

EXHIBIT "A"

CURRICULUM VITAE

OF

N. THOMAS SHEAHAN

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Groundwater Resources
Groundwater Flow Studies
Water Rights Investigations
Water Supply Development
Well Design and Construction
Water Well Hydraulics Studies
Remedial Investigation Studies
Hydrogeochemical Assessments
Litigation Support and Expert Services

EDUCATION

J.D., Law, University of La Verne, College of Law, La Verne, CA, 1978
Certificate in Advanced Groundwater Hydrology, Massachusetts Institute of Technology,
Cambridge, MA, 1967
Post-graduate Courses, Groundwater Hydrology, University of Arizona, Tucson, AZ 1961
B.S., Geology and Geography, University of Missouri, Kansas City, MO 1960

REGISTRATION

Professional Geologist, CA No. 682, 1970
Registered Geologist, OR No. 288, 1978
Certified Engineering Geologist, CA No. 307, 1970
Certified Engineering Geologist, OR No. E288, 1978
Registered Geophysicist, CA No. 757, 1974
Certified Hydrogeologist, CA No. 119, 1995
Certified Professional Geologist, AIPG No. 2481, 1970
Licensed Attorney, State Bar of CA No. 86443, 1979

PROFESSIONAL HISTORY

Geomatrix Consultants, Inc., Corona, CA, V.P. & Principal Hydrogeologist, 2002 – Present
Dames & Moore (URS Corp.), Covina, City of Ontario, and Rancho Cucamonga, CA, V.P. &
Principal Hydrogeologist, 1990 – 2002
Geraghty & Miller, Inc., City of Industry, CA, V.P. & Senior Hydrogeologist, 1986 – 1990
Woodward-Clyde Consultants, Inc., Santa Ana, CA, Chief Hydrogeologist, 1984 – 1986
Brown and Caldwell Consulting Engineers, Pasadena, CA, Chief Geologist, 1972 – 1984
Layne Northern Company, Lansing, MI, Senior Groundwater Geologist, 1969 – 1972
Layne and Bowler, Inc., Memphis, TN, Research Groundwater Geologist, 1965 – 1969
Woodward, Clyde, Sherard & Associates, Kansas City, MO, Engineering Geologist, 1962 – 1965
U.S. Army Corps of Engineers, Ballistic Missile Office, Kansas City, MO, and Tucson, AZ,
Engineering Geologist, 1960 – 1962
U.S. Navy Reserve, Memphis, TN, Lt. J.G., Special Duty Intelligence Officer, 1965 – 1968
U.S. Air Force Reserve, Missouri Air National Guard (MOANG), St. Joseph, MO, and Arizona Air
National Guard (AZANG), Tucson, AZ, A/1C, Air Photo Intelligence Specialist, 1956 – 1962

SKILLS AND EXPERIENCE

Mr. Sheahan is vice president and principal hydrogeologist for Geomatrix Consultants, Inc., and manages the Corona, California, office for the firm. He provides consultation to clients on a wide variety of matters involving geology, hydrogeology, environmental, and water resources issues, including water rights litigation, groundwater development, well design and construction, water systems assessments, and water classification studies.

He has more than 45 years of experience in geology, hydrogeology, geophysics, soil testing, groundwater flow, computer modeling, soil and groundwater remediation, groundwater supply evaluation, and well hydraulics. As principal hydrogeologist, he serves as senior consultant to a variety of municipal, industrial, and agency clients, and their counsel, on projects involving geology, soils, hydrogeology, water supply, geochemistry, and groundwater contamination. His experience includes spring water assessment studies, hydrogeologic evaluations, and financial allocation of sites located within federal Superfund areas. He has conducted studies involving the characterization and computer modeling of groundwater flow and chemical transport of contaminated groundwater, fault studies, expert witness and litigation support services, and a variety of consulting services involving local, state, and federal governmental agencies.

Mr. Sheahan provides litigation support to attorneys in a wide variety of water rights and environmental matters. He serves as expert witness in his areas of specialization, and assists in evaluating technical issues consistent with legal strategies. Mr. Sheahan has been qualified as an expert in geology and groundwater in state superior courts and in federal court. He has served as Court Appointed Expert in Los Angeles County Superior Court. He is experienced in preparation of declarations and expert reports, including reports meeting the requirements of the Federal Rules of Evidence.

In addition, Mr. Sheahan assists clients and their attorneys in financial allocation of costs among potentially responsible party (PRP) groups. He has developed computer-based models and allocation programs for this purpose, as well as other technically based financial allocation methods for submittal to regulators and PRPs. Mr. Sheahan is also effective at assisting clients in pursuing site/project approval matters through various administrative processes.

