Robert Lewis, PG: Senior Hydrogeologist and Principal

Mr. Lewis is a senior hydrogeologist and Principal of **AQUI-VER, INC.**, providing specialized hydrogeologic and environmental consulting services to mining companies, oil and gas companies, attorneys, water purveyors, private land owners, consultants, and others. Mr. Lewis has over 23 years of experience as a groundwater scientist and environmental consultant. Mr. Lewis has been involved in more than 150 consulting projects and environmental investigations worldwide. He has broad experience, with expertise in the areas of mine hydrology, soil and groundwater contamination investigation and remediation, fate and transport of organic, inorganic, and radiological constituents, groundwater flow and contaminant transport modeling, and water resource development. Mr. Lewis has provided expert witness testimony and litigation support on numerous occasions. He has significant project management experience, and has served as manager in charge of technical and professional development. Mr. Lewis has authored technical papers, peer-reviewed journal articles, and book chapters concerning mine hydrology and water quality, groundwater modeling, and water resource evaluation. He has served as Associate Editor of *Ground Water* journal, and has been a member of ASTM subcommittees D.18.04 (Determination of Hydrogeological Parameters) and D18.21.10 (Ground Water Modeling).

EDUCATION & CERTIFICATIONS

* Certified Professional Geologist, Wyoming, 1991 (#522)
* M.S., Geology (Hydrogeology), Colorado School of Mines, 1988
* B.S., Geology, University of Colorado, Boulder, 1985

ACADEMIC AND PROFESSIONAL HONORS

* Associate Editor, Ground Water Journal (AGWSE/NGWA), 1998-2001
* Association of Ground Water Scientists and Engineers
* ASTM Committee D18, 1997-1998

PROFESSIONAL WORK HISTORY

*	10/2010 - Present	**AQUI-VER, INC**., Golden, Colorado: Senior Hydrogeologist & Principal
*	2001 - 2010	WorleyParsons/Komex, Principal Hydrogeologist, Environmental Manager, Denver - Golden, Colorado
*	1998 - 2001	Independent Consultant - Westminster, Colorado
*	1995 - 1998	Associate Hydrogeologist - Denver, Colorado
*	1991 - 1994	Senior Hydrogeologist - Lakewood, Colorado
*	1990 - 1991	Project Hydrogeologist - Denver, Colorado
*	1988 - 1990	Project Hydrogeologist - Irvine, California
*	1985	Geologist - Boulder, Colorado

EXPERT CONSULTING AND WITNESS SERVICES

Mr. Lewis has been expert witness on behalf of the following parties:

Designated:

* Ongoing Confidential Litigation
  Client: Confidential Public Utility
  Legal Counsel: Perkins Coie LLC
  Court: Waterloo, Iowa

* Plainview Water District v. Exxon Mobil, et al.
  Client: Plainview Water District
  Court: New York Supreme Court (Nassau County)

* PSI Energy v. The Home Insurance Company, et. al. (insurance recovery for environmental damages at six sites in Indiana)
  Client: Cinergy Services, Inc. (PSI Energy)
  Legal Counsel: Howrey, Simon, Arnold & White
  Court: Hendricks County, Indiana

* Consumers Energy, Inc. v. various insurance carriers (insurance recovery for environmental damages at seven sites in Michigan).
  Client: Consumers Energy
  Legal Counsel: Jones, Day, Reavis & Pogue
  Court: Jackson County, Michigan

* Northern Illinois Gas Corporation (NICOR) v. various insurance carriers (insurance recovery for environmental damages at eight sites in Illinois)
  Client: NICOR
  Legal Counsel: Howrey, Simon, Arnold & White
  Court: Illinois District Court

* IES Utilities v. various insurance carriers (insurance recovery for environmental damages at seven sites in Michigan)
  Client: IES Utilities
  Legal Counsel: Howrey, Simon, Arnold & White

