

## **EXHIBIT 1**

## ***Resume for Robert G. Beeby***

### **ROBERT G. BEEBY, P. E.**

B.S., Irrigation Science, University of California, Davis (1964)

Registered Civil Engineer, California #20997, Arizona #12047, New Mexico #8082

(Retired), South Dakota #3663(Retired) and Washington #40199

Registered Agricultural Engineer, California #24

#### **Work Summary**

Mr. Beeby has over 40 years of engineering experience in project planning and management of water resources for a wide range of clients, including agricultural and urban water purveyors, power providers, law firms and federal, state and local governmental agencies. He has served as Principal-in-Charge and directed technical studies related to the adjudication of pumping rights of several ground water basins, served on Technical Expert Committees appointed to develop the factual aspects of ground water basins under adjudication, directed the studies leading to water management programs/exchanges between agricultural and urban interests, developed water supply plans to provide cooling water for power plants, developed regional plans for management of surface and ground water resources, directed studies relating to technical and economic feasibility of agricultural water projects and has managed the preliminary design and construction phases of major water resource facilities. Mr. Beeby has provided expert witness testimony since 1980 in numerous proceedings relating to land, water use, groundwater adjudications and water rights. He has testified before a Special Master appointed by the Supreme Court in Arizona v. California (1980), before the California State Water Resources Control Board, California Regional Water Quality Control Boards, California Energy Commission and other judicial or quasi-judicial bodies.

#### **Representative Professional Experience**

##### **Beeby Engineering, Inc., Principal (2009- Present)**

Beeby Engineering, Inc. was formed in July 2009 to continue to provide professional services in the field of water resources. Services range from technical studies to evaluate the current and future relationship between water supplies and water demands, conceptual design of facilities to increase reliability of existing water resources, evaluations of current and projected water demands of agricultural and urban areas, preparation of regional hydrologic inventories and water balances, evaluations of the water resource aspects of required environmental documentation for proposed projects that may affect the water resources of an area and litigation support related to water resources such as groundwater basin adjudications, flood damages and water rights.

##### **Science Applications International Corporation, Principal Engineer (1998 to 2009)**

Mr. Beeby served as Vice President, Engineering Services, with SAIC Engineering, Inc. and a member of the Board of Directors. He served as Program Manager with the parent company, Science Applications International Corporation (SAIC). He was Principal-in-Charge and the Business Area Leader for Water Resource Engineering in the firm's Environmental Sciences and Planning Division and was primarily responsible for the SAIC's consulting engineering activities related to water resources.

Mr. Beeby was responsible for the SAIC engineering activities associated with the planning and management of water resources in the west. His responsibilities included the management and technical direction of the engineering and technical support staff involved in regional water

## ***Resume for Robert G. Beeby (Continued)***

resource planning, technical studies related to water supply reliability, environmental documentation and water-related litigation support. Specific activities included, but were not limited to, evaluation and implementation of water banking projects, development of exchange and transfer programs, evaluations of agricultural land and water use, irrigation practices, preparation of hydrologic inventories, analyses of unit water use values for various crops and urban development, analyses of historical hydrologic records of stream flow and diversions, evaluation of geohydrologic data to assess ground water production, analyses of water quality as a constraint on use and economic and financial analyses to assess project feasibility. Many of the water resource investigations directed by Mr. Beeby included the development of the institutional arrangements necessary for project implementation. Mr. Beeby was also responsible for client contact and has presented expert witness testimony in the fields of water rights, water use, surface and ground water hydrology and the technical and economic feasibility of irrigation projects.

Mr. Beeby directed the activities of the firm in the development of long-term water supply planning strategies for the City of Palmdale, California. Specific activities included serving on the Technical Committee for the Antelope Valley Groundwater Basin Litigation, participation in the evaluation of water supplies and demands within the Antelope Valley Groundwater Basin, direction of the engineering activities associated with the development of a ground water recharge project for the City, and serving as the technical representative of the City in the preparation of the Integrated Regional Water Management Plan for the Antelope Valley.

Mr. Beeby directed the activities of the firm in evaluations of the water supplies and demands of the Nipomo Community Services District, a hydrologic subarea of the Santa Maria Valley groundwater basin in California. Specific activities included participation in the Technical Group formed to develop the hydrologic monitoring program and annual reports to the Court on the water conditions of the Nipomo Mesa Management Area, development of water supply shortage criteria for NCSD, evaluation of existing hydrogeologic information, including historical groundwater levels, preparation of urban and agricultural water demands and preparation of hydrologic inventories.

Mr. Beeby directed the activities of the firm in the preparation of a report on the water resources within a portion of the Mojave Water Agency that might be developed for power plant cooling. Development of available water supplies must be consistent with the Mojave Basin Area Adjudication and rules and regulations established by the Court-appointed Watermaster.

Mr. Beeby directed the activities of the firm in evaluating the surface water hydrology of the upper Santa Ana River on behalf of the San Bernardino Valley Municipal Water District and the Western Municipal Water District of Riverside County, both located in Southern California. The findings of recent investigations were used to advance an application filed with the California State Water Resource Control Board by both districts to appropriate water conserved by Seven Oaks Dam, constructed by the U. S. Corps of Engineers, for flood control. The study was initiated to evaluate the potential for utilizing a portion of the inflow to the reservoir after the flood season. Specific activities included, studies related to surface water hydrology of the Santa Ana River system, analyses of the senior water right claimants, analyses of effects of Project implementation on environmental issues, evaluation of a water conservation objective, studies of reservoir operation alternatives, estimates of the amount of flow that might be put to beneficial use, and appearances before the California State Water Resources Control Board.

Mr. Beeby directed the activities of the firm in preparation of an evaluation of the water resources and development potential for a private landowner in San Diego County, California.

## ***Resume for Robert G. Beeby (Continued)***

Specific activities included the preparation of a hydrologic inventory of the available natural water supplies, potential water demands under full development conditions and conduct of assessment of environmental resources to be addressed in the environmental documentation prior to project implementation.

Mr. Beeby directed the activities of the firm for the City of Corona, California in the evaluation of the effects of a well constructed in the Coldwater Basin outside of the boundaries established by mutual agreement on nearby production wells. Specific activities included an evaluation of the geohydrologic conditions of the basin in order to develop operational procedures so both competing entities could sustainably operate the basin. Negotiations are underway.

Mr. Beeby directed the activities of the firm for the City of Rancho Cucamonga in the hydrologic evaluation of a flood event in the City. Specific activities included an evaluation of historical rainfall/runoff relationships and for the specific storm event, effects of land development over time on runoff conditions and the adequacy of the storm water drainage system operated by the City and the private landowner whose property was damaged.

Mr. Beeby directed the activities of the firm in providing technical consulting services to the Friant Water Users Authority (FWUA), a joint powers agency that operates the Friant Division of the federal Central Valley Project (CVP). The Friant Division of the CVP includes roughly 25 water districts, encompassing about one million acres of agricultural land, generally located on the east side of the San Joaquin Valley, California. Water deliveries are about 1.2 million acre-feet annually. SAIC provided technical assistance to FWUA on a number of wide-ranging projects; some of the projects would help to resolve environmental concerns related to the operation of the Friant Division; others relate to improving the water supply reliability. SAIC staff also assisted FWUA staff in the management of consultants retained.

A separate portion of FWUA work directed by Mr. Beeby included an evaluation of a water management partnership with the Metropolitan Water District of Southern California which has the objective of improving the water supply reliability for the 25 FWUA Member Districts and improving the quality of the imported water supply delivered to Metropolitan. Studies included evaluations of additional surface and ground water storage facilities, potential for conjunctive use of surface and ground water supplies, effects of water quality on agricultural production, conveyance facilities to accomplish transfers or exchanges. Specific assignments relate to an appraisal-level evaluation of the potential for increasing the storage capacity of the Mammoth Pool Reservoir and a systems operations study of the entire Friant system and other conveyance facilities located in the San Joaquin Valley to evaluate scenarios to improve operational flexibility.