Since 1972, Mr. Sheahan has concentrated his practice on groundwater projects principally in the western United States, although past project locations have ranged from as far east as the Bahamas to as far west as Guam and Okinawa. He has conducted seminars in hydrogeology, expert testimony, technical writing, oral communications, and other aspects of professional consulting. He has been active in professional societies and instrumental in creating training programs for groundwater professionals. He has served as guest lecturer in hydrogeology at the university level, and as faculty at California State University, Fullerton, California, teaching graduate-level classes in hydrogeology.

REPRESENTATIVE PROJECTS

The following are representative projects conducted by Mr. Sheahan, grouped according to the following six general categories of professional service and experience:

- litigation support and expert witness services,
- water resources and hydrogeologic services,
- well hydraulics and well design services,
- environmental contamination and assessment services,
- engineering geology and geotechnical services, and
- military experience.

LITIGATION SUPPORT AND EXPERT WITNESS SERVICES

Pre-Litigation Support, Water Rights Issues, Hatch & Parent, for Nestle Waters North America (Arrowhead), Southern California. Provided expert consultation concerning the issue of whether or not groundwater developed for bottling purposes at a spring site is percolating groundwater, in accordance with *Los Angeles v. Pomeroy*, or water flowing in a subterranean stream subject to California Water Code §1200. Assisted counsel during meetings with other interested parties.

Expert Witness Services, Farella, Braun and Martel, San Francisco, CA. Designated as expert witness hydrogeologist for spring water bottling company, defendant in a class-action suit alleging, in part, that the sources used for spring water bottling did not meet the 1995 FDA Identity Rules. Performed independent evaluations of multiple sources in Northern/Southern California, reviewed reports by other consultants and public agencies, and assessed the history and nature of the sources. Prepared an expert report for trial presenting opinions and bases for opinions. This matter settled favorably to defendant prior to going to trial.

Expert Witness Services, Dongell Lawrence Finney LLP, for Whittaker Corporation, Southern California. Provided expert reports and expert testimony concerning amounts and costs for replacement water, impacts of contamination on water-supply wells, water well siting, and likelihood of sources of groundwater contamination in vicinity of site near Santa Clarita, California. Assisted counsel during depositions of opposing experts.

Court-Appointed Technical Expert, Superior Court of Los Angeles County, Los Angeles, CA. Served as Court-Appointed Expert to review technical cases presented by four parties to litigation concerning remediation of a contaminated property in Southern California. Assessed reports prepared by multiple consultants, county agencies, and state regulators to advise the court on the occurrence of contamination and remediation of the site. Prepared a detailed expert report presenting the results of the assessment for incorporation into the court record. The matter was settled at trial.

Litigation Support and Expert Witness Services, Hanna & Morton, Los Angeles, CA. Engaged by attorney for United Technologies Corporation to provide litigation support and expert witness services for its lawsuit against a degreaser manufacturer. Conducted independent investigations of the site,

determined causes of soil and groundwater contamination, calculated time of contamination, used modeling techniques to demonstrate capture of the contaminated groundwater by the remediation system, and prepared multiple expert reports regarding various aspects of the matter. Appeared for several depositions, assisted client counsel during depositions of opposing experts, and provided expert testimony in court.

Litigation Support and Expert Witness Services, Kirkpatrick & Lockhart, Pittsburgh, PA. Served as expert witness and litigation support consultant to outside counsel regarding various cost recovery litigation matters for United Technologies Corporation at sites in the City of Industry, California, Collierville, Tennessee, and West Palm Beach, Florida. Reviewed reports and documents prepared by others to develop a detailed understanding of site conditions. Prepared multiple expert reports and was deposed multiple times. Reviewed expert reports prepared by opposing experts, provided technical assessment of discrepancies in opposing reports, and assisted counsel during depositions of opposing experts. Testified in federal court on matters covered by expert report.

Multi-Site Cost-Recovery Litigation, Heller Ehrman White & McAuliffe, for Atlantic Richfield Company, Los Angeles, CA. Provided litigation-support services to a major oil company, through their attorneys, on cases seeking cost recovery from insurance companies for environmental damages. Services provided included: document identification, acquisition, indexing and review; consultation with attorneys in case planning and issue identification; aerial-photo interpretation; time-of-occurrence calculations; and estimating time and cost of groundwater cleanup. Managed multiple technical teams; provided site-specific consultation; assisted at depositions of opposing experts; and prepared graphic evidence exhibits. This matter settled prior to trial.

