AGENDA: Uncovering the Hidden Resource: Groundwater Law, Hydrology and Policy in the 1990s

University of Colorado Boulder, Natural Resources Law Center

Rocky Mountain Ground-Water Conference (1992)

Colorado Ground-Water Association

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UNCOVERING THE HIDDEN RESOURCE: GROUNDWATER LAW, HYDROLOGY, AND POLICY IN THE 1990S

Sponsored by
Natural Resources Law Center
University of Colorado School of Law
and the
Rocky Mountain Ground-Water Conference
organized by the
Colorado Ground-Water Association

* Sessions marked with asterisks will be joint.

**Monday, June 15, 1992**

**Morning (Joint Session): Overview of the Resource and the Law**

This session will explain the fundamentals of groundwater hydrology and the legal principles of groundwater allocation and management that have developed in response to each of four examples of groundwater problems.

*8:30 Welcome
Sarah F. Bates, Natural Resources Law Center
Amy Lange, P.E., President, Colorado Ground-Water Association

*8:40 A [Very Brief] Primer on Groundwater Law
Lawrence J. MacDonnell, Natural Resources Law Center

*9:00 Fundamental Groundwater Hydrology and Well Hydraulics
Ed Gutentag, U.S. Geological Survey, Lakewood, Colorado

*9:30 Well-to-well Interference and Groundwater Mining: the Legal Framework
Prof. David Aiken, Dept of Agricultural Economics, University of Nebraska

*10:00 Break

*10:20 Aquifer/Stream Relationships and Aquifer Recharge
Robert Longenbaugh, Professional Engineer, Lakewood, Colorado

*10:50 The Legal Framework for Aquifer Issues
Prof. Douglas Grant, University of Idaho School of Law

*11:20 Discussion
Monday Afternoon (Legal Session): *Case Studies--Issues in Groundwater Development*

The principles of groundwater hydrology and law outlined in the morning session will be illustrated in the context of current groundwater development proposals in Colorado and Nevada.

1:15 *Exporting Groundwater from Colorado’s San Luis Valley: The AWDI Proposal*
Panel:
- Eric Harmon, P.E., Vice President, HRS Water Consultants, Inc., Denver
- Charles B. White, Brownstein, Hyatt, Farber & Madden, Denver
- Steven E. Vandiver, Division III Engineer, Alamosa, Colorado

Discussion and questions

3:00 Break

3:20 *Meeting Urban Water Demands in Nevada: The Las Vegas Proposal*
Panel:
- Terry Katzer, Las Vegas Water District, Nevada
- George Benesch, Benesch & Fermoile, Reno, Nevada
- E. Michael Turnipseed, Nevada State Engineer, Division of Water Resources, Carson City, Nevada

Discussion and questions

5:00 End of day

*6:15 Cookout on Flagstaff Mtn. (must preregister)*

Monday Afternoon (Technical Session): *Groundwater Modeling Issues in Groundwater Development*

This session will explore the technical and legal issues concerning groundwater modeling for groundwater development. Experienced professionals will discuss the technical aspects of model selection, conceptualization, data input, parameter estimation, calibration, verification, sensitivity analysis, and error analysis. Following technical discussions, the speakers will be joined by an experienced water attorney in a panel discussion to examine how these technical issues are often amplified and resolved in a litigation setting.
1:15 Types of Models (Pros and Cons)/ Choosing the Right Model
Paul K.M. van der Heijde, Director, Institute for Ground Water Research and Education, Colorado School of Mines

2:00 Conceptualization, Data Input, and Parameter Estimation
Prof. Ken Kolm, Dept. of Geology and Geological Engineering, Colorado School of Mines

3:00 Break

3:20 Model Calibration and Verification
Paul K.M. van der Heijde

3:55 Sensitivity and Error Analyses
Devraj Sharma, Principia Mathematica, Inc., Lakewood, Colorado

4:30 Panel Discussion
Technical speakers and William Paddock, Attorney, Carlson, Hammond & Paddock, Denver

5:00 End of day

*6:15 Cookout on Flagstaff Mtn. (must preregister); rain location, UMC

Tuesday, June 16, 1992

Morning (Legal Session): Case Studies--Issues in Groundwater Management

Alternative approaches to managing groundwater resources will be explored, including state-coordinated basin management in Arizona and locally-initiated efforts in Southern California. A current controversy over groundwater development and endangered species protection in Texas illustrates the complex pressures facing groundwater managers and users.