Mr. Beeby directed the activities of the firm in an evaluation of water rights of the Kern River, located in the southern end of the San Joaquin Valley in California. The specific issue addressed related to the forfeiture of a senior water right to a junior. Specific analyses included the evaluation of over 100 years of hydrologic flow and diversion data. Mr. Beeby provided expert testimony connected with this work.

Mr. Beeby directed and provided senior review for the investigation of the Practicably Irrigable Area (PIA) of a portion of the Lummi Reservation in Northwest Washington. SAIC's client was the State of Washington, Department of Ecology and the State Attorney General. In another PIA investigation, Mr. Beeby was retained as a consultant to the Metropolitan Water District of Southern California to provide historical background and technical advice relating to the continuation of *Arizona v. California* in which he provided expert testimony related to practicably irrigable areas in 1980.

## ***Resume for Robert G. Beeby (Continued)***

Mr. Beeby provided senior review and direction for an appraisal-level investigation of a project that would include construction of a desalting facility on the Colorado River Aqueduct, two hydroelectric power generating facilities, penstocks and appurtenances. The overall project objectives are to reduce the total dissolved solids content of the water delivered to the Metropolitan Water District of Southern California from the Colorado River, to generate power as the reject stream is discharged to the Salton Sea and to assist in efforts underway to stabilize water levels and salinity of the Salton Sea.

Mr. Beeby directed the activities of the firm in the preparation of an evaluation of the effects of continuing the implementation of the Physical Solution adopted by the Superior Court, Riverside County, to resolve the overdraft situation in the Mojave River Basin and presented expert testimony. Specific activities included projections of the amount of imported water required to bring the five subareas of the Mojave River Basin into hydrologic balance, preparation of estimates of the number of agricultural interests that would be affected and the estimated cost. He also directed the activities of the firm in the preparation of an evaluation of technical reports relating to analyses of the effects of pumping and recharge on native vegetation.

Mr. Beeby directed the activities of the firm and provided engineering and technical assistance to the Tejon Ranch Company in support of their water rights applications submitted to the California State Water Resources Control Board to appropriate water from several local watersheds located at the southern end of the San Joaquin Valley. Analyses included preparation of estimates of historical water demands, evaluation of the amounts of water that might be captured for beneficial use, diversion amounts, design of measuring facilities and development of a management and documentation program for surface water resources available to the Ranch. Mr. Beeby directed the activities of the firm in the preparation of an evaluation of a groundwater banking and extraction project for the Wheeler Ridge-Maricopa Water Storage District, located in the southern end of the San Joaquin Valley, California. Specific activities included evaluations of the general subsurface geology, selection of the recharge areas, analyses of the reliability of the imported water supply, preliminary system layouts, estimates of probable construction costs and estimates of projected annual costs. These data were compiled to derive the unit cost of water in dollars per acre-foot.

Mr. Beeby directed the activities of the firm in the preparation of the water plan and evaluation of the water resource aspects of a proposed expansion of High Desert Power Project I, located in the vicinity of Victorville, California and within the Service Area of the Mojave Water Agency. The task was to develop a reliable water supply for power plant cooling when water is not available from the California State Water Project. Specific activities include the direction of the hydrogeologic studies related to the effects of groundwater recharge and extraction for Project purposes on nearby wells, preliminary engineering layouts of the proposed well field and conveyance pipelines, evaluations of the use of existing water conveyance facilities and cost estimates thereof.

Bookman-Edmonston, Engineering, Inc., Principal Executive Engineer (1966 to 1998)

Mr. Beeby directed the preparation of the water plan and evaluation of the water resource aspects of the proposed High Desert Power Project to be located in the vicinity of Victorville, California. Specific activities included the direction of the hydrogeologic studies related to the effects of groundwater extractions for the Project on nearby wells, preliminary engineering layouts of the proposed well field and conveyance pipelines and cost estimates thereof. Activities also included appearances before the California Energy Commission and the Boards of Directors of local water purveyors to discuss the water supply aspects of the Project.

## ***Resume for Robert G. Beeby (Continued)***

Mr. Beeby was responsible for preparation of a regional water management plan for the Mojave Water Agency, which encompasses about 5,000 square miles and includes communities from Hesperia to Barstow along the Mojave River in the high desert area of California. Activities included preparation of hydrologic inventories of historical conditions, estimates of future demands, identification of water marketing strategies for the imported supplies from the California Aqueduct and responsible for the technical aspects of the public involvement program. He also provided technical input to the development of the principles of the adjudication of rights to pump groundwater within that portion of the Agency that drains to the Mojave River and appeared as an expert witness and as a rebuttal witness in the trial held in Superior Court of the State of California in and for the County of Riverside.

Mr. Beeby directed the preliminary planning of the \$50 million Mojave River Aqueduct Project for the Mojave Water Agency located in the high desert area of California. Specific activities included investigations to determine the size of the conveyance and groundwater recharge facilities, conceptual development of the financial program, preparation of the preliminary design, engineering report and cost estimates. He assisted the Agency staff and Board in preparation of documentation to secure federal assistance in project funding.

Mr. Beeby was responsible for studies to establish "Zones of Benefit" for the Mojave Water Agency. Activities included evaluation of imported surface and groundwater resources quality and quantity and estimated impacts of proposed recharge program.

Mr. Beeby was responsible for operational studies of a water exchange and conjunctive use program between the Metropolitan Water District of Southern California and the Arvin-Edison Water Storage District, located in Kern County, California. Activities included evaluation of capacities of joint use facilities, agricultural water demands, energy requirements, and costs associated with groundwater extraction and surface water deliveries. He also provided input data to the environmental documentation. He also provided technical assistance in developing the final agreement between the two parties and developed the groundwater operating criteria that was incorporated in the Agreement.

Mr. Beeby directed preliminary design and cost estimating for an additional 5,000 acres of irrigation service area for the Arvin-Edison Water Storage District and an additional 20,000 acres of irrigation service area to the Semitropic Water Storage District, in connection with water exchange and banking programs. He also directed the preparation of a computer model of A-E operations to evaluate the effects of the proposed program on groundwater levels.

Mr. Beeby participated in an investigation of flood damage to landowners on behalf of the Arvin-Edison Water Storage District, California. He served as construction inspector and office engineer responsible for evaluations of construction quantities and contractor pay requests.

Mr. Beeby directed the evaluation of irrigation systems in Sinaloa and Sonora Provinces of Mexico. The objective of the assignment was to recommend both structural and nonstructural improvements for rehabilitation of the conveyance and distribution systems that were constructed in the 1940s. Specific activities included field surveys, interviews with irrigation system managers, evaluations of on-farm irrigation efficiency, evaluations of system efficiencies, preparation of preliminary cost estimates and review of farm economics.

Mr. Beeby developed the water resource section of the scope of work for a proposed project in Oman for USAID. Specific activities included inspection of the existing falaj system in the project area and preliminary evaluations of hydrogeologic conditions for groundwater recharge using reclaimed wastewater and use of spreading ponds or injection wells to mitigate the effects of seawater intrusion.

## ***Resume for Robert G. Beeby (Continued)***

Mr. Beeby was responsible for the preliminary planning and engineering studies for a 445,000-acre irrigation project, to be funded by the Inter-American Development Bank, in the Guanacaste Province of Costa Rica. Activities included forecasts of cropping patterns, estimates of water supply and demands, evaluation of surface and subsurface drainage problems and solutions, and preparation of feasibility-level designs and cost estimates of project works, including irrigation and drainage facilities, transportation network, power supply, and community development. He was also responsible for the preparation of feasibility reports and plans and specifications for project design and the development of a 2,000-acre demonstration area.

Mr. Beeby directed the evaluation of the physical and economic impacts of importation of California State Water Project water for the Wheeler Ridge-Maricopa Water Storage District. The District includes nearly 147,000 acres, of which over 88,000 acres receive imported water for irrigation. Specific activities undertaken on behalf of the District include the preparation of hydrologic inventories to determine the change in groundwater storage underlying the District and evaluation of the aquifer characteristics to determine the changes in pumping depths since Project inception in the early 1970s. These physical changes were evaluated to estimate the resulting economic impacts under historical and projected non-project conditions.