Risk Assessments, Loeb & Loeb, for Phaostron, Azusa, CA. As Principal-in-Charge, assisted the attorney for an industrial client with a facility located within the San Gabriel Valley Superfund site in assessing and minimizing liability. Conducted a series of risk assessments, using existing data that allowed a recommendation of No Further Action to the Los Angeles Regional Water Quality Control Board. Prepared a detailed, computer-based financial allocation program for 19 PRPs based on existing site-related data, which was used by counsel in negotiations of a settlement in this matter.

Litigation Support, McCutchen Doyle Brown & Enersen, for Intel Corporation, Palo Alto, CA. As expert witness and litigation consultant, assisted counsel in preparing computer-based flow-and-transport models of multi-party Superfund site for use in financial allocation among PRPs. Prepared separate remedial investigation/feasibility study (RI/FS) for Intel site, and conducted "fingerprinting" assessments of chemical contaminants to show sources of groundwater contamination.

Expert Testimony, Clifford & Brown, Antelope Valley Water Rights Litigation, Antelope Valley, CA. Provided expert testimony for Phase I trial in superior court regarding selection of area for use in later adjudication proceedings. Reviewed report by opposing expert and provided opinions on areas of disagreement. Work involved designation of watershed areas, assessment of underlying geologic materials, and incorporation of previously adjudicated area boundaries. Assisted counsel during settlement negotiations, assessed "Empirical Yield" of valley area, and made independent assessment of groundwater resource availability.

Financial Allocation, Rodi-Pollock, for Trinova Corporation, Glendale, CA. Principal-in-Charge and expert witness in Superfund litigation. Prepared assessment of sources of groundwater contamination in the Glendale Superfund area, for presentation to a Technical Review Panel regarding allocation of responsibility for remediation costs. Work involved computer-based flow-and-transport modeling, GIS analyses, presentations to Technical Review Panel, review and assessment of other PRPs' reports, presentations, and other technical submittals, and advice to counsel during proceedings.

WATER RESOURCES AND HYDROGEOLOGIC SERVICES

Water Supply Studies, Intergen North America, Palm Springs, CA. Principal-in-Charge and Project Manager. As part of this energy company's Application for Certification, assisted in documenting the water supplies available for use at a proposed power plant. Studies included evaluation of groundwater supplies available, reclaimed water sources, potential for groundwater recharge, hydrogeochemistry, and analytical modeling to assess impacts of groundwater development. Provided consultation to client and outside counsel concerning interaction with the California Energy Commission, water rights issues, and coordination with local water agencies.

Groundwater Conjunctive Use Study, Verdugo Basin, Crescenta Valley Water District, Los Angeles County, CA. Principal-in-Charge. Managed a basin hydrogeologic evaluation and feasibility study for groundwater storage and artificial recharge. Project included development of a basin conceptual model and MODFLOW groundwater flow model for use in making recharge scenario evaluations. Worked closely with Technical Advisory Committee throughout the project. Project was funded by Department of Water Resources under AB 303, and was selected in 2004 as the highlight project for the AB 303 annual report.

Groundwater Model Development, Carollo Engineers for Victor Valley Water District, Victorville, CA. Principal-in-Charge. Managed the development of a MODFLOW groundwater flow model designed to be used for evaluation of flow of groundwater following artificial recharge with State Project water from the California Aqueduct, and the effects on groundwater storage and recovery of the recharged water through a well-installation program. Project included development of a conceptual hydrogeologic model and evaluation of long-term storage capacity, groundwater underflow, and basin yield.

Hydrogeologic and Spring Impact Studies, Three Mountain Power, Burney, CA. Principal-in-Charge and Project Manager. Working through the outside counsel for a major energy company, provided hydrogeologic assessment of groundwater resources available to meet the needs of a new power plant. Evaluated aquifer characteristics to allow assessment of potential impacts of groundwater production at the new facility. Evaluated isotope studies to determine the sources of groundwater recharge to the area, and developed water budgets for current and projected future conditions to assess potential impacts. Conducted a supplementary hydrogeologic investigation of the potential impact of groundwater pumping at the proposed facility on springs in the vicinity, including the historic Burney Spring. Testified before California Energy Commission members at a public hearing, providing opinions, and bases for opinions, concerning the potential impacts of the proposed facility.

