeles, October 21-22, 1993.

ñDirect Potable Reuse,ò Moderator of Panel of Experts at California Water Policy III: Beyond Consensus conference, Los Angeles, October 21-22, 1993.

ñSurvey of Future Water Recycling Potential in California,ò presented to the WateReuse Association of California Symposium VIII, San Diego, California, October 13-15, 1993.

ñResults of the City of Los Angeles Gray Water Pilot Project,ò presented to the AWWA Annual Conference and Exposition, San Antonio, Texas, June 6-10, 1993.

ñThe City of Los Angeles Gray Water Pilot Project Shows Safe Use of Gray Water Is Possible,ò presented to the ASCE Water Resources Planning and Management Division's 20th Anniversary Conference, Seattle, Washington, May 3-5, 1993.

ñRemoving Institutional Barriers to Water Reuse: A Three-Year Report Card,ò presented to the AWWA-WEF Joint Management Conference, Atlanta, Georgia, March 2, 1993.

ñWater Reuse in Los Angeles,ò presented to Water Reuse Symposium, sponsored by Salt River Project, Phoenix, Arizona, November 2, 1992.

ñLong-Range Planning for Water Reuse in the City of Los Angeles,ò in Wastewater Reclamation and Reuse, Water Science and Technology 24:9, pp. 11-17. Proceedings of International Symposium on Wastewater Reclamation and Reuse, Castell dôAro, Costa Brava, Spain, September 24-26, 1991.

ñPlanning for Water Reuse to Meet the Growth Needs of the 21st Century for the City of Los Angeles,ò Water Pollution Control Federation Conference, October 1990, Washington, D.C.

ñMonterey Wastewater Reclamation Study for Agriculture,ò Research Journal, WPCF, 62:3:216-226, May-June 1990.

ñUse of Wastewater Effluent for Irrigation of Raw Eaten Vegetables: A Five-Year Field Experiment Concludes It Is Feasible, Safe and Economical,ò presented at Water Pollution Control Federation Annual Convention, Philadelphia, Pennsylvania, October 1987.

With R.G. Burau, ñReclaimed Water for Irrigation of Vegetables Eaten Raw,ò California Agriculture 41:7 and 8, pp. 4-7, July-August 1987.

ñWastewater Effluent Reuse for Irrigation of Raw-Eaten Food Crops: A Five-Year Field Study,ò presented at Water Reuse Symposium III, San Diego, California, August 1984.

ñReused Tertiary Municipal Wastewater Effluent for Irrigation of Raw-Eaten Crops: A Five-Year Study,ò presented at ñWater for the 21st Century: Will It Be There?ò, a symposium sponsored by Southern Methodist University, Dallas, Texas, April 1984.

ñReused Tertiary Municipal Wastewater Effluent for Irrigation of Raw-Eaten Crops: A Five-Year Study,ò presented to the California Water Pollution Control Association Water Reuse Seminar, Emeryville, California. February 1984.

ñTreated Sewage for Crop Irrigation,ò presented to the Engineering Foundationôs Conference on Environmental and Energy Engineering in the Food Processing Industry XIV, Santa Barbara, California, February 1984.

ñPossibilities for Reuse of Reclaimed Wastewater for the Hashemite Kingdom of Jordan,ò presented to the Jordanian Society of Engineers, Amman, Jordan, January 1984.

ñMonterey Agricultural Demonstration Project ð MWRSA,ò presented at California Association of Reclamation Entities of Water (CAREW) Conference, Santa Barbara, California, June 1980.

ñReclaimed Wastewater for Food Crop Irrigation,ò presented at National Conference on Environmental Engineering, American Society of Civil Engineers, San Francisco, California, July 1979.

ñAerosol Generation in Sprinkler Irrigation,ò Proceedings, Water Reuse Symposium, American Water Works Association Research Foundation, Washington, D.C., March 1979.

ñFood Crop Irrigation with Reclaimed Municipal Wastewater,ò Proceedings, Water Reuse Symposium, American Water Works Association Research Foundation, Washington, D.C., March 1979.