8:30 Arizona's Groundwater Management Approach: The Tucson Experience
Prof. Robert Glennon, University of Arizona College of Law
Kathy Jacobs, Tucson Active Management Area, Arizona Department of Water Resources

9:30 Managing Groundwater Quality and Quantity: Comparative Approaches of Southern California Water Basins
Tuesday Morning (Technical Session): Development and Presentation of Technical Evidence

By their very nature, groundwater litigation cases often present unique challenges for groundwater professionals who may be called upon to act as expert witnesses. This session will dive into the nuts and bolts of development and presentation of technical evidence by experienced groundwater professionals. Depositions and oral testimony will be examined by an experienced water attorney. New computer innovations will also be reviewed, which may provide valuable litigation support.

8:30 Data, Correspondence, Reports, and Exhibits for Groundwater Rights Cases

Robert Brogden, Bishop, Brogden Associates, Lakewood

9:10 Data, Correspondence, Reports, and Exhibits for Groundwater Quality/Hazardous Waste Cases

James M. Kerr, Jr. Delta Environmental Consultants, Denver

9:50 Depositions and Oral Testimony

M.E. (Sandy) MacDougall, M.E. MacDougall Law Offices, Colorado Springs

10:30 Break
10:50 New Hardware and Software Innovations  
Prof. Keith Turner, Dept. of Geology and Geological Engineering,  
Colorado School of Mines

11:50 Panel Discussion

12:15 Lunch (on your own)

Tuesday Afternoon (Joint Session): Legal and Technical Practice Issues

Experienced lawyers and groundwater professionals will discuss the legal and technical aspects of case preparation and will simulate an expert witness examination to illustrate how factual questions are developed in a groundwater case. Following the simulation, a water court judge will provide his observations on the use of modeling and expert witnesses in groundwater litigation. Many of the techniques and suggestions discussed in this session will pertain to administrative hearings in other states as well as to Colorado’s water court system.

*1:45 Case preparation: The Lawyer’s Role  
Michael D. Shimmin, Vranesh & Raisch, Boulder

*2:15 Case preparation: The Expert Witness’ Role  
Bruce Kroeker, Ted Zorich & Associates, Inc., Lakewood, Colorado

*2:45 Demonstration: Groundwater Attorney and Expert Witness in Action  
William A. Paddock, Carlson, Hammond & Paddock, Denver  
Dr. Devraj Sharma, Principia Mathematica, Lakewood, Colorado

*2:45 Introduction to the Demonstration

*3:15 Break

*3:35 Demonstration of Direct Examination

*4:30 The View from the Bench: the Perspective of a Water Court Judge  
Robert A. Behrman, District Judge, Division I Water Court,  
Greeley, Colorado

*5:00 Reception, UMC patio
Wednesday, June 17, 1992

Morning and afternoon (Joint Sessions): **Groundwater Quality**

Morning and afternoon sessions will cover the protection of groundwater quality, including the nature of groundwater quality problems and federal and state approaches to prevent groundwater contamination. Two case studies illustrate the difficulties facing local, state, and federal officials attempting to deal with contaminated underground drinking water supplies. The final speaker will provide a critical perspective of the costs and benefits of modern groundwater clean-up approaches.

