

Roy L. Herndon

Mr. Herndon has over twenty years professional experience in hydrogeologic investigations pertaining to environmental and water supply projects. These projects include the delineation of groundwater contaminant plumes over several miles long, characterization of hydrogeologic systems ranging from one-acre sites to the 350-square-mile Orange County groundwater basin, evaluation and control of sea water intrusion, and design of groundwater recharge and extraction systems for water supply and contamination remediation, respectively.

Mr. Herndon is the chief hydrogeologist at the Orange County Water District and has directed hydrogeologic studies that have collectively entailed the construction of over 100 monitoring wells, 50 of which exceed 1,000 feet in depth. He is responsible for managing and overseeing the OCWD Hydrogeology Department activities that have included the construction of a basin-wide numerical groundwater flow model, development of a comprehensive data management and geographic information system, and design/construction of multidepth monitoring wells and municipal water wells. Mr. Herndon acts as a liaison to state and local regulatory staff in reviewing technical reports submitted by parties performing subsurface environmental investigations. He has given numerous presentations to professional, regulatory, and industrial organizations, served as guest lecturer to university classes, and has been a continuing education program course instructor at the University of California, Irvine.

EDUCATION

M.S., Hydrology and Water Resources (1985), University of Arizona, Tucson
B.A., Geology (1982), Colorado College, Colorado Springs

PROFESSIONAL REGISTRATIONS

California Professional Geologist No. 4817
California Certified Hydrogeologist No. 113

EMPLOYMENT HISTORY

1992 - present: Chief Hydrogeologist, Orange County Water District
1988 - 1992: Project Hydrogeologist, Orange County Water District
1985 - 1988: Project Hydrogeologist, Harding Lawson Associates

ACTIVITIES/MEMBERSHIPS

Chairman, Orange County Well Standards Advisory Board
Director, Groundwater Resources Association of California
Member, South Coast Geological Society
Member, MCAS El Toro Restoration Advisory Board

REPRESENTATIVE PROJECTS

Numerical Groundwater Flow Model of Orange County Groundwater Basin - Directed five-year effort to construct, calibrate, and run future basin management scenarios with a three-layer transient model using MODFLOW.

Regional TCE/TDS/Nitrate Groundwater Contamination Investigation - Managed three-year investigation to determine source and extent of groundwater containing TCE, TDS, and nitrates in Irvine Subbasin; designed/supervised construction of twelve monitoring wells ranging from 150 to 1,300 feet deep; prepared two reports documenting evidence and rationale for conclusion of MCAS El Toro as the source of a four-mile-long TCE plume; member of Technical Review Committee, with U.S. EPA, state DTSC, and RWQCB, which scoped and reviewed Marine Corps' remedial investigation/feasibility study for this federal Superfund site.

Irvine Desalter Project - Developed numerical flow model and designed layout of 7.5-mgd production well field as part of a \$35 million (capital) combined water supply/groundwater remediation facility to remove groundwater containing elevated TDS, nitrate, and TCE; managed construction of six production wells; presented project concept to and negotiated with U.S. Navy for its cost share of TCE cleanup of MCAS El Toro.

Orange County Water Reclamation Project Feasibility Study - Prepared hydrogeologic portion of feasibility study report describing the piezometric and water quality characteristics of the aquifers beneath OCWD's recharge facilities in the city of Anaheim; evaluated the potential for recharging up to 100,000 acre-feet of reclaimed water at these facilities; developed and implemented an ongoing isotopic tracer study with Lawrence Livermore National Laboratory to identify groundwater flow paths and ages from the spreading basins to nearby municipal wells.

City of Orange VOC Study - Managed investigation to identify source(s) and extent of chlorinated VOC contamination that shut down a municipal water well; directed construction of fifteen 100- to 300-foot deep monitoring wells along the three-mile-long plume; prepared final report documenting potential contaminant sources and evaluations of remedial alternatives.

Anaheim/Fullerton VOC Study - Manager of ongoing investigation to identify the source(s) and extent of chlorinated VOC contamination over a 40-square mile area; sited, designed, and directed construction of 60 monitoring wells ranging in depth from 140 to 1,500 feet; prepared report summarizing findings.