Mr. Beeby conducted studies for proposed commercial, residential and recreational developments in southern San Joaquin Valley for the Tejon Ranch Company, Kern County, and along the southern California coast. Activities included projections of future water demands for various development scenarios, evaluation of surface and groundwater supplies, and preparation of cost estimates of alternative water supply facilities.

Mr. Beeby directed the evaluation of standards established by the Arizona Department of Water Resources for Second Management Period of the Arizona Groundwater Management Act. Specific activities included evaluation of maximum conservation standards, on-farm irrigation efficiency, crop unit consumptive use values, leaching requirements, and economic studies to determine if proposed standards were consistent with prudent long-term management practices. He was appointed by the Director of the Arizona Department of Water Resources to serve on the Agricultural Technical Advisory Committee and served as Co-chairman of the Economic Subcommittee.

Mr. Beeby participated in the preparation of a feasibility study for the groundwater banking and extraction program for the Semitropic Water Storage District, Kern County, California.

Mr. Beeby investigated water use practices of the Imperial Irrigation District, located near the Salton Sea in southern California. Specific activities included evaluation of consumptive use within the District and analyses of the effects of District policies on water use efficiencies. He presented expert witness testimony before the State Water Resources Control Board, California.

Mr. Beeby directed the activities of the firm in the evaluation of historical water levels of the Salton Sea, California for the Imperial Irrigation District. Shoreline property owners claimed flooding to their holdings was due to inefficient water management practices. Specific activities related to the hydrology of the inflow to the Sea, land ownership and parcel identification and expert testimony.

Mr. Beeby conducted reconnaissance-level investigations of landowner repayment capabilities associated with the CENDAK Project, a proposed 500,000-acre irrigation project in South Dakota. Specific activities included preparation of projected farm and crop budgets and evaluation of irrigation requirements for various crop patterns.

Mr. Beeby conducted a study for the states of Arizona, California, and Nevada to evaluate claims for additional water rights made by and on behalf of five Indian reservations located along the

## ***Resume for Robert G. Beeby (Continued)***

Lower Colorado River. Activities included classification of land for irrigated agriculture, determination of crop suitability, evaluation of agricultural production costs and returns, irrigation distribution system layout and cost estimates, and evaluation of on-farm irrigation practices. Mr. Beeby qualified as an expert witness in this case and presented testimony before a Special Master appointed by the Supreme Court of the United States in connection with the reopening of the case of *Arizona v. California* in 1980. .

Mr. Beeby conducted a study for the Salt River Project to determine the development potential and associated water requirements of six Indian reservations in central Arizona, encompassing a total area of approximately 3.5 million acres. Activities included evaluation of agricultural, mineral, timber, and recreational developments, evaluation of water requirements and availability of local and imported water supplies, preparation of cost estimates of water supply facilities, determination of financial feasibility and economic impact, and evaluation of the effects of upstream developments on downstream water quality.

Mr. Beeby conducted water resource evaluations of proposed agricultural development on Indian reservations located in San Diego County. Studies included investigation of Indian water rights, Practicably Irrigable Area, available surface water supplies and groundwater supplies from the Pala-Pauma groundwater basins, and water demands for irrigation, recreational, municipal, and industrial use.

On behalf of the Los Angeles Department of Water and Power, Mr. Beeby directed the evaluation of the possible Indian water rights in the Owens Valley, California. Studies of Practicably Irrigable Area included evaluations of climate and soil characteristics for crop production, crop yields and production costs, ground water supplies, capital cost estimates of on-farm irrigation systems and wells, annual costs of those facilities.

Mr. Beeby participated in an evaluation for the City of Escondido of potential for increased power generation and utilization of local water supplies that could result from revised operating procedures. He directed the technical aspects of the evaluation of the effects of operational changes on the utilization of local water supplies.

Mr. Beeby participated in the planning of projects to supply water to Castaic Lake Water Agency, Santa Barbara County Water Agency, City of Escondido, Vista Irrigation District, and other clients.

Mr. Beeby evaluated the feasibility of proposed major water distribution projects in the southern San Joaquin Valley for Arvin-Edison, Semitropic, and Wheeler Ridge-Maricopa Water Storage Districts. Activities included evaluations of the ability of farmers to pay for irrigation water from irrigation projects.

Mr. Beeby was the Construction Supervisor responsible for construction inspection and contract administration for the construction of an 11-mile, 570 cubic-feet per second, unlined canal for the Buttonwillow Improvement District, Kern County, California.

Mr. Beeby directed an assessment survey for the City and County of Yuma, Arizona, relating to management of their available supplies over the next 100 years. Water supplies, water rights, and water demands were evaluated and estimated as part of the investigation.

Mr. Beeby was responsible for the technical direction of a study performed for the U.S. Bureau of Reclamation involving the determination of salt loading to the Colorado River from the Palo Verde Irrigation District, located in Blythe, California.

Mr. Beeby conducted a hydrologic inventory and prepared input data for the conservation element of the revised general plan for Santa Barbara County, California.



## ***Resume for Robert G. Beeby (Continued)***

Mr. Beeby evaluated water resources availability to a proposed recreational development in Cambria, California. Possible sources included both groundwater and surface supplies to be impounded by a dam.

Mr. Beeby conducted an inventory of the physical properties and assets of the Escondido Mutual Water Company, located in southern California.

Mr. Beeby participated in the investigation of the flood hazard for California State University, located in Bakersfield, California.

Mr. Beeby evaluated the surface and groundwater resources of the Tulare Lake Basin of central California. Studies included the evaluation of the quantity of surface runoff from ephemeral streams located in the San Joaquin Valley, in connection with the 5D basin studies prepared for the State Water Resources Control Board.

Mr. Beeby prepared estimates and evaluated records relating to reconstructed full natural flow for the San Luis Rey River in San Diego County, California.

Rancho Sespe, Ranch Engineer (1964 to 1966)

Mr. Beeby served as Ranch Engineer and performed irrigation efficiency studies on sprinkler-irrigated lemons and made recommendations to reduce the water application rate; assisted in design and field layout of new groves; and supervised various orchard maintenance crews for a citrus ranch in Fillmore, California.

Libby, McNeil & Libby, Agriculturist (1964)

As an agriculturalist, Mr. Beeby advised Libby, McNeil and Libby and consulted with and advised growers in Europe on irrigation methods, scheduling, and most efficient means of irrigating deciduous and citrus fruit orchards and vegetable crops.

University of California, Davis, Laboratory Assistant (1961 to 1963)

Mr. Beeby was involved in agricultural water use studies and irrigation scheduling as a laboratory assistant for the Department of Water Science and Engineering, University of California, Davis.

Gage Canal Company, Engineering Assistant (1962)

Mr. Beeby organized the pump and well testing program and collected data from local citrus farmers to be used in scheduling water deliveries for the Gage Canal Company, Riverside, California.

Specialized Training

- Seminars on hydrology and hydrologic methodologies
- Seminars on water rights in California

Professional Affiliations

- Life Member - American Society of Civil Engineers
- U.S. Committee on Irrigation and Drainage
- Colorado River Water Users Association

## RESUME

# Kenneth W. Utley

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### ***Specialization:***

Thirty-seven years of experience in engineering geology including definition of geologic and lithologic features in groundwater basins; and investigation and definition of areal and vertical extent of aquifers. Development of geologic and lithologic descriptions from formation samples and geophysical logs for groundwater development and groundwater contamination studies. Investigation of erosional processes, landslides, and stream hydrology; and design and implementation of erosion-control projects on steep mountainous terrain. Detailed soil and sedimentary mapping for seismic safety.