High Groundwater/Liquefaction Potential, San Bernardino Valley Municipal Water District, San Bernardino, CA. Principal-in-Charge. Assisted the water district in assessment, characterization, and evaluation of aquifer conditions causing high groundwater and liquefaction potential in critical areas of the District. Consulted with the High-Groundwater Committee to determine program elements for addressing the problems, and provided review of work being done by others in the area that might impact the overall program. Designed pilot wells for use in controlling high groundwater, removing high-total dissolved solids shallow water and management of discharge water quality for discharge to the Santa Ana River.

Aquifer Storage and Recovery Pilot Test, Metropolitan Water District of Southern California, Hayfield Valley, CA. Principal-in-Charge and Project Manager. Prepared a detailed program for conducting recharge pilot testing in the Cholla Wash area of Hayfield Valley to determine the effectiveness of recharging up to 32,000 acre-feet per year of surplus surface water from the Colorado River Aqueduct. The program called for assessment of subsurface aquifer characteristics using geophysical investigations and test drilling, installation of monitoring wells for evaluation of subsurface flow of recharged water, assessment of liquefaction potential, and monitoring of groundwater uplift on the aqueduct. Program included a field investigation plan, which described the geophysical and test-drilling activities, and a facilities modification plan, which described recommended changes to the conceptual design of recharge facilities. A detailed pilot test plan was also prepared, which described the methods for conducting the recharge test, monitoring, data evaluation, and assessment of the long-term recharge potential of Cholla Wash.

Aquifer Storage and Retrieval Studies, Catellus Corporation, Los Angeles, CA. Served as principal hydrogeologist on a series of projects addressing the potential for storing surplus surface water underground in desert areas of Southern California. Evaluated precipitation, evapotranspiration, runoff, and groundwater recharge of multiple desert groundwater basins. Interpreted geologic, lithologic, and borehole geophysical data and conducted surface geophysics studies using Time-domain Electromagnetic Method (TDEM) technology. This work involved consideration of potential benefits to both the client, a large landholder, and the Metropolitan Water District of Southern California.

Spring Water Evaluation/Documentation, Nestlé Waters North America (formerly Perrier Group of America), Ontario, CA. Principal-in-Charge and Project Manager. Documented and developed spring water sources under the 1995 FDA Identity Rules for a major spring water bottling client. This work involved interpretation of state and federal regulations and guidelines, assessment of the hydraulic connection of spring water harvesting facilities, geochemical studies, and conceptual design of collection, transport, and loading facilities. In this work, Mr. Sheahan interacted with the client's in-house and outside counsel, the client's spring resource managers, and state and federal regulatory agencies. Studies included characterization of springs and associated extraction facilities, evaluations of geochemical data for comparison of waters, testing for hydraulic connection between facilities, and preparation of reports for submittal to state and federal agencies and others. Prepared conceptual designs for spring water collection facilities, pipelines, and loading stations and assessed the appropriate means for development of spring sources. Assisted in meetings with regulatory agencies concerning approval of sources as springs in accordance with the state and federal regulations.

Conjunctive-Use Study, City of Santa Cruz, CA. Project Manager. Conducted a conjunctive-use study of the lower San Lorenzo River Groundwater Basin to develop additional groundwater supplies for municipal use through recharge and underground storage of surplus surface water. Analyses of aquifer-test data indicated that extraction from wells could induce infiltration of surface water from the San Lorenzo River that would otherwise be lost to the ocean. Alternative projects included off-stream and in-stream percolation facilities, river diversion structures, and additional well fields for extracting groundwater and controlling infiltration and groundwater storage.

Water Studies, City of Morro Bay, CA. Project Manager. Performed a series of studies for the water-short community of Morro Bay to aid in short-term and intermediate-term improvements to the municipal water supply. Assessed the subsurface outflow in the Torro Creek area and performed test drilling and aquifer testing. The results of these studies disclosed substantial groundwater being lost to the ocean. Assisted the City in filing a water-rights application to appropriate unused water, and developed programs for well-field installation to induce infiltration of surface water. Evaluated potential recharge sites to augment availability of groundwater. Designed and implemented well rehabilitation and water treatment systems for wells with high manganese concentrations.

Groundwater Basin Management Plan, San Luis Obispo County, Los Osos, CA. Project Manager. Prepared a Groundwater Basin Management Plan for the Los Osos-Baywood Park area of San Luis Obispo County. Included an evaluation of safe yield and recommendations for resource development. Also prepared a Water Quality Management Plan for this area that included an evaluation of water quality impacts from on-site wastewater disposal systems, and provided solutions to the high-nitrate problem in the aquifer systems.