Sea Water Intrusion Barrier Management - Technical reviewer of OCWD's Talbert sea water intrusion barrier project operations; directed development of a numerical flow model to assess the impacts to the barrier of a 14-mgd well field proposed by the city of Newport Beach; presented recommended mitigation strategies to minimize drawdown

effects of the well field; Technical reviewer of hydrogeologic portion of Alamitos Barrier Reclamation Project to convert 50% of the injection to reclaimed water.

Santa Ana River Watermaster - Developed storm flow/base flow estimates based on USGS streamflow data; prepared Annual SAR Watermaster Report.

Oak Creek Canyon Water Supply Evaluation - Managed project to determine safe yield of small groundwater basin near Tehachapi, California for cement plant operations; designed and supervised construction and pump testing of two water wells; developed conceptual hydrogeologic and numerical flow models to evaluate maximum yield of basin; prepared final report.

City of Upland Landfill Investigation - Managed SWAT investigation to identify possible groundwater contamination at closed landfill; designed and directed construction of two monitoring wells drilled to depths of 400 to 500 feet; prepared final report for submittal to RWQCB.

Groundwater Salinity Investigation, Laughlin, Nevada - Developed groundwater flow and solute transport model to evaluate the effectiveness of an existing system to extract and contain a high-salinity groundwater plume at a power generating plant; supervised construction of several multidepth monitoring wells to delineate extent of saline plume; participated in seismic refraction and resistivity geophysical surveys to define alluvium/bedrock contact.

Artificial Recharge Feasibility Study, Butler Valley, Arizona - Conducted hydrogeologic investigation of remote desert basin, located along Central Arizona Project aqueduct, to evaluate its potential as a conjunctive-use storage basin; supervised construction of two 600-foot deep monitoring wells; performed aquifer testing and analysis; assisted with seismic and gravity surveys; constructed numerical flow model to estimate maximum basin storage potential; prepared final report.

Petroleum Spill Investigation, Port of Los Angeles - Managed investigation to delineate extent of fuel contamination of soil and groundwater along an abandoned pipeline; concurrent berth modification activities required close coordination with other contractors.

City of Anaheim Groundwater Protection Program - Developed well capture zones using analytical flow model; prepared sections of City well construction/abandonment protocol.

Chemical Distribution Facility Investigation, Santa Fe Springs, California - Prepared subsurface characterization portion of a RI/FS work plan to investigate chlorinated hydrocarbon contamination of vacated facility on the state Superfund list; work plan included construction of numerous monitoring wells and was subsequently accepted by state and local regulatory agencies.

Mr. Herndon has also managed and supervised field activities of numerous underground tank leak investigations throughout southern California; these studies have ranged from initial tank removal and closure to soil and groundwater contamination characterization, remediation, and monitoring.

PUBLICATIONS/PRESENTATIONS

Clark, J.F., Hudson, G.B., Davisson, M.L., Woodside, G., Herndon, R., *Geochemical Imaging of Flow Near an Artificial Recharge Facility, Orange County, California*, Ground Water, Vol. 42, No. 2, March-April 2004.

Herndon, R.L., Woodside, G.D., Davisson, M.L., Hudson, G.B., *Use of Isotopes to Estimate Groundwater Age and Flow Path*, Southwest Hydrology, Vol. 2, No. 1, January/February 2003.

Greblien, V., Ide, C., and Herndon, R., *Alternatives to Adjudications – The OCWD Model*, presented by V. Greblien at CLE California Water Law Conference, Irvine, California, October 17-18, 2002.

Gamlin, J.D., Clark, J.F., Woodside, G., Herndon, R., *Large-Scale Tracing of Ground Water with Sulfur Hexafluoride*, Jour. Of Environ. Engr., February 2001.

Davisson, M.L., Hudson, G.B., Moran, J., Niemeyer, S., Herndon, R., *Isotope Tracer Approaches for Characterizing Artificial Recharge and Demonstrating Regulatory Compliance*, Annual UC Water Reuse Research Conference, Monterey, California, June 1998.

Davisson, M.L., Hudson, G.B., Herndon, R., Niemeyer, S., Beiriger, J., *Report on the Feasibility of Using Isotopes to Source and Age-Date Groundwater in Orange County Water District's Forebay Region, Orange County, California*, Lawrence Livermore National Laboratory ref. #UCRL-ID-123953, May 1996.