*8:30*  **Groundwater Contamination: What You Need to Know**

Prof. David McWhorter, Dept of Agricultural and Chemical Engineering, Colorado State University, Fort Collins

*9:10*  **Setting the Standards: Federal Groundwater Protection Programs**

Katharine Teter, Gorsuch, Kirgis, Campbell, Walker & Grover, Denver


Larry Morandi, National Council of State Legislatures, Denver
Paul Frohardt, Water Quality Control Commission, Colorado Dept. of Health, Denver

10:40  Break

**Wednesday (Legal Session) Case Studies of Groundwater Contamination Issues**

11:00  **Quality Meets Quantity: San Gabriel Valley, California**

Background:
Mark Klaiman, Office of Regional Counsel, U.S. EPA, San Francisco

Panel discussion:
Thomas Stetson, Stetson Associates, San Clemente, California
Victor Gleason, Senior Deputy General Counsel, Metropolitan Water District of Southern California, Los Angeles
Mark Klaiman, EPA
Wednesday (Technical Session) Water Quality Modeling

11:00  Transport Modeling: Technical and Legal Issues
       Adrian Brown, Adrian Brown Consultants, Inc., Denver

11:45  Open discussion

12:15  Lunch (on your own)

*1:30  Rocky Mountain Arsenal, Colorado: A Success Story?
       Background:
          Connally E. Mears, Coordinator, Clean Up of Rocky
          Mountain Arsenal, U.S. EPA, Denver
       Panel discussion:
          Scott G. Mefford, Hydrokinetics, moderator
          David M. Brown, Moses, Wittemyer, Harrison & Woodruff,
          Boulder
          Connally E. Mears, EPA
          Lt. Col. Jeffrey Guilford, Chief Counsel, Rocky Mountain
          Arsenal, Denver
          Jacqueline Hernandez Berardini, Office of the Environment,
          Colorado Department of Health

*2:35  Groundwater Clean-up: Is it Worth it?
       Carolyn B. Doty, Policy and Risk Analyst, Automated Sciences
       Group, Inc., Oakridge, Tennessee

3:35  End of program
Uncovering the Hidden Resource:
Groundwater Law, Hydrology and Policy in the 1990s
June 15-17, 1992

Faculty

Prof. David Aiken
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B.A. Hastings College, 1972
J.D. George Washington University, 1975
Has been with the Department of Agricultural Economics at the University of Nebraska since 1975. Has over 100 technical and popular publications on water rights, natural resources, environmental protection, and agricultural law, including Ground Water Mining Law and Policy, and Ground Water Mining and Western Water Rights Law: The Nebraska Experience. Past Chairman of the Natural Resources Section of the Nebraska State Bar Association.

Robert A. Behrman
District Judge
Division I Water Court
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Undergraduate degree, Yale University
Law degree, Harvard Law
Has been since 1978 Water Judge of Colorado Water Division No. 1, which comprises the South Platte and other river basins, covers the entire northeast quarter of Colorado, and includes about 70% of the state's population (Denver, Boulder, Fort Collins, Greeley, Longmont, Loveland, Sterling, Fort Morgan, and Brighton). A heavy trial schedule is maintained.

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B.S. Agricultural Economics, University of Nevada at Reno, 1972
M.S. Resource Economics, University of Nevada at Reno, 1977
J.D. McGeorge School of Law, Univ. of the Pacific, Sacramento, 1982
Was Deputy Attorney General representing the Nevada State Engineer and
Division of Water Resources for 7 years. Currently is counsel for Nevada counties in opposition to numerous large scale water exportation projects: Nye County in opposition to Las Vegas Valley Water District; Lyon County in opposition to the Aqueduct I proposed transfers; Humboldt and Lander Counties in opposition to the Eco-Vision project; and Lassen County, California in opposition to the Honey Lake Basin transfer to Reno.

Jacqueline Hernandez Berardini  
Assistant to the Director  
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Principal responsibilities include cross-media and cross-program integration, strategic planning for risk reduction, oversight of federal facilities, and emergency planning and response. She is the governor's representative to the Western Governors Association WIPP Transport Technical Group and the WGA Western Interstate Energy Board. Previously she was Deputy Attorney General for Colorado's CERCLA Litigation Section, where she was the lead supervising attorney on the Rocky Mountain Arsenal litigation.

