



Natural Resources Consulting Engineers, Inc.
131 Lincoln Ave, Suite 300
Fort Collins, CO 80524
Phone: (970) 224-1851, Fax: (970) 224-1885

Date: November 4, 2008

To: Mr. Bradley Bridgewater, Esq.
United States Department of Justice - Indian Resources Section
Denver, Colorado

From: L. Niel Allen, Ph.D., P.E.

RE: Disclosure of Expert Testimony (Federal Rules of Civil Procedure, Rule 26(a))

In the matter of *United States vs. A&R Productions, et. al. Case # 01cv00072-BB/ACE* Zuni River Basin New Mexico Water Rights Adjudication; L. Niel Allen disclose the following information. The information is submitted along with the a report titled, *Zuni Indian Reservation Identification of Lands and Estimation of Water Requirements for Past and Present Irrigated Lands Served by Permanent Irrigation Works* prepared by L. Niel Allen, Ph.D., P.E. dated November 4, 2008. The report contains opinions and basis for opinions along with data or references to available data used to support opinions. Attached to this disclosure is my resume with qualifications. The disclosure includes reports and publications during the last ten years, and a list of cases the witness testified in during the previous four years.

Reports Prepared during the Last Ten Years

L. Niel Allen prepared or assisted in the preparation of the following reports and declarations. The author(s) of most reports prepared by Natural Resources Consulting Engineers, Inc. are not listed in the report.

New Mexico v. Abbott, Santa Cruz River Adjudication

- Engineering Design and Cost Estimation for the Santa Cruz River Basin Irrigation Project in the San Juan, Santa Clara, San Ildefonso, and Pojoaque Pueblos, New Mexico in the New Mexico v. Abbott Case. Preliminary – Subject to Revision, Natural Resources Consulting Engineers, Inc., April 24, 1997.
- *Diversion and Depletion for Pre-20th Century Irrigation on the San Ildefonso Reservation.* Memorandum to Bradley S. Bridgewater, Esq. dated August 31, 2004.
- *Information in Response to Request from John Stroud, Esq. concerning NRCE's estimate of water use on the San Juan Pueblo.* Memorandum to Bradley S. Bridgewater, Esq. dated July 8, 2008.

- Water Use Rates for San Juan Pueblo for New Mexico v. Abbott. Memorandum to Bradley S. Bridgewater, Esq. dated September 21, 2006.
- Water Use Rates for Santa Clara Pueblo for New Mexico v. Abbott. Memorandum to Bradley S. Bridgewater, Esq. dated February 8, 2008.

New Mexico State Engineer v. Kerr McGee Corporation et al. - Rio San Jose Adjudication

- Summary of Past and Present Water Uses of the Acoma Pueblo - New Mexico State Engineer v. Kerr McGee Corporation et al. Technical Memorandum by L. Niel Allen, Natural Resources Consulting Engineers, Inc., June 27, 2005.

United State of America, State of New Mexico (Plaintiffs), and Zuni Indian Tribe and Navajo Nation (Plaintiffs in Intervention) v. A & R Production, et al. (Defendants) – Zuni River Adjudication

- Zuni River Basin Adjudication Hydrographic Survey Report for Sub Areas 4 and 8, Natural Resources Consulting Engineers, Inc., July 14, 2004.
- Zuni River Basin Adjudication Hydrographic Survey Report for Sub Areas 9 and 10, Natural Resources Consulting Engineers, Inc., October 2005.
- Zuni River Basin Adjudication Hydrographic Survey Report for Sub Area 7, Natural Resources Consulting Engineers, Inc., January 2006.
- Zuni River Basin Adjudication Hydrographic Survey Report for Sub Areas 1 & 2 & 3 Excluding Ramah, Natural Resources Consulting Engineers, Inc., August 2006.
- Zuni River Basin Adjudication Hydrographic Survey Report for Sub-Area Ramah, Natural Resources Consulting Engineers, Inc., January 2007

Fallon Paiute-Shoshone Indian Tribe

- TJ Drain Closure Technical Review and Recommended Closure Plan – Fallon Paiute-Shoshone Reservation, Churchill County, Nevada. Natural Resources Consulting Engineers, Inc. February 10, 2000.