EIR Review, Tulare County, Visalia, CA. Principal-in-Charge and Project Manager. Served as technical consultant to the Tulare County Resource Management Agency in reviewing environmental impact reports and related documents regarding a proposed rock, sand, and gravel mining operation. The focus of review activities was on the hydrogeologic, water quality, and groundwater-modeling efforts required. These services included preparation of technical memoranda of review, interacting with County staff and consultants to the applicant, and presentations to the Tulare County Board of Supervisors concerning the hydrogeologic aspects of the proposed project.

Groundwater Recharge Assessment, Water Replenishment District of Southern California, Palos Verdes, CA. Principal-in-Charge and Project Manager. Conducted a series of studies for the Water Replenishment District to assess the potential for providing groundwater recharge to the West Coast Groundwater Basin. The focus of the studies was on an existing gravel pit formerly used for rock, sand, and gravel mining. The studies involved drilling and testing of groundwater aquifer characteristics, geochemical analyses of groundwater, assessment of impacts from an associated inert landfill, fault studies, and computer modeling of the potential recharge program. In addition, an assessment was made of the potential for, and feasibility of, using various water sources as recharge water. Sources included storm water runoff, reclaimed water, and surplus Colorado River water from the Metropolitan Water District.

WELL HYDRAULICS AND WELL DESIGN SERVICES

Well Design/Construction, *Wildflower Energy Company, Palm Springs, CA*. Principal-in-Charge and Project Manager. Designed and constructed a deep well/pump system for groundwater production to meet the needs of the newly constructed power plant. Water system included instrumentation and controls for off-site monitoring, and a hydropneumatic tank for balancing water pressures in the plant system. Performed analytical modeling of the groundwater basin to assess impacts of pumping on other wells in the area, and assisted the client in obtaining approval of the plant from the California Energy Commission.

Well and Pipeline Design, *San Bernardino Valley Municipal Water District, San Bernardino, CA*. Principal-in-Charge. The District's goal was to install two 1,600-gallon-per-minute (gpm), 400-foot-deep production wells and conveyance facilities that would extract a variable mixture of water from two separate aquifers and convey it to an existing water supply pipeline in the area. The keys to the mixture were (1) to maximize extraction from the shallow, high-TDS aquifer to provide lowering of high-groundwater conditions in the area, (2) maintain a TDS level in the discharged water below 700 mg/L, and (3) maintain a flow rate of 1,600 gpm. A detailed review of aquifer conditions and physical conditions in the area was performed as part of the siting studies. Performance criteria were developed for the wells, the pumps, and the down-hole mixing and control systems, and pipeline alignments were identified for each of the two wells. Throughout the process, Geomatrix and the District worked with a committee of local water agencies to develop the design for the most economical and constructible facilities. Prepared design drawings and specifications for the wells, pumps, down-hole flow-control system, and pipelines; assisted the District in evaluating contractor bids; and provided construction observation services.

Documentation of Adequacy of Well Seal, *Mountain View Well MV-#3, City of Loma Linda, CA*. Principal-in-Charge and Project Manager. Conducted a study for the City involving getting an operational permit from the California Department of Health Services (DHS) for Well MV-#3. This well had been constructed by another consultant, and experienced problems during installation of the sanitary seal. Because of the problems, DHS had refused to permit the well for potable water supply. The scope of work included evaluating the existing, available data and information from reports prepared by other consultants concerning the construction and operation of Well MV-#3, looking for and documenting evidence regarding the adequacy of the seal in Well MV-#3. The data and information were used to provide documentation of evidence in support of the proposition that the well is adequately sealed to meet the requirements of the DHS for an operating permit. Based on the review of the data and information concerning the construction and operation of Well MV-#3, demonstrated to DHS that the documents reviewed were sufficient to allow an independent evaluation of the adequacy of the seal in Well MV-#3 and that the annular grout seal in Well MV-#3 meets the intent and the requirements of the State of California for this well, is an effective barrier to migration of contaminants from shallower aquifers, and is, therefore, an adequate seal that meets the DHS requirements for an operating permit. As a result of this work, DHS granted the City an operating permit for Well MV-#3 with no further modifications required.

Well Assessment, *Southern California Water Company, Los Angeles, CA*. Principal-in-Charge. As principal hydrogeologist, evaluated the life expectancy of the client's water wells, assessed the relative

efficiency of numerous wells, determined well-rehabilitation needs and effectiveness, and developed a plan for well maintenance. The overall assessment program was computerized into a Well Optimization Program, including a database of well data and programs for determining when to repair/rehabilitate/replace wells and pumps.