* Chesapeake Utilities Corporation v. GPU, Inc. (insurance recovery for environmental damages at former MGP site and dry cleaners in Dover, Delaware)
  Client: Chesapeake Utilities Corp.
  Legal Counsel: Howrey, Simon, Arnold & White

* Wisconsin Gas v. various insurance carriers (insurance recovery for environmental damages at seven sites in Wisconsin)
  Client: Wisconsin Gas
  Legal Counsel: Howrey, Simon, Arnold & White

* Wisconsin Power & Light v. various insurance carriers (insurance recovery for environmental damages at two sites in Wisconsin)
  Client: Wisconsin Power and Light
  Legal Counsel: Howrey, Simon, Arnold & White

* Atlanta Gas v. various insurance carriers (insurance recovery for environmental damages at seven sites in Michigan in Georgia)
  Client: Atlanta Gas
  Legal Counsel: Howrey, Simon, Arnold & White

* Indiana Gas v. various insurance carriers (contamination at multiple MGP sites in Indiana)
  Client: Indiana Gas
  Legal Counsel: Howrey, Simon, Arnold & White

* Mr. Lewis has also served as a consulting expert to law firms and provided technical support to designated and testifying witnesses for cases involving groundwater pollution and water-related property damage in Missouri, California, Illinois, Colorado, and New York.

PROJECT EXPERIENCE

* Served as project manager for pumping test plan preparation, test performance, and technical report preparation at a uranium In-Situ Recovery (ISR) property in northwest Nebraska.
* Provided litigation support and expert witness testimony on behalf of various public utilities and law firms. Work included groundwater flow and transport modeling at more than 50 former Manufactured Gas Plant (MGP) sites in Georgia, Wisconsin, Indiana, Illinois, Iowa, Delaware, and Michigan.
* Served as project manager in charge of Coal Bed Methane Hydrologic Impact Assessment at the North Butte satellite ISR facility.
* Served as project manager for confidential study to develop in-situ groundwater bioremediation methods for heavy metals in groundwater.
* Performed and evaluated pumping test data for new well installation at the BHP Billiton (Rio Algom) Lisbon uranium mill tailings facility in La Sal, Utah.
* Served as primary technical investigator in the evaluation and simulation of aquifer restoration at the Power Resources, Inc. (PRI) ISR uranium mine in Douglas, Wyoming. Work included an evaluation of fate and transport of radiological constituents and heavy

metals via natural attenuation using sophisticated geochemical and hydrologic modeling techniques.

* Served as project manager and primary technical investigator in support of mine restoration plan development for an ISR uranium mine in northwest Nebraska. Work included groundwater modeling and optimization of ISR wellfield restoration plans.
* Provided expert witness testimony and prepared an expert report concerning the probability of structural leakage at five former Manufactured Gas Plant (MGP) sites in Michigan.
* Provided expert witness testimony and prepared an expert report concerning the probability of structural leakage at six former Manufactured Gas Plant (MGP) sites in Indiana.
* Supervised and conducted hydrogeologic investigations in support of a successful solution mining permit application for a large underground copper mine in the Upper Peninsula of Michigan. Performed numerical and analytical groundwater flow modeling to predict the rate of mine filling, and the rate of mine discharge. Models were used to assess the effectiveness of various engineering controls to reduce uncontrolled mine discharge.
* Conducted a third-party review of groundwater quality data at the Minera Yanacocha, SRL gold mine in Cajamarca, Peru – the second largest gold mine in the world.
* Conducted technical review of groundwater flow and contaminant transport modeling and provided strategic recommendations in support of litigation at an operational gold and copper mine in Arizona.
* Supervised and performed CERCLA Preliminary Assessments (PA's) and Site Investigations (SI's) at U.S. Army facilities in Colorado, Utah, and Montana.
* Supervised and conducted groundwater flow and solute transport modeling in support of CERCLA Remedial Investigations/Feasibility Studies (RI/FS) at U.S. DoD facilities in California, Missouri, and Massachusetts. Modeling included detailed conceptual design of remedial well fields for VOC removal and containment. Work included the performance and analysis of aquifer tests at production well locations in support of modeling efforts.
* Managed and performed CERCLA Site Investigations (SIs), Preliminary Assessments (PAs), and Feasibility Studies (FSs) at U.S. DoE and DoD facilities containing high-level and low-level nuclear and radioactive wastes and source materials, including projects at the Dugway Proving Ground (Utah) and the Rocky Flats Plant (Colorado).
* Served as project manager providing restoration plan development support an ISR uranium mine in the Powder River Basin, Wyoming.
* Served as project manager in support of bond surety support and updates for Power Resources, Inc. Highland Uranium Project (HUP).
* Served as project manager and principal investigator in the preparation of an Alternate Concentration Limits (ACL) permit application for the Rio Algom Mining Corporation