El Sur Ranch, Big Sur, California

- Reasonable Beneficial Use – Land Use Study for El Sur Ranch Irrigated Pastures, Water Right Application No. 30166. Natural Resources Consulting Engineers, Inc. May 18, 2005. Submitted to the California State Water Control Board.
- (Update of May 18, 2005 Report) Reasonable Beneficial Use – Land Use Study for El Sur Ranch Irrigated Pastures, Water Right Application No. 30166. Natural Resources Consulting Engineers, Inc. May 18, 2005.

Imperial Irrigation District Reports, Imperial, California

- System Improvement Study - Imperial Irrigation District, Final Draft. Natural Resources Consulting Engineers, Inc. January 2006.
- Assessment of Imperial Irrigation District's Water Use, Natural Resources Consulting Engineers, Inc., March 2002.

Yakama Nation - State of Washington, Department of Ecology v. James A. Acquavella, et al. case Yakima River Basin Water Rights Adjudication

- Draft - Comprehensive Water Resources Management Plan for the Toppenish and Simcoe Basins Yakama Reservation, Washington. Natural Resources Consulting Engineers, Inc., March 2002.
- Assessment and Review of the Proposed Pine Hollow Reservoir Project near Wiley City and Tampico, Washington. Prepared by Yakama Nation Department of Natural Resources, Natural Resources Consulting Engineers, Inc. Fort Collins, Colorado, D. B. Simons and Associates, Inc. Daryl B. Simons, Ph.D., P.E. Fort Collins, Colorado, and Hardin-Davis, Inc. Tim Hardin, Ph.D., Fisheries Biologist, Corvallis, Oregon. August 31, 1999.
- Priority Irrigation Water Conservation and Management Plan for the Wapato Irrigation Project, Natural Resources Consulting Engineers, Inc., January 2002 (Revised June 2003).
- Wapato Irrigation Project Expanded Water Measurement Plan, Natural Resources Consulting Engineers, Inc., February 2001.
- Irrigation Water Conservation and Management Plan for the Wapato Irrigation Project Draft Report Natural Resources Consulting Engineers, Inc., May 4, 1999 (Revised July 2001).
- Declaration of L. Niel Allen in Support of the Yakama Nation's Reply to Ahtanum Irrigation District Exceptions Dated March 4, 2003 - Dated March 23, 2003.
- Declaration of L. Niel Allen in Support Of The Yakama Nation's Reply to Responses of Ahtanum Irrigation District and Responses of John Cox Ditch Company Responses Dated April 25, 2003 – Dated June, 12 2003.
- Declaration of L. Niel Allen in Support of the Yakama Nation's Reply to Ahtanum Irrigation District Exceptions Dated June 13, 2003 - dated August 13, 2003.
- Declaration Of L. Niel Allen on Behalf of The United States and Yakama Nation - Comments Based on a Review of the Supplemental Report of the Court Concerning the Water Rights for Subbasin No. 23 – June 24, 2008
- Declaration of L. Niel Allen on Behalf of The United States and Yakama Nation - Comments Based on a Review Exceptions and Objections File by Others Concerning the Supplemental Report of the Court Concerning The Water Rights For Subbasin No. 23 – July 24, 2008

- Third Declaration of L. Niel Allen on Behalf of The United States and Yakama Nation - Comments Based on a Review Exceptions and Objections File by Others Concerning the Supplemental Report of the Court Concerning The Water Rights For Subbasin No. 23 – August 14, 2008.

Duck Valley Indian Reservation – Reports prepared for the US Department of Justice and Bureau of Indian Affairs.