Well Field Investigation, City of Seattle, WA. Principal-In-Charge and Project Manager. Conducted an investigation of the Cedar River Groundwater Basin for development of a 90-mgd well field. Studies of the 250-foot-thick aquifer system included geophysical investigations with refraction and reflection seismic methods, electrical resistivity profiling, test drilling, aquifer testing, and hydrogeochemical analyses. The work addressed water-rights issues, hydrologic budget, well-field design criteria, project cost estimates, and a proposed implementation program.

Aquifer Evaluation, City of Santa Barbara, CA. Project Manager. Performed aquifer evaluation and computer flow modeling of the Santa Barbara Groundwater Basin. Developed a finite-difference model for use in evaluating the potential for seawater intrusion under various pumping scenarios. Designed improvements to the municipal groundwater supply system including two new wells, pumps, piping, and a water treatment plant for removal of iron and manganese.

Groundwater Well Supply Design, City of Othello, WA. Project Manager. Designed and constructed a deep, multi-zone, basalt groundwater supply well and performed testing and evaluation of other city wells and pumps. Recommended and implemented well rehabilitation to improve well efficiency and increase production.

Groundwater Supply Well Review, City of Mountain View, CA. Project Manager. Provided assistance in reviewing operational history of a large groundwater supply well to determine the optimum means for rehabilitation. Provided an assessment of the nature and causes of reduced production and efficiency, and for sand pumping conditions, screen corrosion, and encrustation of well/pump components. Prepared specifications for implementation of a rehabilitation program to return the well and pump to optimum performance.

Seawater Intrusion Barrier Design, Santa Clara County Water District San Jose, CA. Project Manager. Conducted extensive groundwater basin and aquifer evaluation studies to define the criteria for design and installation of an injection-extraction barrier to restrict sea water intrusion. Provided expert witness services to the Santa Clara County Water District in eminent-domain proceedings. District was successful in acquiring property for construction of a saltwater intrusion barrier.

ENVIRONMENTAL CONTAMINATION AND ASSESSMENT SERVICES

Superfund Site Investigation, Aeroquip Corporation, Burbank, CA. Principal-in-Charge and Project Manager. Provided consultation to an aerospace manufacturing company concerning its site in the San Fernando Superfund area. Evaluated soil-matrix, soil-vapor, and groundwater conditions and prepared an assessment of the site supporting the opinion that the site activities had not contributed to groundwater contamination in the area. Assisted the client and outside counsel in cost-allocation proceedings with other PRPs to an acceptable resolution.

Superfund Site Data Interpretation, Stainless Steel Products, San Fernando Valley, CA. Principal-in-Charge and Project Manager. At a metals-forming facility located in the Burbank Operable Unit

of the North Hollywood National Priorities List site (Superfund), provided site and soil-groundwater contamination characterization in a politically and geologically complex environment. Evaluated groundwater chemical data to define the off-site sources of contamination beneath the site. Prepared computer-animated-video of the site hydrogeologic characteristics for communicating with state and federal regulatory agencies, other PRPs, and special interest groups, and assisted in resolving financial allocation issues.

Remedial Investigation/Feasibility Study, Intel Corporation, Mountain View, CA. Principal-in-Charge and Project Manager. Prepared an extensive remedial investigation and feasibility study at the Middlefield-Ellis Superfund site. Prepared a computer-based cost-allocation system for financial allocation of capital costs, operating costs, and maintenance costs among 52 sources from multiple potentially responsible parties.

Remedial Action Plan, Space Ordnance Systems, Canyon Country, CA. Project Manager. Conducted a site investigation and prepared a remedial action plan for clean up of trichloroethene-contaminated soil and groundwater at two pyrotechnics manufacturing facilities. Remediation included an injection-drain groundwater barrier, extraction wells, granular-activated-carbon treatment facilities, percolation ponds, and soil excavation and disposal plans. Provided expert witness services to the client's attorneys in defending against environmental suits.

Groundwater Monitoring, Basalt Waste Isolation Project, Richland, WA. Project Manager. Devised a groundwater monitoring strategy for the Basalt Waste Isolation Project, a geologic repository for radioactive waste. Provided direction to other consultants in modeling of long-term contaminant transport of groundwater containing radioactive waste.

Groundwater Investigation, Lockheed Corporation, Redlands, CA. Project Manager. Investigated groundwater conditions in the Crafton-Redlands area, San Bernardino County, California, including evaluation of sources of dibromochloropropane and trichloroethene in the Bunker Hill Groundwater Basin. Performed inverse contaminant-transport modeling of alternative scenarios to assess likely locations of initial contamination. Results of this study allowed regulators to focus state Superfund activities on the more-likely sites, and to eliminate other suspected areas from further concern.