### ***Professional Registration:***

Certified Engineering Geologist, California, C.E.G. 1268  
Registered Geologist, California, R.G. 3940

### ***Academic Degrees:***

M.S. Geology, Arizona State University, Tempe, AZ	1981
B.S. Geology, State University of New York, College at Oneonta, NY	1974

### ***Professional Experience:***

Luhdorff and Scalmanini, Consulting Engineers, Woodland, CA Senior Engineering Geologist	1985 to Present
Redwood National Park, U.S. Department of Interior Resource Management Division Supervisory Management Geologist	1981 - 1985
Redwood National Park, U.S. Department of Interior Resource Management Division Management Geologist	1980 - 1981
Fugro, Consulting Engineers & Geologists, Phoenix, AZ Staff Geologist	1976 - 1979

### ***Representative Professional Assignments:***

- Conduct geologic investigations for groundwater development, utilization, and management. Definition of geologic, stratigraphic, structural, and lithologic features of groundwater basins. Delineation of areal and vertical extent and nature of aquifers. Construct geologic cross-sections, fence diagrams, isopach maps, and other derivative maps of aquifers. Interpretation of depositional environments, facies relationships and evolution of sedimentary deposits in groundwater basins. Evaluate locations for test holes and production well sites. Contract with drilling companies to conduct drilling programs. Evaluate geologic samples from drilling operations and geophysical logs. Design monitoring wells and production wells for groundwater evaluation, utilization, and contamination investigations.

***Representative Professional Assignments (Continued):***

- Supervised Engineering Geology section of Erosion-Control Program of three to four project level geologists, and up to eight assistant geologists. Planned, budgeted, and coordinated annual work on four to six projects. Prepared and oversaw contract specifications and evaluated subordinates' technical proposals. Coordinated heavy equipment selection and utilization between projects. Supervised and edited summary reports on erosion-control work completed. Performed tasks of project management geologist in supervising individual erosion control project. Prepared reports for other divisions on engineering geologic problems. Provided lectures and field trips to upper level management, visiting dignitaries, and interested public.
- Performed engineering geology projects to control accelerated erosion on steep, mountainous terrain from previous logging and road-construction land use activity. Detailed field mapping of erosional features such as gullies and landslides, air photo interpretation, and evaluation of future erosion and erosional processes. Planned, designed and implemented erosion-control work, including road removal, landslide treatments, and channel protection devices. Supervised heavy equipment and labor crews in construction of erosion-control work. Wrote summary reports and cost analysis of work performed.
- Performed engineering geology at nuclear power plant site examining plant excavations for evidence of faulting. Included detailed mapping of sedimentary stratigraphy and soils; and examination, description, and documentation of geology in shallow trenches and deep foundation excavations. Logged geologic boreholes for detailed site characterization. Supervised one to three staff geologists and up to three field assistants. Documented findings in maps, cross-sections, and reports, and presented results to regulatory agencies.

***Professional Affiliations:***

Geological Society of America (1974-present)

Society of Economic Paleontologists and Mineralogists (1976-1996)

**Assignment****President****Education****M.S., Systems  
Engineering, University of  
California, Los Angeles,  
1976****B.S., Engineering,  
University of California,  
Los Angeles, 1975****Registrations****Professional Civil  
Engineer, California  
C32331**

Mr. Wildermuth has 36 years of experience in water resources engineering and planning, including surface and groundwater hydrology and hydraulics, water resources planning, surface water and groundwater computer simulation modeling, water rights, surface water and groundwater quality, flood plain management, municipal recycled water discharge impacts in receiving waters, and water supply and flood control facility design. Mr. Wildermuth has extensive expertise in the development of water resource management plans for groundwater basins and watersheds in Southern California, and he has provided expert witness testimony and opinions for litigation support and mediation in several important cases.

Prior to starting his own company, Mr. Wildermuth held responsible positions at major environmental consulting firms, including James M. Montgomery, Consulting Engineers, Inc., where he was a principal engineer from 1987 to 1990; Camp Dresser and McKee, Inc. from 1980 to 1987; and Tetra Tech from 1976 to 1980. In 1990, Mr. Wildermuth started his own company to focus specifically on water resources management studies and the application of state-of-the-art technology to water resources projects. The company was incorporated as Wildermuth Environmental, Inc. .

Mr. Wildermuth received a B.S. in Engineering from the University of California at Los Angeles in 1975 and an M.S. in Engineering Systems from the University of California at Los Angeles in 1976. He is a member of the National Ground Water Association, the American Water Resources Association, and the Groundwater Resources Association of California. Mr. Wildermuth is a registered professional civil engineer in the State of California.

**Selected Project Experience****Wildermuth Environmental, Inc. – 1990 to Present****San Juan Basin Groundwater Management Plan and Facilities Plan Update,  
San Juan Basin Authority**

Mr. Wildermuth serves as the project manager, facilitator, and lead technical analyst for the update of the San Juan Basin Groundwater Management Plan and Facilities Plan. The original plan was developed in the early 1990s and resulted in the construction of a groundwater desalter and monitoring. Since that time significant development has occurred, and there is increasing pressure to optimize the use of all resources, specifically groundwater. Mr. Wildermuth and his team completed the most comprehensive “state of the basin” assessment ever done for the Basin, evaluated the hydrology of the Basin to estimate sustainable yield, and are currently evaluating alternatives to increase the sustainable yield. This project is ongoing.

**Phase I Investigation to Develop the Cucamonga Basin Groundwater  
Management Plan Cucamonga Valley Water District and San Antonio Water  
Company**

Mr. Wildermuth serves as the project manager, facilitator, and lead technical analyst for the Cucamonga Basin Groundwater Management Plan. The major pumpers in the Basin have developed a series of management principles around the concept of sustainability. Mr. Wildermuth and his team completed the most comprehensive “state of the basin” assessment ever done for the Basin, evaluated the hydrology of the Basin to estimate sustainable yield. Water quality degradation from past agricultural land use and current onsite waste disposal practices limit production. WEI is about to start the second phase of this work, which involves the development of a new high-resolution groundwater model and the development and evaluation of groundwater management concepts to enable expanded production.

**2012 Anti-Degradation Investigation for the Beaumont Basin, Cities of Banning and Beaumont, Beaumont Cherry Valley Water District, and the Yucaipa Valley Water District**

Mr. Wildermuth was the project manager in an investigation to predict the TDS and nitrogen concentrations in the Beaumont Management Zone that will result from future groundwater management and recycled water management plans. WEI staff developed and applied a “constantly-stirred reactor” model to estimate the TDS and nitrogen in the water supplies of each municipal pumper in the Basin, the TDS and nitrogen added through use, the impact of evapotranspiration, etc., to estimate the TDS and nitrogen concentrations in the groundwater and at recycling plants at the end of each time period. Twelve management alternatives were evaluated. The results are being used by the Regional Board to prepare a Basin Plan amendment and to write new recycling permits for the client agencies. The work was done in a stakeholder process.

**2010 Expert Witness, Antelope Valley Adjudication, Phase III Trial, Law Offices of Lagerlof, Senecal, Gosney and Kruse LLP**

Mr. Wildermuth provided expert witness testimony in the Phase III trial where the safe yield of the Antelope Valley groundwater basin was decided. Mr. Wildermuth conducted extensive research, developed a methodology to compute natural recharge, and provided testimony regarding this work. Mr. Wildermuth’s testimony was a significant part of case presented by the municipal water purveyors and the US Government. The municipal water purveyors and the US Government prevailed in this phase of the trial.

**2010 Recharge Master Plan Update, Chino Basin Watermaster**

Mr. Wildermuth served as the project manager, facilitator, and lead technical analyst for the development of the 2010 Recharge Master Plan Update. This investigation was ordered by the Court and had a Court imposed deadline for completion. Mr. Wildermuth designed the investigation and the report, which were approved by stakeholders and submitted to the Court for approval. The Court subsequently approved Mr. Wildermuth’s investigation plan and scope. Mr. Wildermuth managed the overall execution of the investigation, which included three other consultants. Mr. Wildermuth lead nine workshops over a 15-month period and completed the final report one month prior to the Court appointed deadline. The product of this work has been highly praised for its completeness, technical sophistication, and the transparent process in which the work was conducted. Draft sections of the report were posted on the project website, which was developed and maintained by WEI. State-of-the-art surface water models were used to estimate stormwater recharge in spreading basins and in localized recharge facilities that will be constructed to comply with the 2010 MS4 permits. The investigation also determined the existing recharge capacity for imported and recycled waters and the future recharge capacity requirements. The report included conclusions and recommendations for future recharge projects and future supplemental water supply sources, including non-Metropolitan imported water supplies. Currently, Watermaster and the stakeholders are preparing to implement the recommendations of the 2010 Recharge Master Plan Update.