- Comprehensive On-Reservation Consumptive Use Water Rights Claim on Behalf of the Shoshone and Paiute Tribes of the Duck Valley Indian Reservation. April 14, 2005. Reports submitted to the State of Idaho and others for the Owyhee River Adjudication.
- Appendix F: Historically Irrigated Lands – Michael Taylor, NEA, Niel Allen, Ph.D., P.E., and Assad Safadi, Ph.D. Natural Resources Consulting Engineers, Inc.. April 14, 2005.
- Appendix H: Agricultural Engineering and Practicably Irrigable Acreage (PIA) Determination – Niel Allen, Ph.D., P.E. and Assad Safadi, Natural Resources Consulting Engineers, Inc.. April 14, 2005.
- Appendix K: Wildlife Habitat Enhancement Plan for Blue Creek – Niel Allen, Ph.D., P.E. and Assad Safadi, Ph.D., P.E., Natural Resources Consulting Engineers, Inc. April 14, 2005.

Expert Testimony during Hearings the past Four Years

L. Niel Allen has not provided expert testimony during the last four years.

Compensation for Study

Compensation received by Natural Resources Consulting Engineers, Inc. for work associated with the preparation of the *Zuni Indian Reservation Identification of Lands and Estimation of Water Requirements for Past and Present Irrigated Lands Served by Permanent Irrigation Works* Report is estimated to be \$125,000. The work is part of preparation of a hydrographic survey for the entire Zuni River Basin. A contract is yet to be put in place for expert testimony during trial, but the amount of the contract will be disclosed when determined.



NATURAL RESOURCES CONSULTING ENGINEERS, INC.
Fort Collins, Colorado

L. Niel Allen, Ph.D., P.E.

Senior Engineer

Special Skills and Expertise

Estimation of irrigation water requirements, practicably irrigable acreage (PIA) analysis, preparation of water right claims, preparation of water conservation and management plans, hydrographic surveys, irrigation system assessment, water resources planning, technical litigation support, and water rights negotiation support.

Education

Ph.D., Civil Engineering

University of Idaho, Moscow, Idaho. 1991

M.S., Agricultural & Irrigation Engineering

Utah State University, Logan, Utah. 1980

B.S., Agricultural & Irrigation Engineering

Utah State University, Logan, Utah. 1979

Professional Registrations

Professional Civil Engineer, California, No. C51308, 1994

Professional Civil Engineer, Nevada, No. 011476, 1995

Professional Civil Engineer, Utah, No. 87-172734-2202, 1987

Professional Civil Engineer, New Mexico, No.15602, 2002

State Water-Right Surveyor, Nevada, No. 1114, 2002

Advanced Training

- *Trimble Navigation Certified Mapping Course*, Fort Collins, Colorado, April 25-26, 2003.

Experience

Senior Engineer

Natural Resources Consulting Engineers, Inc.

January 1997-Present

Fort Collins, Colorado

- Technical Group Leader and Project Manager of NRCE's Agricultural Engineering Group.
- Estimates crop water and irrigation diversion requirements.
- Designs on-farm irrigation, water conveyance, and water distribution systems.
- Provides cost estimates for PIA projects.

- Identifies and maps presently and historically irrigated lands.
- Evaluates historical irrigation water use and estimates future irrigation water requirements.
- Assesses irrigation systems and provides information on water conservation and system rehabilitation.
- Provides expert witness reports and testimony concerning PIA projects and water rights.

Some of his specific projects include:

