

## EDUCATION

B.A., Geology, Dartmouth College, New Hampshire, 1985

## PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS

Professional Engineer, Colorado, #33232

Professional Geologist, Wyoming, PG-422

Registered Geologist, Arizona #26038

A.I.P.G. Certified Professional Geologist, #9621

ACEC Certified Expert Witness (#50), 2009 (ground water hydrology, ground water modeling, and ground water rights engineering)

## EXPERIENCE

### **Leonard Rice Engineers, Inc.**

*Principal/Senior Ground Water Section Leader—2008-present*

*Associate—2006-2008*

*Project Manager—2004-2006*

*Project Manager—2000-2001*

*Project Hydrogeologist—1993-1999*

*Staff Hydrogeologist—1990-1992*

*Assistant Geologist—1989*



Responsible for project management and technical performance on projects involving nearly every aspect of evaluating hydrogeologic systems. Expertise includes computer modeling of surface water and ground water interactions to evaluate ground water development and water rights issues. Routinely interpret existing geologic and geophysical logs, geologic and hydrologic maps and water quality data. Field activities include geologic mapping, well installation, and aquifer testing.

### Significant projects include:

- Expert witness for cases involving ground water and surface water interactions in Colorado and Idaho. (See list of cases below).
- Evaluating the feasibility of artificial recharge projects in Colorado and Arizona.
- Evaluating of the aquifer life of the Coconino Aquifer (Arizona) as a 5,000 gpm industrial water source using the U.S.G.S. MODFLOW computer model. Results were used to deepen existing wells and forecast regional ground water impacts.
- Utilizing MODFLOW to evaluate stream depletions caused by ground water pumping for a large hydroelectric facility in Arizona.
- Characterizing the South Platte alluvial aquifer in the vicinity of Brighton using MODFLOW for the purpose of siting additional wells and determining the timing and location of stream depletions.
- Evaluating of the potential yield of a Montana ground water basin for a large industrial facility using MODFLOW.
- Creating a spreadsheet mass balance model of the Phoenix Basin that involves annual surface water/ground water interactions from 1859 - 1998. The database includes inflow and outflow parameters for numerous entities and includes over 200 linked worksheets.

- Designing and observing drilling and testing of several alluvial wells (yielding 150 to 3,000 gpm) and numerous mountain bedrock wells.
- Designing and observing drilling and testing of deep, Denver Basin wells (yielding 150 to 450 gpm).
- Forecasting well yields for Front Range water districts, corporations, and golf courses; recommended well and pump replacement schedules; and designed and supervised installation of wells, pumps, motors, and controls for 1 hp to 175 hp (460 - 2,300 volt) systems.
- Appraisal of decreed ground water rights for numerous Front Range entities.

**Layne-Western Inc., Aurora, Colorado**

*Project Manager—2001-September 2004*

Responsible for all aspects of Contractor project management including well and pumping system design, well testing and interpretation, aquifer evaluation and development, well rehabilitation design and implementation, and construction management.

Significant projects include:

- Design-build of the Saratoga National Fish Hatchery Upgrades that included replacing wells, pumping systems, pipelines, controls; and reprogramming the SCADA system.
- Design-build of the ASLAN Water Districts deep well pumping, control and SCADA system, and discharge piping and metering vaults.
- Design-build of the Tagawa Gardens and City of Fountain alluvial wells and pumping systems.

**Bechtel Civil Inc., San Francisco, California**

*Geologist - 1985-1988*

Field experience included characterization of hazardous waste sites in New York, New Jersey, and Missouri. Contaminants were typically radionuclides and heavy metals. Responsible for borehole drilling, monitoring well installation, soil and water sampling, permeability testing, designing and implementing engineering testing programs, and writing geological reports. Supervised all subcontractor activities.

**PUBLICATIONS**

Determining Stream Depletions in Colorado Using MODFLOW, MODFLOW '98 Conference, Golden, Colorado, October 1998.

Evaluation of the Pagosa Springs Geothermal Reservoir and Implications of Potential Additional Reservoir Development, ASCE Water Resources and Management Conference. Denver, CO, 1994 (w/Jon Ford).

Gila River Recharge Project as an Alternative to Buttes Dam, CONSERV90 National Conference and Exposition. Phoenix, AZ, 1990.

Complementing Radiologic Data with Geology: A Case History, Second Annual International Conference on Case Histories in Geotechnical Engineering. St. Louis, MO, 1988.