(RAMC) uranium mill tailings facility in La Sal, Utah.

* Served as project manager and principal investigator in the preparation of an Alternate Concentration Limits (ACL) permit application for a former uranium mine and mill tailings site in the Shirley Basin, Wyoming.
* Served as primary technical investigator in the preparation of an aquifer restoration cost estimate report for the former Petrotomics uranium mill tailings facility in the Shirley Basin, Wyoming.
* Served as primary investigator and project coordinator in the preparation of a groundwater modeling and ACL feasibility report for the Rio Algom Mining Corporation (RAMC) Lisbon uranium mill in La Sal, Utah.
* Served as primary technical investigator in the evaluation of the groundwater Corrective Action Program (CAP) at the RAMC Lisbon uranium mine and tailings facility.
* Served as project coordinator and technical investigator for a background water quality assessment at the Rio Algom Mining Corporation (RAMC) Lisbon uranium mill facility in La Sal, Utah.
* Prepared an expert opinion report concerning the source of elevated sulfates in shallow groundwater at the Crow Butte Resources (CBR) in-situ leach (ISL) uranium mine in Crawford, Nebraska.
* Conducted technical review and provided recommendations to improve the groundwater Corrective Action Program at a former uranium mine and mill tailings site in the Gas Hills, Wyoming.
* Provided technical oversight and conducted peer-review of transport modeling conducted in support of an ACL application at a former uranium mill tailings site in the Sweetwater River Basin, Wyoming.
* Served as project manager supervising the preparation of a Soil Decommissioning Plan for a former uranium mill tailings site in New Mexico. The facility contained extensive areas of windblown tailings containing radioactive elements and source material. Work included the performance of regional and site-scale radiological surveys, fate and transport assessment, benchmark dose modeling, closure planning, and preparation of a soil remediation plan.
* Performed computer simulations involving the fate and transport of radiological constituents in soil and groundwater in support of citing and permitting of a proposed nuclear reactor in Illinois.
* Conducted three-dimensional groundwater flow and transport modeling of TCE transport at an U.S. Army Depot in Northern California. Modeling was used to assist in the selection of remedial alternatives and the proper location of potable supply wells.
* Supervised and performed numerous remedial investigations and remedial actions at landfills, railroad maintenance facilities, and Underground Storage Tank (UST) sites.

Field investigations involved monitor well installation, soil and groundwater sampling, geophysical surveys, aquifer testing, and soil gas sampling and analysis.

* Designed soil vapor extraction and groundwater sparging remediation system at former petroleum UST site. Design included the performance of in-situ air permeability and aquifer tests.
* Conducted geologic hazard assessment at former U.S. Naval base in northern California. Work included detailed seismic hazard assessment, including mapping of recent faults, computer modeling of strong ground motion, and estimation of liquefaction potential resulting from a hypothetical earthquake with a 50-year return period.
* Conducted and supervised numerous Phase I and Phase II environmental property assessments on behalf of U.S. financial institutions and land developers.