- Preparing PIA claims for the Pueblo of San Juan, Santa Clara, and San Ildefonso Indian Reservations in New Mexico (State of New Mexico v. Abbott and State of New Mexico v. Aragon).
- Preparing PIA claim and water right negotiations for the Crow Indian Reservation in Montana.
- Evaluated on-farm and district water use and water conservation measures for the Imperial Irrigation District (approximately 460,000 acres of irrigated land) in southern California.
- Identified and mapped historically irrigated land on the Shivwits and Acoma Indian Reservations.
- Supervised the mapping and preparation of water right claims for the Duck Valley Indian Reservation in southern Idaho and northern Nevada. Prepared the water right claims that were submitted to the states of Idaho and Nevada.
- Prepared technical information and conducted field investigations concerning irrigation upstream of the Duck Valley Indian Reservation.
- Developed a deficit irrigation model to estimate historical depletion by the Hopi and Navajo Indian Reservations from the northern washes of the Little Colorado River in Arizona and New Mexico.
- Prepared a water conservation and management plan, as well as developed a water measurement program for the Wapato Irrigation Project in central Washington. The Wapato Irrigation Project is a 140,000-acre irrigation project on the Yakama Reservation.
- Directed the preparation of an agricultural economic database for the Platte River in Wyoming, Colorado, and Nebraska. The database was used in the preparation of a Platte River EIS concerning endangered and threatened species that live in and along the Platte River.
- Evaluated and assessed the impacts of the 1999 U.S. Bureau of Reclamation interim operating criteria of the Weber Reservoir in Nevada on the Walker River Indian Reservation irrigated lands. The reservoir was operated at a low level due to safety concerns.
- Evaluated the water right impacts of a proposed Ahtanum Creek off-stream reservoir in Central Washington.
- Assessed irrigability and irrigation delivery system for approximately 20,000 acres of idle lands in the Wapato Irrigation Project in central Washington.
- Reviewed the State of New Mexico's San Jose River Hydrographic Survey for the Acoma Pueblo (State of New Mexico v. Kerr-McGee Crop.).
- Provided expert testimony concerning water rights in the Ahtanum Creek basin of Washington (Washington State Department of Ecology v. Acquavella, et al.).

- Project Manager for the Zuni River Basin Hydrographic Survey in New Mexico (*United States and State of New Mexico v. State of New Mexico Commissioner of Public Lands and A & R Production, et al.*). The hydrographic survey is for the adjudication of the Zuni River Basin.
- Project Manager for the design and construction of the Moapa Band of Paiute Indians Valley of Fire Water System.
- Provided expert technical support in the Quechan Tribe's water rights settlement negotiation for the Fort Yuma Indian Reservation (No. 8, Original State of Arizona, Plaintiff v. State of California et al. in the Supreme Court of the United States).
- Provide expert opinion information on retirement of irrigated lands concerning the application for water rights of Tri-State Generation and Transmission Association, Inc. in Prowers County, Colorado (District Court, Water Division 2, Colorado Case No. 2007CW74).

Senior Engineer

Bookman-Edmonston Engineering, Inc.

March 1993-January 1997

Sacramento, California

- Provided analytical support concerning irrigation consumptive use, water rights, environmental considerations, and allocation of water resources for negotiation and litigation purposes.
- Assisted in the preparation of environmental reports concerning water reclamation and development projects.

On specific projects Dr. Allen:

- Provided technical information for negotiations concerning the Fort Belknap Indian Reservation (Montana) reserved water rights.
- Provided technical negotiation support for the Truckee-Carson Irrigation District and the Lahontan Valley Environmental Alliance in Fallon, Nevada concerning issues related to water allocation on the Truckee and Carson Rivers.
- Formulated and evaluated agricultural irrigation management and conservation opportunities in the Snake River basin of Idaho and Oregon, increasing Snake River flows by one million acre-feet per year during salmon migration periods.
- Conducted on-farm irrigation and distribution system evaluations, supplied recommendations for irrigation system modifications and management improvements to increase irrigation efficiencies within five large Mexican irrigation districts.
- Prepared the description, economic analysis, and loan documentation for the construction of a groundwater/surface water conjunctive use and an in-lieu groundwater recharge system for Shafter-Wasco Irrigation District and Semitropic Water Storage District in Kern County, California.
- Determined potential agricultural irrigation demands and prepared cost estimates for facilities needing to recycle up to 290,000 acre-feet per year of water in the Sacramento and San Joaquin Counties of California, which was part of a study for the Sacramento Regional County Sanitation District.
- Evaluated institutional and physical transfer and exchange mechanisms required to recycle approximately 450,000 acre-feet per year of wastewater from the San Francisco Bay area.
- Evaluated the impact of following irrigated agricultural lands in the Sacramento Valley on the water supply in the Sacramento River and the Sacramento-San Joaquin Delta.