**2009 Production Optimization and Evaluation of the Peace II Project Description, Chino Basin Watermaster**

In 2007, WEI conducted the Peace II Agreement engineering work for the Watermaster. This work considered future groundwater production projections through 2060, the effective period of the Peace Agreement. This work concluded that the projected groundwater production patterns of the stakeholders coupled with

the existing recharge assets available to Watermaster would lead to unacceptable groundwater depressions in the Chino Basin. Part of the reason for these depressions is the uncoordinated siting and pumping of wells by the stakeholders. WEI examined the projected groundwater production patterns and associated recharge plans to determine if changes could be made in the siting of future wells and if production could be redistributed among wells to reduce the magnitude of changes in groundwater levels. WEI investigated the use of different groundwater recharge schemes to balance groundwater production and recharge in the basin. WEI applied state-of-the-art groundwater models (developed by WEI for Watermaster in 2007) iteratively to optimize groundwater production and recharge patterns in the basin. These revised groundwater production and recharge patterns were then incorporated into an analysis of modifications to the Optimum Basin Management Program, which are required to expand the desalter production facilities and to meet other requirements of the OBMP. Under Mr. Wildermuth's direction, WEI staff used a series of groundwater models to estimate future groundwater elevations across the basin, groundwater elevation time histories at every municipal and many private wells, subsidence potential, impacts on riparian vegetation, impacts to stream flow, and the impact on the transport of several contaminant plumes. The resulting work was accepted by Watermaster and the Inland Empire Utilities Agency and was subsequently incorporated into the *2010 Peace II Subsequent Environmental Impact Report*.

#### **Optimum Basin Management Plan (OBMP), Chino Basin Watermaster**

Mr. Wildermuth serves as the project manager and lead technical analyst, providing as-needed engineering services to the Chino Basin Watermaster. Activities include the review of water rights applications, storage losses from over-year groundwater storage accounts, and groundwater monitoring; estimating salt offset credits and the replenishment volumes required for proposed groundwater treatment project(s); coordinating with the San Bernardino County Flood Control and Conservation District regarding recharge and with the Metropolitan Water District regarding water rates and seasonal storage service.

As the project manager, Mr. Wildermuth developed and implemented the scope of work for the Chino Basin OBMP, which was ordered by the San Bernardino Superior Court. Specifically, Mr. Wildermuth developed the process used in developing the OBMP scope of work and authored the engineering and institutional scopes of work. WEI, under the direction of Mr. Wildermuth, completed engineering and scientific investigations and developed the resulting management plan. The engineering scope of work included the problem definition, the development of goals, developing evaluation tools (groundwater and financial models), developing and analyzing management components, the integration of management components, financial analysis, and the development of an implementation plan.

#### **Optimum Basin Management Plan Implementation, Chino Basin Watermaster**

Mr. Wildermuth is the project manager for WEI's involvement in the implementation of the OBMP. WEI's efforts include large-scale surface water discharge and water quality (20 stations), groundwater level and water quality (600 wells), groundwater recharge, InSAR, and extensometer monitoring programs. WEI also provides oversight on well siting and related impact analyses for new desalter wells.

#### **Chino Basin Dry-Year Yield Program, Chino Basin Watermaster**

Mr. Wildermuth serves as the project manager for WEI's involvement in the development of the Chino Basin Dry-Year Yield (DYY) Program. WEI assisted the Watermaster and the Inland Empire Utilities Agency in the development of the 100,000 acre-ft DYY program. WEI completed a thorough reassessment of the

hydrogeologic conditions  
of the Chino Basin and

assisted other consultants with facility planning, including well siting, water quality  
evaluations, and specialized

mapping. WEI developed and applied a sophisticated set of surface and ground water models to evaluate the DYY's impacts on groundwater levels, contaminant plume movement, and surface and ground water interaction in the southern part of the basin. Currently, WEI is expanding this analysis to investigate groundwater storage programs of up to 500,000 acre-ft.

**Preparation of Problem Statement and Estimate of Recharge, Antelope Valley Groundwater Adjudication Process, Lagerlof and Senecal**

Mr. Wildermuth participated with a panel of experts to estimate the natural recharge in the Antelope Valley adjudication area. Mr. Wildermuth's responsibilities were to estimate the change in groundwater storage during the base period and use the change in storage estimates with production estimates and artificial recharge estimates to compute natural recharge. Mr. Wildermuth and WEI staff exhaustively analyzed groundwater level records and well completion reports to develop a comprehensive groundwater storage change model. Mr. Wildermuth's work was reviewed and approved by the panel of experts and included in their report.

**Recharge Master Plan, Chino Basin Water Conservation District, Chino Basin Watermaster, and the San Bernardino County Flood Control District**

Mr. Wildermuth was the project manager and lead technical analyst for the recharge master plan of the Chino Basin. The objectives of the master plan were to develop a plan of recharge to meet future groundwater replenishment requirements—utilizing storm water, recycled water, and imported water—and to evaluate the change in groundwater recharge caused by the construction of San Sevaine Creek and East Etiwanda Creek flood control improvements. This study utilized a daily runoff model to estimate the magnitude and temporal distribution of storm water recharge.

Under the master plan, recycled water and imported water are recharged during periods that ensure minimum conflict with storm water recharge. New facilities and modifications to existing facilities were recommended. A second phase of the recharge master plan was completed as part of the Chino Basin OBMP, in which WEI collaborated with the Black and Veatch Corporation. Upon completion, the Chino Basin Watermaster, the Inland Empire Utilities Agency, the Chino Basin Water Conservation District began converting 19 flood retention basins to spreading basins and began building two new recharge facilities. The total cost of the recharge improvements was about \$45 million.

**Analyses of Recharge and Recharge Facilities, Chino Basin Water Conservation District**

Mr. Wildermuth conducted studies to determine the annual average recharge at the Chino Basin Water Conservation District's storm water recharge facilities. Daily flow simulation models were developed and applied for a 41-year period. The results of this study are being used to improve operations and maintenance schedules at existing facilities. Mr. Wildermuth also developed a monitoring program to determine changes in percolation rates and subsequent maintenance practices to restore maximum percolation rates. A key component of the monitoring program was the installation of digital water level sensors with integral data loggers to measure basin water levels every ten minutes. WEI developed the analytical methods and software to convert these observations into estimates of basin inflow, outlet discharge, evaporation losses, and basin recharge.

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**Salt and Nutrient Management Plan Development, Nitrogen and TDS Task Force(administered by the Santa Ana Watershed Project Authority )**

Mr. Wildermuth was the architect and co-project leader for the development of a comprehensive salt and nutrient management plan for the Santa Ana Watershed. Working with stakeholders and another consultant, Mr. Wildermuth designed the stakeholder process and comprehensive work plan for a multiphase multi-year investigation that would result in a complete rewrite of the salt and nutrient management plans in the Santa Ana Watershed Basin Plan. In this investigation, the Basin Plan objectives for TDS and nitrogen were reset—based on the best available data and scientific methods—and new procedures were developed to assess the availability of assimilative capacity. Phase 1 involved the development of procedures for evaluating TDS and nitrogen impacts from recycling projects in the Santa Ana Watershed, a massive data collection and validation effort, watershed characterization, and an initial assessment of TDS and nitrogen loads to surface water and groundwater from municipal recycled water

treatment plants and non-point sources.