Geochemical Investigation, Clark County Sanitation District, Las Vegas, NV. Project Manager. Conducted geochemical investigations of shallow aquifers to evaluate infiltration conditions of an existing sanitary wastewater collection system for the purpose of providing input to the design of flow-system modifications. Measured changes in inorganic chemistry at multiple locations within the collection system and correlated increases in sulfate and other compounds with shallow groundwater chemistry to delineate the portions of the collection system with infiltrating groundwater.

Groundwater Investigation, Clark County Sanitation District, Mount Charleston, NV. Project Manager. Prepared a groundwater investigation and waste-management plan involving flow in fractured rock, movement of contaminants in the vadose zone, and fate and transport of soluble waste materials from septic tanks and leach fields in this mountain community. Provided recommendations for managing wastewater to improve groundwater quality.

BTEX Evaluation, American Honda Motor Company, Torrance, CA. Principal-in-Charge and Project Manager. Performed various hydrogeologic/geochemical assessments of the groundwater

beneath the Honda facility. Identified the off-site source of the contamination and assisted the client in avoiding liability for cleanup.

Remedial Investigation/Feasibility Study, Intel Corporation, San Francisco, CA. Principal-in-Charge and Project Manager. Provided consulting services to attorneys representing a major semiconductor manufacturer in the San Francisco Bay Area, in connection with the Middlefield-Ellis-Whisman Superfund (MEWS) site. Studies included evaluation of organic solvent contaminants in soil and groundwater and delineation of contaminant plumes in a complex hydrogeologic environment. Performed computer modeling, water quality assessments, soil borings, monitor well construction, and aquifer testing, and developed other site information.

ENGINEERING GEOLOGY AND GEOTECHNICAL SERVICES

Dewatering Assessment, Walt Disney Imagineering, Burbank, CA. Principal-in-Charge and Project Manager. Performed a series of assessments of an ongoing dewatering operation at the site of a new, multi-story building to determine if discharge water could be safely recharged to the groundwater basin. Studies included MODFLOW modeling of the groundwater basin in the vicinity of the site. Results of studies showed that recharge was technically feasible and would save considerable cost being incurred due to surface water disposal fees.

Titan II Missile Project, U.S. Army Corps of Engineers, Tucson, AZ. Project Engineering Geologist. Served as engineering geologist for the Titan II Missile Project, which involved assessing deep-hole construction in fractured rock, developing groundwater supplies, and constructing underground facilities. Mapped bedrock geology in missile silos during construction to provide documentation for use in defending against construction claims. Provided construction quality assurance for engineered fill emplacement and other construction activities.

Site Evaluation, Southern California Edison, El Centro, CA. Project Manager. Evaluated multiple sites in Imperial County, California, to select an optimum location for a proposed geothermal waste disposal site. Geophysical surveys, test drilling, and monitoring well construction were employed, along with geologic mapping, to establish the database needed for site evaluation. Site selection criteria were defined, and each site was rigorously evaluated against the criteria to provide a site-ranking matrix from which the optimum site could be selected.

Trenching and Soil Dating, Los Angeles County Department of Public Works, Sylmar, CA. Project Manager. As part of a team of engineering geologists and soil scientists, conducted trenching at the site of a planned water filtration plant to evaluate fault characteristics. Mapped geologic structures in the trenches, identified fault traces, and assisted in age-dating the faults. The results of the study showed that the faults were Holocene in age, and this information was further considered in evaluating the risks for construction of the water treatment facility.

Soils and Foundation Studies, Various Clients, Kansas City, MO. Project Engineering Geologist. As part of a team of engineering geologists and soil scientists, conducted trenching at the site of a planned water filtration plant to evaluate fault characteristics. Mapped geologic structures in the trenches, identified fault traces, and assisted in age-dating the faults. The results of the study showed that the faults were Holocene in age, and this information was further considered in evaluating the risks for construction of the water treatment facility.

Soils and Foundation Studies, Various Clients, Kansas City, Missouri. As project engineering geologist, performed soil and rock drilling, coring, and sampling for geotechnical evaluation purposes. Described soils in the field using the Unified Soil Classification System, and preserved samples for laboratory testing. As laboratory technician, conducted multiple tests of soil and rock samples including unconfined compression, Atterberg limits, consolidometer, triaxial compression, Procter, dry density, and moisture content tests.