- Prepared an Integrated Resource Plan for Arvin-Edison Water Storage District located in the Central Valley of California.
- Assisted in the preparation of the Definite Plan Report and DEIS for the Spanish Fork Canyon-Nephi System, which is a 510 cfs, 42-mile water conveyance pipeline and a component of the U.S. Department of the Interior Central Utah Project Bonneville Unit.

Extension Water Specialist for Southern Nevada **March 1992-March 1993**
Cooperative Extension Service, University of Nevada **Reno, Nevada**

- Participated in research to determine the suitability of using saline water from shallow perched aquifers in the Las Vegas Valley as an additional source of irrigation water for turf.
- Helped prepare a document to encourage public policy dialogue in forums on managing and allocating water in Nevada, and moderated a public forum in Las Vegas using this document.
- Organized and conducted a technical conference entitled Salinity Effects on Plant-Soil-Water Relationships, which was held in Las Vegas, Nevada in 1993, and concerned the Colorado River Salinity Control Program.
- Taught Irrigation Principles, Irrigation Scheduling, and Irrigation Audit Courses to irrigation and landscape managers in Las Vegas.

Extension Irrigation Engineer and Research Engineer **1985-1992**
Utah State University **Logan, Utah**

- Performed urban and agricultural irrigation audits that included evaluation of irrigation pumping plants, hydraulics of mainlines, and adequacy of irrigation systems for over 100 irrigation systems in Utah.
- Provided guidelines for the operation and management of gravity-pressurized sprinkler irrigation systems.
- Assisted in establishing an electronic weather station network in Utah, and helped develop software that allowed the data to be used for crop water requirements and irrigation scheduling.
- Aided in interdisciplinary research on crop growth and yield as affected by environmental conditions and water management and verified evapotranspiration equations using climatic data and soil moisture measurements from neutron probe readings.
- Other areas of research include consumptive use estimation, nitrate movement determination, and evaluation of the Colorado River Salinity Control Program.
- Helped teach a five-month irrigation management training course, and presented irrigation system management information to water users.

Irrigation Engineer **1981-1985**
Snyder Irrigation and Agri-Services, Inc. **Salt Lake City, Utah**

- Designed and managed the construction of numerous irrigation systems that considered economics, soils, topography, climate, crops, labor, energy, and water resources in Utah, Wyoming, and Idaho for individual farmers and irrigation companies. The work included the design of pumping plants, pipelines, canals, water control structures, and sprinkler systems.

**Irrigation Engineer
Pitcher Irrigation Company**

**1980
Preston, Idaho**

- Supervised the design, development, and construction of irrigation systems in Idaho and Utah.

**Research and Teaching Assistant
Utah State University**

**1979-1980
Logan, Utah**

- Conducted some of the first research concerning “surge irrigation”, with an emphasis on the advance rate of water down furrows.
- Assisted in teaching a Water Law and Institution course.

Independent Consulting Experience

From 1989 to 1993, Dr. Allen provided irrigation management information to irrigators concerning the reclamation of salt-affected soils and irrigation with poor quality saline or sodic water. In addition, he assisted in the design, management, and construction of a 4,500-acre irrigation rehabilitation project, including 12 wells and 35 pivots. The annual energy usage dropped from over 9 million kilowatt-hours before rehabilitation to less than 5 million kilowatt-hours after work was completed.

Relevant Computer Skills

- *Hydrologic and Crop Water Requirement Models*: Operated several models
- *Hydraulic Models*: Operated a hydraulic pipeline network program
- *Software and Model Development*: Irrigation Scheduling Models, Crop Water Use Models, Irrigation Depletion Models
- *Programming Languages*: BASIC, FORTRAN