Phase 2A involved delineating new basin/management zone boundaries, developing groundwater storage estimates for each management unit, estimating TDS and nitrogen statistics at wells, computing volume-weighted TDS and nitrate concentrations for the new basin/management zones, and completing a new wasteload allocation analysis for the Santa Ana River and selected tributaries.

Phase 2B involved the development and implementation of a sophisticated modeling system to evaluate the then current TDS and total inorganic nitrogen (TIN) wasteload allocations for municipal recycled water plants that discharge to the Santa Ana River and its tributaries. A daily stream flow simulation model was used to estimate TDS and TIN concentrations in the Santa Ana River and its tributaries in response to recycled water discharges, storm water runoff, non-tributary discharges, and groundwater interaction.

**San Timoteo Watershed Management Program, San Timoteo Watershed Management Authority**

Mr. Wildermuth was the project manager and lead technical analyst in the development of a watershed management program for the San Timoteo Watershed. This effort involved designing the investigation; conducting a stakeholder process; a baseline water resource inventory and characterization; establishing the issues, needs, and wants of the stakeholders; articulating the program goals and impediments to those goals; the development of “program elements” for a watershed-scale management program to remove impediments to those goals; and the development of an implementation plan and cost estimates.

The resulting water resources management plan contained a program to expand the water supply from its current level of about 32,000 acre-ft/yr to 99,000 acre-ft/yr.

**Beaumont Basin Adjudication, San Timoteo Watershed Management Authority:**

Mr. Wildermuth provided engineering and hydrogeologic support services to the Cities of Banning and Beaumont, the Beaumont Cherry Valley Water District, the South Mesa Water Company, the Yucaipa Valley Water District, and other groundwater pumpers in the Beaumont Basin adjudication. Mr. Wildermuth developed the physical solution incorporated into the stipulated agreement in 2004. Since 2004, WEI under, Mr. Wildermuth’s direction, has prepared the engineering and annual reports for the Beaumont Basin Watermaster.

**Hot Creek Fish Hatchery Spring Flow, Mammoth Community Water District**

Mr. Wildermuth was the project manager and lead technical analyst for an investigation of groundwater pumping impacts on Hot Creek Fish Hatchery spring flow. This investigation, which was completed in 1995, showed that existing groundwater production had negligible impacts on spring discharge. Subsequently, WEI reviewed newly obtained data for the 1995 through 2001 period, verifying its 1995 findings and paving the way for increased groundwater production to support new development. This work was revisited in 2003 due to concerns that increased groundwater production might impact springs in the Valentine reserve. Subsequent analyses by WEI demonstrated that no impacts would occur as a result of production.

**Groundwater Management Plan, Eastern Municipal Water District**

Mr. Wildermuth developed a groundwater management plan for the West San Jacinto Basin, consistent with the long-term water resource management goals of the Eastern Municipal Water District and agricultural water users. The plan was developed under the then recently enacted California groundwater management statute (AB

3030) and was subsequently implemented. This plan received the Edmund G. Brown award from the State of California in 1995.

**Meniffee Basin Desalter, Eastern Municipal Water District**

Mr. Wildermuth conducted investigations to design a 3-mgd well field for the Meniffee Basin Desalter.

**Groundwater Modeling, Montgomery Watson (for the Santa Ana Watershed Project Authority)**

Mr. Wildermuth provided hydrologic and groundwater-modeling services for the design of two 8-mgd well fields and a 12-mgd well field in the Chino Basin. These well fields were intended to feed the desalting facilities owned by the Santa Ana Watershed Project Authority. Mr. Wildermuth assisted the Chino Basin Watermaster in the development of replenishment sources for the Chino desalting facilities and in the determination of salt extraction credits for agricultural interests in the basin.

**Groundwater Contamination Superfund Site, Confidential Client**

WEI conducted a study to determine the potential source(s) of a groundwater plume that contains volatile organic compounds (VOCs), primarily trichloroethene (TCE) and tetrachloroethene (PCE). Mr. Wildermuth was responsible for the development of groundwater flow and transport models to determine the source(s) of these contaminants and the approximate period of loading.

**Surface and Groundwater Studies from Discharge of Recycled Water, City of San Bernardino Municipal Water Department**

Mr. Wildermuth conducted numerous studies to evaluate receiving water impacts in surface water and groundwater from the City of San Bernardino's recycled water discharge to the Santa Ana River. These studies involved surface and ground water modeling to determine the nitrogen and TDS impacts of various recycled water discharge alternatives on surface water and the groundwater basins that are recharged by those surface waters.

**Surface Water Modeling Studies, City of San Bernardino Municipal Water Department**

Mr. Wildermuth conducted surface water modeling studies to estimate the discharge, TDS, and nitrogen impacts on the Santa Ana River from various recycled water marketing alternatives proposed by the City of San Bernardino.

**Water Use Audit and  
Water Resources  
Development, Rancho  
Mission Viejo**

Mr. Wildermuth conducted a water use audit of Rancho Mission Viejo and developed a phased plan of study for the development of water resources for the Ranch as land is converted from agricultural to urban uses.

**Preparation of  
Application to Divert  
Water, Rancho Mission  
Viejo**

Mr. Wildermuth prepared an application to divert water by appropriation and the supporting environmental documentation. Impacts to downstream water users were evaluated and mitigation plans were developed. Mr. Wildermuth also participated in negotiations for the sale of diverted water to local agencies.

**Evaluation of  
Proposals, URS  
Consultants (for the  
Santa Ana Watershed  
Project Authority)**

Mr. Wildermuth evaluated the impacts of various waste discharge proposals for the Western Riverside Regional recycled water plant on surface and groundwater resources in the upper Santa Ana Basin.

**Saline Plume  
Management  
Alternatives, Kaiser  
Steel Resources**

Mr. Wildermuth developed saline plume

management alternatives in the Chino Basin for Kaiser Steel Resources. This work involved groundwater modeling and water quality sampling. Solutions included pump and treat alternatives and a salt-offset alternative. In addition to developing the salt-offset alternative, Mr. Wildermuth assisted Kaiser in moving this solution through the regulatory process, saving Kaiser over \$40 million.

**Conjunctive Use Plan Study, Western Municipal Water District, San  
Bernardino Municipal Water District, City of San Bernardino, and Orange  
County Water District**

Mr. Wildermuth developed conjunctive use plans for the management of local, imported, and recycled water above Riverside Narrows.

**Montgomery Watson (aka James M. Montgomery, Consulting Engineers  
[JMM]) – 1987 to 1990**

Mr. Wildermuth served as the manager of Water Resources studies at JMM's Irvine office. Mr. Wildermuth was also the manager and lead-modeling specialist for the *TDS and Nitrogen Studies, Upper Santa Ana Watershed*. Responsibilities included the development of a comprehensive work plan and the modification, calibration, and use of the Santa Ana Basin Planning models to evaluate future TDS and nitrogen management plans. Mr. Wildermuth developed a series of models to simulate the fate of agricultural leachates in the vadose zone and the saturated zone for the 1900 through 2015 period and a software link between the river quality model (QUAL2E) and the Basin Planning models. Mr. Wildermuth participated in the development and evaluation of eight management plans.

**Water Quality Management Plan, Western Municipal Water District, San  
Bernardino Municipal Water District, City of San Bernardino, and Orange  
County Water District**

Mr. Wildermuth was the project manager for the development of a water quality management plan for the Colton and Riverside Groundwater Basins. Mr. Wildermuth developed a detailed work plan that focused on moving various water management entities towards consensus on a basin management plan. The study involved the use of groundwater flow and quality models and public participation.

**Groundwater Mining Studies, Southern Nevada Water Management Study**

Mr. Wildermuth was the lead-modeling specialist in the evaluation of the groundwater mining studies of the Rail Road Valley and California Wash Basins in Nevada.

**Integration of Surface and Groundwater Models, Wyoming Attorney General**

Mr. Wildermuth was the lead-modeling specialist for the integration of surface and ground water models of the North Platte River. The purpose of this project was to evaluate the effects of river depletions due to agriculture and to evaluate reservoir management plans.