**PROFESSIONAL ACTIVITIES**

AWRA (Colorado Section) Board of Directors President-2011, Vice President-2009  
Colorado Ground Water Association  
American Society for Civil Engineers  
Member ASCE Committee on Guidelines for Artificial Recharge of Ground Water

## EXPERT WITNESS EXPERIENCE

CLIENT	CASE #	CASE TITLE	COURT
City of Broomfield	2009CW096	South Platte Wellfield/Wells	Colorado District Water Court – Division 1
City of Broomfield	2008CW163	Plan for Augmentation for the Arapahoe Pit	Colorado District Water Court – Division 1
Rangen Inc.	NOS. 36-02356A, 36-07210, and 36-07427 (Blue Lakes Delivery Call); and NOS. 36-04013A, 3604013B, and 36-07148 (Clear Springs, Snake River Farms Delivery Call)	In the Matter of Distribution of Water to Water Rights, September, 2007	Before the Department of Water Resources of the State of Idaho.
City of Broomfield	2006CW288	Heit Pit Storage and Exchange	Colorado District Water Court – Division 1
Orphan Wells of Wiggins	2004CW84	Concerning the Application for a Plan of Augmentation	Colorado District Water Court – Division 1
Central Water Conservancy District	2001CW258	South Adams County Change, Exchange and Plan for Augmentation	Colorado District Water Court – Division 1

## EXPERT WITNESS REPORTS

### Division 1 Case No. 2008CW163

Leonard Rice Engineers, Inc., September 13, 2010. 2 - Case No. 01CW258. Response to Objector's 26(A)(2) Objector Disclosure for Arapahoe Pit Plan for Augmentation. Prepared with Greg Roush and Jennifer Ashworth.

### Division 1 Case No. 2006CW288

Leonard Rice Engineers Inc., and Miller Groundwater Engineering LLC, June 30, 2009 "Response to Objector's 26(A)(2) Disclosure Statements pertaining to The City and County of Broomfield's 2006CW288 Storage and Exchange Case – Ground Water Related Issues." Expert report to Harvey Curtis and Associates.

Leonard Rice Engineers Inc., and Miller Groundwater Engineering LLC, August 14, 2009 "Response to Objector's Supplemental Expert Disclosures pertaining to Ground Water Issues in the City and County of Broomfield's 2006CW288 Storage and Exchange Case". Expert report to Harvey Curtis and Associates.

**Division 1 Case No. 2004CW084**

Leonard Rice Engineers, Inc., December 6, 2006. Expert Rebuttal to W&EST, Inc. Report – Case No. 2004CW084. (Subject: Rebuttal to Hydrosphere Ground Water Model of OWW site)

Leonard Rice Engineers, Inc., December 6, 2006. Expert Rebuttal to W&EST, Inc. Report – Case No. 2004CW084. (Subject: Rebuttal to W&EST Inc. Ground Water Model of OWW site)

Leonard Rice Engineers, Inc., January 23, 2007. Expert Disclosure – Case No. 2004CW084. (Subject: OWW Pumping Test OWW-4).

Leonard Rice Engineers, Inc., March 6, 2008. Supplemental Expert Disclosure – Case No. 2004CW084. (Subject: Revised Figures 1 and 3 to LRE January 23, 2007 Report.

Leonard Rice Engineers, Inc., March 6, 2008. Supplemental Expert Disclosure – Case No. 2004CW084. (Subject: Alluvial Aquifer properties and Aquifer Clay Distribution).

Leonard Rice Engineers, Inc., March 26, 2008. Supplemental Expert Disclosure – Case No. 2004CW084. (Subject: Response to Objectors).

Leonard Rice Engineers, Inc., August 1, 2008. Supplemental Expert Disclosure – Case No. 2004CW084. (Subject: Interpretation of OWW Pumping Test OWW-1).

Leonard Rice Engineers, Inc., August 14, 2008. Supplemental Expert Disclosure – Case No. 2004CW084. (Subject: Response to Objectors Questions Concerning August 1, 2008 Disclosure).

**Division 1 Case No. 2001CW258**

Leonard Rice Engineers, Inc., May 21, 2010. Opinions concerning SACWSD - Case No. 01CW258. Prepared with Ed Armbruster.

**Idaho Department of Water Resources**

Affidavit before the Idaho Department of Water Resources. Case Numbers: 36-02356A, 36-07210, and 36-07427 (Blue Lakes Delivery Call); and NOS. 36-04013A, 3604013B, and 36-07148 (Clear Springs, Snake River Farm Delivery Call). Subject: Opinions concerning the East Snake Plain Aquifer Model (ESPAM), September 12, 2007.