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B.S., Geology, University of Nebraska, 1968
M.S., Civil Engineering, University of Nebraska, 1972
Project development and management, 20+ years experience in surface and groundwater projects, work mostly in Colorado and in surrounding states, worked on Nebraska and South Dakota geological surveys and USGS in Colorado.

Adrian Brown
President, Adrian Brown Consultants, Inc.
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Bachelor in Civil Engineering, Monash Univ., Victoria, Australia (1967)
Master of Business Administration, Monash University (1974)
Active technical consultant in ground-water flow and solute transport. Recent activities include direction of ground-water remediation at a number of major Superfund sites, performance of mining hydrology evaluations and dewatering designs, and provision of expert witness testimony in several major ground-water contamination cases.

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B.S. Civil Engineering, University of Illinois, 1973
M.S. Environmental Engineering, Stanford University, 1975
J.D. University of Colorado Law School, 1976
M.B.A. (Executive Program) University of California, Los Angeles, 1990
Acted as special water counsel since 1977 to South Adams Water and Sanitation District, the potentially affected public from Rocky Mountain Arsenal. Forged settlement with U.S. Army, EPA and Colorado Dept. of Health for funding and construction of $12 million Klein Water Treatment Facility to treat contaminants reaching South Adams' alluvial wells from both Arsenal and offpost sources.

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B.A. and M.A. (Zoology), University of Texas at Austin
J.D. with honors, University of Texas Law School
Primary areas of expertise include state water law, state administrative law, state
water pollution law, and the law of interstate compacts. Also, waste disposal, air pollution regulation, noise regulation and environmental impact litigation. He has been Adjunct Professor of Water Law, University of Texas School of Law.

Carolyn Doty  
Policy & Risk Analyst  
Automated Sciences Group, Inc.  
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B.S. and M.S. from the University of Tennessee.  
Oversees risk assessment methodology development and provides technical support to federal agencies in the areas of risk assessment and risk management.  
Recent research at Oak Ridge National Laboratory's Center for Risk Management includes a study of the effectiveness of remedial technologies at hazardous waste sites and a study of cost growth associated with remedial alternatives.

Paul Frohardt  
Administrator  
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Master in Public Policy, Kennedy School of Government at Harvard.  
In 1989 spent nine months establishing and managing an expanded Health Department program monitoring and regulating the Rocky Flats Nuclear Weapons Plant. Previously was a partner with the law firm Holland & Hart, specializing in environmental and water law.

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At the Metropolitan Water District of Southern California works primarily with water resources, including groundwater rights and groundwater conjunctive use. Has represented the district in several groundwater basin water rights adjudications, including the San Gabriel Valley adjudication. Has published

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J.D. Boston College Law School, 1969
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Professor Douglas L. Grant
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J.D. University of Colorado, 1967 (editor-in-chief Law Review)
Prior to entering law teaching, was an associate at Davis, Graham & Stubbs in Denver. Has written a number of law review articles on water law, including several on groundwater. Most recently wrote the chapters on interstate water allocation in the multivolume treatise, Waters and Water Rights (1991 ed.).

Lt. Col. Jeffrey Guilford
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B.A. California State University at Los Angeles
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Current assignment: Chief Counsel, Program Manager for Rocky Mountain Arsenal. Previously Instructor and Chief, Legal Assistance Branch, Administrative and Civil Law Division, The Judge Advocate General's School, Charlottesville, Virginia. (1986-90). Editor (and author of selected sections), Environmental Law
(a correspondence course issued by The Judge Advocate General's School); editor (and author of selected sections), chapter 5, "Environmental Law," Dept of the Army Pamphlet 27-21.