**Conjunctive use Study, City of Santa Barbara**

Mr. Wildermuth was project manager and lead-modeling specialist for a conjunctive use study for the City of Santa Barbara. Mr. Wildermuth developed conjunctive use alternatives that involved recharging surface water from the Santa Ynez River (by injection and spreading), the injection of recycled water, and in-lieu recharge concepts. Mr. Wildermuth used groundwater models to evaluate the impacts of conjunctive use operations on groundwater.

**Phase IV Groundwater Investigation, Kaiser Steel Resources**

Mr. Wildermuth was the project manager of the Phase IV Groundwater Investigation at the Kaiser Steel Facility in Fontana, California. Mr. Wildermuth's role in this study was to develop remediation plans for two large plumes of degraded groundwater emanating from Kaiser. Mr. Wildermuth directed the study team's efforts, which included water quality sampling, drilling monitoring wells, groundwater modeling and engineering studies.

**QUAL2E Modeling Studies, Santa Ana River Dischargers Association**

Mr. Wildermuth was involved in the review of the QUAL2E modeling studies performed by the Santa Ana Regional Water Quality Control Board. Mr. Wildermuth's responsibility in this study was to provide an independent review on behalf of the Santa Ana River Dischargers Association. The key issue of this study was a determination of QUAL2E model reliability for establishing waste load allocations for point discharges with an emphasis on nitrogen species.

**Camp Dresser & McKee, Inc. – 1980 to 1987**

**700,000 Acre-ft Groundwater Storage Program, Metropolitan Water District of Southern California**

Mr. Wildermuth was the project manager and lead analyst for the 700,000 acre-ft Chino Basin Groundwater Storage Program. Mr. Wildermuth's responsibilities included assisting Metropolitan with the formulation of storage program alternatives, the development and implementation of state-of-the-art models for non-point source groundwater contamination and regional vadose zone modeling, the application of these models to evaluate the groundwater level and water quality impacts from a large groundwater storage program, conducting workshops with stakeholders, and the preparation of the environmental impact report.

**TCE/DBCP Investigation, Santa Ana Watershed Project Authority**

Mr. Wildermuth was the project manager and lead analyst for a TCE/DBCP investigation in the Redlands area. Field studies were designed and implemented to estimate the then current TCE and DBCP conditions in the area, and a three-dimensional model was developed to predict the fate of TCE and DBCP under various management alternatives. Alternative mitigation measures were developed and evaluated.



**Safe Yield and Groundwater Management Study, Cucamonga County Water District**

Mr. Wildermuth was the project manager and lead analyst for a safe yield and groundwater management study for the Cucamonga Groundwater Basin. Mr. Wildermuth developed and calibrated a three-dimensional groundwater model to evaluate the impacts of artificial recharge, in-lieu recharge, and drought management programs. Mr. Wildermuth developed a detailed monthly hydrology of the Cucamonga Basin for use in safe yield estimates, groundwater model calibration, and water supply management.

**Chino Basin Storage Program Feasibility Study, Department of Water Resources**

Mr. Wildermuth was a project engineer for the Chino Basin Storage Program feasibility study. Responsibilities included an evaluation of the availability of surplus State Project water for conjunctive use and an evaluation of the correlation between local flood flows and surplus state project water.

**Groundwater Modeling Study, Regional Water Quality Control Board**

Mr. Wildermuth was a project engineer for the Santa Ana Regional Board groundwater modeling study of the 400,000-acre Upper Santa Ana Groundwater Basin.

Responsibilities included a complete rewrite and calibration of the groundwater hydraulic and water quality codes. These models were used to investigate revisions to the Upper Santa Ana Basin Plan.

**Water Flow and Demand Projection Study, City of Scottsdale**

Mr. Wildermuth was a project engineer for a water demand and recycled water flow projection study for the City of Scottsdale. Various potential land use scenarios were analyzed to develop ultimate water demands and recycled water flows. Potential supplies included Central Arizona Project water, groundwater, and recycled water. Mr. Wildermuth developed a comprehensive and fully interactive computer model to conduct the analysis. The unit factors for indoor and outdoor water demand and the parameters defining waste flow were estimated by calibrating the computer model in a selected area of Scottsdale.

**Groundwater Study, Occidental Chemical**

Mr. Wildermuth was a project engineer for a detailed groundwater study of a toxic spill site near Lathrop, California for Occidental Chemical. This study involved the use of a two-dimensional, multi-layer groundwater model to predict pollutant movement with and without mitigation plans.

**Shallow Groundwater Management Program, The Irvine Company**

Mr. Wildermuth was the project manager for a study to develop a shallow groundwater management program for the Irvine Subbasin. This study resulted in a recommendation to control and/or mitigate shallow groundwater in an urbanized area.

**Phase II Irvine Subbasin Study, The Irvine Company**

Mr. Wildermuth was the project manager for the Phase II Irvine Subbasin study. This study focused on the development and analysis of water use plans for the Irvine Subbasin.

**Flood Control Study, The Irvine Company**

Mr. Wildermuth was the project manager and lead analyst for a flood control study of San Diego Creek in the City of Irvine. This study analyzed flood plain development and channel improvement alternatives.

**Flood Control Planning Study, Army Corps of Engineers**

Mr. Wildermuth was a project engineer for the flood control planning studies in support of the Central Arizona Water Control Study. Mr. Wildermuth performed the hydraulic design and cost estimates for reservoir flood outlets and levee systems on the Salt River and selected bridges on the Salt River. The impacts of sand and gravel operations within the Salt River were also evaluated.

Mr. Wildermuth also conducted numerous river-engineering studies in Southern California for the Army Corps of Engineers.

**TetraTech - 1976 to 1980**

**HEC-1, HEC-2, & TR-20, Florida and Texas**

Mr. Wildermuth was the project engineer for numerous flood insurance studies in Florida and Texas, specializing in the use of HEC-1, HEC-2, and TR-20. And, Mr. Wildermuth applied special-purpose dam flood wave routing models and the HEC-6 model for the hydrologic evaluation of flood safety for a nuclear power plant.

**Los Angeles County Flood Control Department - 1974 to 1976**

**Studies for the Storm Drain System of the Laguna Regulating Basin**

Mr. Wildermuth conducted design hydrology and hydraulic studies for a storm drain system and collaborated in a PMF spillway adequacy study for the Laguna Regulating Basin. This study included the development of runoff model parameters and the conceptual development of a serial reservoir flood routing computer model. Mr. Wildermuth also developed a semi-self-calibrating watershed model.

This conceptual model was used by the Hydraulic and Hydrology section for spillway studies in the late 1970s and early 1980s.

**Affiliations / Organizations**

American Water Resources Association

National Groundwater Association

Groundwater Resources Association

*Steve C. Cortner  
Land Use Consulting  
12890 Fremont Street  
Yucaipa, CA 92399*

## **BIOGRAPHY**

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### **STEVE C. CORTNER**

#### **Experience**

Steve C. Cortner has 39 years experience in the mining, asphalt and ready mix concrete industry. Proven ability to negotiate and develop Site Plan approvals and Reclamation Plans. Extensive skills in the regulatory environment dealing in land use issues, public affairs and environmental regulation. Mr. Cortner has extensive experience in California legislative procedures and is instrumental in political leadership planning and development. As the President of the California Mining Association ("CMA") from 2002-2006, he reviewed and addressed all California mining related regulatory and legislative issues at the State Capitol level. The past 21 years Mr. Cortner has significant experience in CEQA litigation and product liability lawsuits. Additionally, Mr. Cortner has a strong background in planning, design, development, and construction oversight of aggregate, asphaltic concrete and ready mix production facilities. Mr. Cortner has served as an expert witness and given expert testimony on various mining related issues. As part of his overall consulting services, Mr. Cortner has conducted market analyses throughout California, North Dakota and the State of Washington.