Professional Memberships

- American Society of Civil Engineers

Publications

- Allen, L. N. (1992). *Economical and Statistical Based On-Farm Irrigation Scheduling*, ASCE Proceedings of the Irrigation and Drainage Session at Water Forum '92 - Saving a Threatened Resource - In Search of Solutions, Baltimore, Maryland.
- ---. (1992). *Directory of Available Assistance for Nevada's Rural Water Users*.
- ---. (1991). *Economic and Statistical Based On-Farm Irrigation Scheduling*, Ph.D. Dissertation, Department of Civil Engineering, University of Idaho.
- ---. (1980). *Advance Rates in Furrow Irrigation of Cycled Flow*, M.S. Thesis, Department of Agricultural and Irrigation Engineering, Utah State University, Logan, Utah.
- Allen, L. N., and Hill, R. W. (1988). *Crop Irrigation Requirement Model for Utah*, ASCE Irrigation and Drainage Division Specialty Conference, Lincoln, Nebraska.
- ---. (1988). *Electronic Weather Stations Help Determine Crop Water Needs*, Utah Farmer-Stockman, Special Insert, August.
- ---. (1987). *Field Evaluations of Sprinkler Uniformities in Utah*, Pacific Northwest Irrigation Research Workshop, Kennewick, Washington; November.

- Allen, L. N., and Morris, R. L. (1992). *Horticulture Handbook, Chapter 4 - Irrigation*, Southern Area, Nevada Cooperative Extension.
- ---. (1992). *Irrigation Water Quality for Urban Irrigation in the Las Vegas Valley*, Nevada Cooperative Extension, Fact Sheet Number 92-69.
- Allen, L. N., and Sorensen, R. (1991). *Fall - Good Time to Maintain Pumping Stations*, Utah Farmer-Stockman.
- Bishop, A. A., Allen, L. N., Poole, G., and Walker, W. R. (1981). *Furrow Advance Rates Under Surge Flow Systems*, Transactions of ASCE Irrigation and Drainage Division 107.
- Cobourn, J., Johnson, W., Ford, J., Reid, M., and Allen, L. N. (1992). *Nevada's Water Future: Making Tough Choices, A Guide for Public Policy Dialogue*, University of Nevada, Reno.
- Cox, D. M., and Allen, L. N. (1992). *Colorado River Basin Salinity Control Project Moapa Valley, Nevada*, Nevada Cooperative Extension, Fact Sheet Number 92-69.
- ---. (1992). *Irrigation Management and Agricultural Salinity*, Nevada Cooperative Extension, Fact Sheet Number 92-69.
- Hill, R. W., and Allen, L. N. (1991). *New Statewide Weather network Helps Answer Irrigation Questions*, Published as a Special Insert to the Utah Farmer-Stockman.
- ---. (1991). *Water-Table Lysimeter Data Interpretation*, ASCE Proceeding of the International Symposium of Lysimetry - Lysimeters for Evapotranspiration and Environmental Measurements, Honolulu, Hawaii.
- ---. (1990). *Irrigation Scheduling Using Neutron Moisture Meters*, ASCE Irrigation and Drainage Division Specialty Conference, Durango, Colorado.
- Hill, R. W., Allen, L. N., Brockway, C. E., Robinson, C. W., Allen, R. G., and Burman, R. D. (1989). *Duty of Water Under the Bear River Compact: Field Verification of Empirical Methods for Estimating Depletion*, Utah Agricultural Experiment Station, Project No. 801, Research Report 125; Logan, Utah.
- Hill, R. W., Allen, L. N., Burman, R. D., and Brockway, C. E. (1986). *Meadow ET in the Bear River Basin of Utah, Wyoming, and Idaho*, ASCE Irrigation and Drainage Division Specialty Conference, Long Beach, California.
- Nielson, C., and Allen, N. (1988). *Computer Scheduling Aids Irrigation Companies*, Utah Farmer-Stockman, Special Insert.
- Ranjha, A. Y., Peralta, R. C., Deer, H. M., Allen, L. N., and Hill, R. W. (1991). *Sprinkler Irrigation - Pesticide Best Management Systems*, Cooperative Extension Service, Utah State University.
- Sorensen, R. B., Allen, L. N., and Hill, R. W. (1990). *Extending Electric Motor Life*, Information Bulletin #14 prepared for The Colorado River Salinity Program.