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B.S., Brooklyn College, 1953  
M.S., University of Kansas, 1958  
One of the founders of the Colorado Ground-Water Association. Member of the ASTM committee for developing standards for aquifer test design and interpretation. P.I. for Past Discharge Activity, Quarterly Regional Hydrology Study for Hydrologic Investigations Program, Yucca Mt. Project, Water Resource Division, USGS.

Eric Harmon, P.E.  
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Registered Professional Engineer in Colorado and Wyoming, with degrees in Geophysical Engineering and Hydrogeology, Colorado School of Mines. Has specialized in Colorado and Rocky Mountain West ground-water development issues, with special emphasis on ground-water exploration, wellfield design, pumping interference, conflicting claim, and conjunctive use. Served as Project Manager ('86-87) for an extensive study of the deep ground water resources of the San Luis Valley. During the recent AWDI trial in Alamosa, he testified extensively on the geologic framework of the aquifers of the San Luis Valley on behalf of Colorado Division of Wildlife and the U.S. Dept. of Justice.

Stuart Henry  
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B.A. Economics and Political Science, University of Texas, Austin  
J.D. South Texas College of Law, Houston, emphasis on Urban and Environmental Law  
Air Pollution Control Institute, UCLA, graduate credit in Public Administration of Pollution Control
Private practice of law since 1974, limited to environmental litigation and administrative law. Legal services for clients include: legal counsel for State Sierra Club; recovery of damages for flooding, death of trees, salt water pollution of fresh water, and oil fires and spills; opposition to waste discharge permits, construction of water reservoir projects and dams, water rights, solid waste permits, industrial waste disposal by injection well and air pollution permits.

Katharine L. Jacobs  
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B.A. Middlebury College, Vermont, in biology (1977)  
M.L.A. in Environmental Planning, University of California, Berkeley (1981)  
Has worked for the Arizona Department of Water Resources in several capacities since 1981, and in her position as Director of the Tucson Active Management Area since 1988. Responsibilities include planning, operations, compliance, personnel and budget-related activities, as well as policy development and consensus building in solving water resource management problems. She represents southern Arizona in statewide water issues, and works with community leaders and other agencies to address a variety of local resource problems.

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B.S. Geology, Mackay School of Mines, University of Nevada (1958)  
Graduate study hydrogeology, University of Nevada (1962-64)  
Since 1985 at the Las Vegas Valley Water District he has: initiated and completed a ground-water quality project and artificial recharge feasibility projects; initiated draft legislation to change Nevada ground-water law to recognize and define the administrative process for artificial recharge; initiated and directed major ground-water resource development projects in eastern and southern Nevada.

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M.S. School of Oriental and African Studies, University of London (1985)
J.D. University of Chicago Law School (1988)
Has been with the EPA Region IX Hazardous Waste Division since December 1989, responsible for representing the U.S. EPA in CERCLA removal and remedial enforcement actions, RCRA administrative enforcement actions and permitting matters; staff attorney responsible for regional implementation of Oil Pollution Act. Previously was in private practice concentrating in environmental and toxic tort litigation.

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B.S., Geological Sciences, Lehigh University
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Professional Geologist (AIPG), Registered Hydrogeologist (AIH), Engineer-In-Training (Colorado)
Developed tradework-based conceptual and numerical models of hydrologic systems using Geoscientific Information Systems -- Yucca Mountain, Nevada; San Luis Valley, Colorado; Jackson Hole, Wyoming; Spanish Valley, Utah.

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M.S. Agricultural Engineering, Colorado State University, 1980
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Specializes in the development, management, and protection of water resources. Has assisted clients with projects involving the development of ground water
supplies, assessment and cleanup of ground water contamination incidents, and
interrelationships between ground water and surface water, including numerous
projects associated with litigation and regulatory enforcement orders.