#### **Education**

Associates of Arts Degree, San Bernardino Valley College 1974  
Bachelors of Science Degree, California State College San Bernardino 1978

#### **Licenses**

California State General Engineering Contractor "A" License  
Registered Environmental Assessor (REA) Non Active

#### **Affiliations**

President-California Mining Association (CMA), 2002-2006  
Board of Directors-CMA, 2000-2006  
Executive Committee-CMA, 2000-2006  
Executive Committee-California Materials Association of California (CMAC) 2001-2005  
Board of Directors-CMAC, 2001-2005  
Board of Directors-City of Azusa Chamber of Commerce, 2000-2005  
Board of Directors-Fund California Mining and Mineral Museum, 2004-2007  
Board of Directors-Southern California Rock Products Association, 1993-1995  
Executive Committee-Southern California Ready Mix Concrete Ass. 1993-1995

*Steve C. Cortner*  
*Land Use Consulting*  
*12890 Fremont Street*  
*Yucaipa, CA 92399*

## **Professional Experience**

**2006-Present** Steve Cortner Land Use Consulting, Principal  
**1999-2006** Vulcan Materials Company, Western Division, Vice President-Resource and Development-California, Arizona and New Mexico  
**1996-1999** Calmat Co, District Manager, Los Angeles, San Bernardino, Riverside and Orange Counties  
**1995-1996** Oderbrecht of California, supervision and oversight of the construction of the rock processing facility for the supply of construction materials for the U.S.A.C.O.E., Seven Oaks Dam Project  
**1992-1995** CEMEX USA, Vice President, Property & Regulatory Affairs  
**1986-1992** C. L. Pharris Sand & Gravel, Inc., Vice President Property & Regulatory Affairs  
**1988-1992** Lytle Creek Land & Resources, Vice President Property  
**1972-1986** Livingston-Graham, Redlands CA, Plant Manager



*Steve C. Cortner*  
*Land Use Consultant*

**STATEMENT OF QUALIFICATIONS**

Steve Cortner has 39 years experience in the mining, asphalt and ready mix concrete industry. Proven ability to develop Site Plan approvals and Reclamation Plans. Extensive skills in the regulatory environment dealing in land use issues, public affairs and environmental law. Extensive experience in California legislative procedures and instrumental in political leadership planning. Mr. Cortner has significant experience in CEQA litigation, product liability, and mine related personal injury issues. Strong background in planning, design, development, and construction oversight of aggregate and ready mix production facilities.

From November 2005 to current, Mr. Cortner has owned and operated Steve Cortner, Land Use Consulting, providing consulting in the development, permitting and regulatory areas of mining and other land use development throughout California and Washington. As part of his overall consulting services, Mr. Cortner has conducted market analyses throughout California, North Dakota and the state of Washington. In addition to Land Use Consulting Mr. Cortner has worked with numerous law firms as their expert witness on mining, mine and safety standards and other mining related issues.

Selected Achievements:

- Successful in persuading Alameda County that an existing mine site was vested and needed no further land use entitlements to construct a new processing facility to replace the existing facility. Further argued that additional mining property that existed required no further mining permits only a Reclamation Plan.
- Instrumental in negotiating a pre-annexation agreement on an 80 acre, 1500 ton per hour processing facility and mining property resulting in terms and mitigation measures that saved the company millions of dollars.
- Key role in successfully packaging a \$100 million sale of company to a large foreign company.
- Successful negotiations with the Federal Government on eminent domain action on several hundred acres of mining property resulting in an agreement that allowed the mining of property where endangered plant species existed without further mitigation.
- Settlement of lawsuit filed for termination of its lease on mining property resulting in the continuation of use of leased property (e.g., continued mining under favorable conditions).
- Oversight of design, development and construction of a 1,500 ton per hour rock and sand plant facility.
- Co-authored assembly bill reforming the California Endangered Species Act resulting in more favorable conditions for land use operators when dealing with endangered plant species on private property.
- Oversight of construction of a 3,000 ton per hour rock plant specifically built to provide material to construct the Seven Oaks Dam.
- Management responsibility for 440 acre expansion of aggregate operation in Sanger-Centerville, Ca.
- Conducted an extensive market study and aggregate demand analyses for the expansion of the San Bernardino County, Mid Valley Landfill.
- Successfully negotiated with the Port of Tacoma the purchase acquisition of the largest permitted gravel site in Thurston County, Washington.

Select clients:

- Rimrock CA LLC
- RNP-C LLC
- Lytle Development Joint Venture Company
- Diepenbrock / Harrison Law Firm
- Vulcan Materials Company
- Brown & Caldwell
- Aspen Environmental Group
- Hi-Line Construction, Inc.
- First Industrial Realty Trust, Inc.
- Amador Ranch Associates, LLC
- EnviroMINE, Inc.
- West Coast Environmental and Engineering, Inc.
- Sespe, Inc.
- County of San Bernardino, Department of Public Works, Solid Waste Management Division
- Orco Block Company
- Buada & Associates
- Running Luck Ranch
- Wait & Colfer, Expert Witness in Advanced Gunitite, Inc. v. Syndex, Inc.
- Internal Revenue Service, Expert Witness in Chapman Glen Limited v. Commission
- Gresham Savage, Expert Witness Pacific Clay Products v Wyroc
- Frick Pickett & McDonald LLP, Expert Witness FENB v Premier Golf Properties
- Tenner Johnson, Kennedy LB Crushing v Kennedy Hills
- Flesher Broomand McKague LLP UP v Sumlin

Previous Employment Experience:

Vice President-Resources for Vulcan Materials Company, Western Division responsible primarily for the State of California, however, giving oversight to territories of Arizona and New Mexico. Responsibilities included, but not limited to, leadership in overall divisional direction, directly responsible for property and permit acquisition, heading the environmental department, department head for the community relations department and legislative affairs including, however, not limited to the coordination and procurement of new and modified permits at a local, state and federal level.

Previous experience included P&L responsibilities for the four southern counties of California for CalMat Co. Responsibilities include the heading of all sales, operations, environmental, safety, accounts receivables and resource management.

As Vice President-Property for CEMEX USA primarily responsible for all land use and environmental issues, lobbying and trade association member leadership, regulatory affairs and negotiating all land use issues and property acquisitions. Responsibilities included management of the health and safety department, environmental department, the processing of permits and entitlements and oversight of corporate litigation.

As Vice President of C.L. Pharris Sand & Gravel, Inc., responsibilities included permit acquisition on all land use issues, negotiating with land use agencies to acquire site plan approvals and reclamation plans. Required to review and approve all CEQA documents with direct oversight of outside consultants on all land use issues. Additional responsibilities included assistance and oversight of corporate litigation dealing with personal injury and product liability, land use and environmental matters. This position

additionally included oversight of our workers compensation program, safety policy, guidelines and procedure including the interface with corporate insurance providers for personal injury and product liability. Additionally planning of the development of mine sites and due diligence of mine site acquisitions.

During this time I was also Vice President of Property for Lytle Creek Land and Resources with primary responsibilities to oversee planning, CEQA documents, environmental reports and all other land issues. Included in these responsibilities were review and oversight of all outside consulting firms bid proposals, budgets and planning time goals. Extensive negotiations with regulatory agencies.

Prior employment was primarily in the operational areas of mining and construction materials production and its ancillary products and workplace safety.

Education:

California State University (CSUSB) – Bachelors of Arts Degree, Business Administration, Business Management

San Bernardino Valley College – Associate of Arts Degree

Licenses:

General Engineering Contractor A License

Registered Environmental Assessor (REA), In-Active

Affiliations:

President – California Mining Association (CMA) 2002-2006

Board of Directors – Fund California Mining and Mineral Museum 2004-2009

Board of Directors– City of Azusa Chamber of Commerce 2001-2005

Board of Directors – California Materials Association of California 2000-2005

Board of Directors – Southern California Rock Products Association 1993-1995

Other Businesses:

J&S Stream Reclamation Management CA LLC, General Partner

Maytown Sand & Gravel LLC, Member-General Partner

Pacific Northwest Strategies LLC, Member-General Partner