Crook, J., Herndon, R.L., Wehner, M.P., and Rigby, M.G., *Studies to Determine the Effects of Injecting 100 Percent Reclaimed Water from Water Factory 21*, Proceedings of Annual Water Environment Federation Conference, Miami, Florida, 1995.

Herndon, R.L., *Hydrogeology of Orange County Groundwater Basin -- An Overview*, in The Regressive Pleistocene Shoreline, Coastal Southern California, Annual Field Trip Guide Book No. 20, Edward G. Heath and W. Lavon Lewis ed., South Coast Geological Society, Inc., 1992.

Hydrogeology of Alamos Gap, Los Angeles and Orange County, California, presented at Association of Engineering Geologists/Groundwater Resources Association annual meeting, Sacramento, California, 1995.

Recycled Water: Conveying the Message to Non-Water Experts, presented as part of a colloquium series hosted by U.C. Berkeley's Water Resources Archives, May 2006.

Two Years Down the Road of Sustainable Groundwater Pumping, presented at Groundwater Resources Association Conference, Pasadena, California, September 2005.

Well, Is There Water or Not? OCWD's 12-Step Program to Recover from Drought, presented for Gen. Mgr. Virginia Grebbien at Groundwater Resources Association Annual Conference, Rohnert Park, California, September 2004.

How Much Can We Pump? Identifying and Overcoming the Limiting Factors of the Orange County Groundwater Basin, presented at Association of Ground Water Scientists and Engineers Annual Conference, Orlando, Florida, December 2003.

Building and Managing a Network of Over 200 Monitoring Wells in Orange County, presented at Water Education Foundation/Association of Groundwater Agencies conference, Ontario, California, April 2002.

Orange County's Groundwater: A Resource Worth Protecting, presented at the California Environmental Law Conference, Yosemite, October 1999.

Hydrogeologic Aspects of Recharging 250,000+ af/year in Orange County, presented at the American Ground Water Trust Workshop "The Latest on Artificial Recharge," Scottsdale, Arizona, September 1999.

Measuring Success of Source Water Protection in Orange County, California, presented at Source Water Assessment and Protection 98 conference, Dallas, Texas, 1998.

Orange County Water District's Hydrogeology and Modeling Objectives, presented at WaterReuse Association of California Groundwater Recharge Workshop, Newport Beach, California, 1997.

An Update on Groundwater Contamination in Orange County – Chlorinated Compounds and MTBE, presented at Groundwater Resources Association Conference, Costa Mesa, California, 1996.

Orange County Water District Groundwater Management Plan: Water Quality and Hydrogeologic Perspectives, presented to ASCE North American Water Environment Congress, Anaheim, California, 1996.

Hydrogeologic Evolution of the Orange County Groundwater Basin, presented at American Association of Petroleum Geologists Cordilleran Section annual meeting, Long Beach, California, 1993.

El Toro TCE Investigation, presented to Association of Hazardous Materials Professionals, Anaheim, California, 1991.

Chlorinated VOC Investigation in Anaheim, California, presented to Association of Engineering Geologists, southern California region, Montebello, California, 1991.

TECHNICAL ADVISORY PANELS

AB303 Grant Program – Served on TAP for California Department of Water Resources to review and comment on grant program structure and subsequent proposals submitted for funding of groundwater monitoring and data management projects throughout the state.

Dana Point Desalination Project – Served on TAP to review and comment on proposed alternatives to construct a slant subsurface extraction well beneath the beach and near-shore seafloor for a potential future seawater desalination project to supply south Orange County, California.

Elsinore Valley Groundwater Management Plan – Served on TAP to review and comment on a groundwater management plan prepared for the Elsinore Valley Municipal Water District.

Georgia Seawater Intrusion – Served on TAP for state of Georgia to review existing seawater intrusion conditions between Hilton Head, South Carolina to Brunswick County, Georgia and recommend potential control alternatives.

Des Moines, Iowa ASR Project – Served on TAP for U.S. EPA-funded feasibility study of aquifer storage and recovery project using existing 2,000-foot wells.