Robert Longenbaugh
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B.S. (1957) & M.S. (1962), Agricultural Engineering, Colorado State University
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19 years teaching, 11 years Assistant State Engineer. Taught and did research and
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B.S., Colorado State University
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Present law practice consists of the following: Water - 30%; Natural Resources
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B.A. University of Michigan (1966)
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Became Director of the Natural Resources Law Center in 1983. Is also adjoint
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Petroleum Engineer, Colorado School of Mines, 1965
M.S., Civil Engineering, Colorado State University, 1966
Ph.D., Agricultural Engineering, Colorado State University, 1971
Teaches graduate level courses in ground-water hydrology, contaminant transport in ground-water, and multi-fluid flow in porous media. Major research is in the area of ground-water contamination by dense nonaqueous phase liquids. Participates on the technical advisory boards (committees) for several large corporations with problems of ground-water contamination.

Connally E. Mears
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B.S. Aerospace Engineering, University of Arizona
M.S. Mechanical Engineering, specializing in air pollution control, University of Kentucky
At EPA Region VIII has directed air pollution compliance evaluations and enforcement actions, specializing in the steel industry. Has evaluated and permitted industrial hazardous waste generation and management activities. Since 1985 has coordinated the cleanup of the Rocky Mountain Arsenal, directing an 11-person EPA team to oversee cleanup activities by the Army and Shell. His team earned EPA's regional and national "Superfund Team of the Year" award in 1991.
Scott G. Mefford  
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In 1983 co-founded Hydrokinetics, Inc., a geotechnical consulting firm specializing in geohydrology, and engineering geology investigations. Senior project manager, working specifically in the areas groundwater contamination, remediation of underground releases of petroleum products, water rights development, well design, and aquifer analysis. Serves in an appointed position on the Lowry Monitor Committee, a governmental commission for the remediation of the Lowry Superfund Site.

Larry Morandi  
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B.A. University of Colorado, 1974  
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Trial attorney representing various state, municipal, agricultural, development and individual interests in water rights adjudications and environmental issues. Attorney for individuals, companies, and municipalities appearing before administrative and permitting agencies with jurisdiction over ground water, surface water and water quality. Previously was First Assistant Attorney General, Water Rights Section, Colorado Attorney General's Office (1982-84).
Devraj Sharma, Ph.D.
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B.S., Madras University, India
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Master of Technology, Indian Institute of Technology
Responsible for development, adaption, calibration, verification and application of
mathematical models of fluid flow, mass and heat transport. In particular, the
application of complex ground-water models, pre- and post-processors to water
resource and ground-water contamination projects. Was involved in the recent
AWDI case in the San Luis Valley; was responsible for ground-water modeling of
the Arkansas River Basin in Kansas v. Colorado currently being conducted before
the U.S. Supreme Court.

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B.A. Colorado State University (1975)
J.D. University of Colorado School of Law (1978)
Practice with Vranesh & Raisch, since 1978, has focused almost exclusively on
water law and water project development, including adjudication of conditional
and absolute water rights, both surface and underground; development,
adjudication, and administration of plans for augmentation, water rights transfers,
and exchange cases; general counsel to four groundwater management districts,
and practice before the Colorado Ground Water Commission.

Tom Stetson
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California licensed civil engineer. President and principal owner of Stetson
Engineers, Inc., a water resources firm with offices in California, and Arizona. Is
one of three Court appointed watermasters which administer the San Gabriel
River Judgment of 1965. Has had long experience as an expert witness in water
rights matters starting with the Arizona v. California case in the 1950s. Is a
member of the Fort Peck-Montana Compact Board, representing the the
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation.
Katharine (Joni) Teter  
Gorsuch, Kirgis, Campbell, Walker and Grover  
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B.A. University of Colorado at Boulder, 1983  
J.D. University of Colorado School of Law, 1986  
Environmental and land use law. Client matters include compliance with the National Environmental Policy Act, Superfund remediation, regulatory permitting under the Clean Air Act, Clean Water Act, Underground Storage Tank program and RCRA. Previously Associate Regional Counsel with U.S. EPA Region VIII, responsible for Superfund mining remediation, and Assistant Regional Counsel, Water and General Law Section.

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