AFFILIATIONS

* National Ground Water Association/Association of Groundwater Engineers and Scientists
* Colorado Ground Water Association
* Geological Society of America (GSA)
* Society of Mining Engineers (SME)

PUBLICATIONS

Mr. Lewis has prepared hundreds of written project reports, and has written, presented and published many articles or presentations regarding the following:

* Groundwater and solute transport modeling
* Mine Hydrology
* Contaminant fate and transport in heterogeneous media
* General water resources and environmental issues

The following is a list of conferences, publications and presentations:

* Schramke, J. A., Lawrence Reiman., James Clay, David Moody, and Lewis, Robert (2011). of Decarbonation, Reductant Addition and Lime Addition on Groundwater Restoration at Uranium In-Situ Reovery Sites in Wyoming and Nebraska, presented at the 2011 Annual Geological Sciences of America (GSA) Conference, Denver, Colorado.

* Lewis, R. L. (2001). Ground Water Resources of South Park, Colorado, in The Colorado Ground-Water Atlas, Chapter 21, pp. 111-116, Colorado Ground Water Association.

* Lewis, R.L. (1999). Predicting the Steady-State Water Quality of Pit Lakes, in Mining Engineering, Society for Mining, Metallurgy, and Exploration (SME), October 1999. SME reprint number 98-28.

* Lewis, R.L., Isobel R. McGowan, Joseph I. Hershman, and Jochen Tilk (1997). Numerical Simulation of Bulkheads to Reduce Uncontrolled Discharge from an Underground Copper Mine, in Mining Engineering, Magazine of the Society for Mining, Metallurgy, and Exploration (SME), April, 1997, pp. 68-72.

* Lewis, R.L., Joseph I. Hershman, and Isobel R. McGowan (1996). Numerical Simulation of Low-Flow Bulkheads to Reduce Uncontrolled Discharge from an Underground Copper Mine, in Proceedings of the Second International Conference on Tailings and Mine Waste, 1996, Fort Collins, Colorado, A. A. Balkema Publishing, pp. 331-340.

* Lewis, R.L., Michael D. Gard, Donald H. Koch, and Dennis W. Bower (1994). Simulation of TCE Transport in a Complex Alluvial Aquifer System: A Case Study Comparison of Two Popular Solute Transport Models, in Proceedings of the 1994 Groundwater Modeling Conference, Colorado State University Press, pp. 287-296.

* Lewis, R.L., Donald H. Koch, Isobel R. McGowan, Craig MacPhee, and Dennis W. Bowser (1993). Remedial Well-Field Design Using MODFLOW and RAND3D, DDRW Sharpe Site, Lathrop, California, in Proceedings of the 1993 Federal Environmental Restoration Conference and Exhibition, Hazardous Materials Control Resources Institute, pp. A17-A18.

* Lewis, R. L. (1988). Late Quaternary Faulting in the Northeastern Tahoe Basin and Northern Carson Range, Nevada, in EOS, Transactions of the American Geophysical Union.

* Lewis, R.L. (1988). Geology, Neotectonics, and Geologic Hazards of the Mount Rose 7.5-Minute Quadrangle, Northern Tahoe Basin, Nevada, Nevada Bureau of Mines and Geology Open File Report.

* Lewis, R.L. (1988). Geologic Map of the Mount Rose 7.5-Minute Quadrangle, Northern Tahoe Basin, Nevada, Nevada Bureau of Mines and Geology Open File Map.

* Lewis, R.L. (1988). Geologic Hazards Map of the Mount Rose 7.5-Minute Quadrangle, Northern Tahoe Basin, Nevada, Nevada Bureau of Mines and Geology Open File Map.

* Schramke, J. A., S. F. Murphy, R. L. Lewis, R. L. Medlock, and M. J. Franko (1997). Natural Attenuation of Ground Water Constituents at a Uranium Mill Tailings Site, Shirley Basin, Wyoming, in Tailings and Mine Waste '97, Balkema Publishing, pp. 499-508.