MILITARY EXPERIENCE

United States Air Force: Assignments: MOANG, AZANG, USAFR
 Rank: Airman First Class, USAFR
 SN / Designation: AF27540863 / 20650-Intelligence Specialist
 Service Dates: 1956 - 1962

Enlisted in the United States Air Force, Reserve (USAFR) program, in December 1956 and completed training as Air Photo Intelligence Specialist, Air Operations Intelligence Specialist, and Air Photo Interpretation Specialist. Assigned to 180th Tactical Reconnaissance Squadron Photo Jet (180th TRS PJ), Missouri Air National Guard (MOANG), St. Joseph, Missouri, 1956-1960, as Air Photo Interpretation Specialist. Performed initial interpretation of vertical and oblique air photos from "wet" negatives to provide immediate information for intelligence planning. Performed stereoscopic and photogrammetric evaluations of air photos taken from RF84F reconnaissance aircraft; calculated sizes, dimensions, and details of facilities and surface features; identified military equipment types; calculated rates of vehicular movement; evaluated photogeology of soil and rock conditions; and mapped vegetation in investigation areas. Prepared photo-mosaics and constructed annotated stereograms of target areas.

Selected for special service assignment with U.S. Army, 82nd and 101st Airborne Divisions, for Pine-Cone-II, Ft. Bragg, North Carolina, 1958. Temporary transfer to Pope Air Force Base, 464th Troop Carrier Wing, C-119 Flying Boxcars, to serve as liaison to 82nd and 101st Airborne Divisions as Air Photo Intelligence Specialist during Pine-Cone II War Games against U.S. Army Rangers, summer 1958.

Transferred to Arizona in 1960 as engineering geologist with the U.S. Army Corps of Engineers (civilian employee) assigned to the Titan II Ballistic Missile Construction Office, Tucson, Arizona. Served with USAFR and Arizona Air National Guard (AZANG), Tucson, Arizona, as Air Operations Intelligence Specialist with 152nd Tactical Fighter Squadron (152nd TFS), 162nd Tactical Fighter Group (162nd TFG), 1960-1962, providing Air-Ops-Intel support to 152nd TFS for deployment and pilot training operations with F100A fighter aircraft. Transferred to USAFR center, Kansas City, Missouri, 1962, and served as Operations Intelligence Specialist.

Completed six-year military obligation and was honorably discharged from the USAFR on December 27, 1962.

United States Navy: Assignment: USNR - RIP, MEMPHIS, TN
 Rank: Lieutenant J.G., USNR - RIP
 SN / Designation: 693053 / 1635-Special Duty, Intelligence
 Service Dates: 1965 - 1968

Commissioned as officer in the United States Navy Reserve (USNR), Reserve Intelligence Program (RIP), on March 29, 1965, at Washington D.C., by Paul H. Nitze, Secretary of the Navy, on behalf of President Lyndon B. Johnson. Assigned as Special Duty Intelligence Officer to Reserve Intelligence Command Unit (now USN Naval Reserve Intelligence Area 8), Memphis, Tennessee, associated with the USN Naval Air Station, Millington. Served as RIP Intelligence-Analyst 1965-1968 on team of officers conducting geologic, geographic, geopolitical, military, target, and beach analyses during Viet Nam conflict.

Promoted to Lieutenant J.G. in 1967. Prepared and submitted Intelligence Summary documents to Office of Naval Intelligence (ONI) and others concerning analyses of various specific sites and geopolitical areas for use in support of ONI worldwide planning and operations, and conducted special assignments as directed.

Continued to serve and occupy billet as USN/RIP Special Duty Intelligence Officer, until honorably discharged from the USNR on February 28, 1968.

AFFILIATIONS

Association of Engineering Geologists
American Institute of Professional Geologists
National Ground Water Association, Past Director Technical Division
California Groundwater Association, Past Director at Large
Groundwater Resources Association
Inland Geological Society
California State Bar Association
American Bar Association

PUBLICATIONS AND PRESENTATIONS

Following are a few, representative articles authored or coauthored by Mr. Sheahan and published in various recognized, refereed, technical, or legal journals.

“Managing Basin-Wide Groundwater Quality Changes Resulting from Enhanced Groundwater Recharge Programs.” N.T. Sheahan , W.G. Hamer, and D.E. Gould. Professional paper presented at the Groundwater Quality 2004 International Conference, University of Waterloo, Department of Earth Sciences, Waterloo, Ontario, Canada, July 19-22, 2004.

“After the Pala/Pauma Decision: Criteria for Classifying Groundwater as Subterranean Streams or Percolating Groundwater.” N.T. Sheahan. *California Water Law & Policy Reporter*, v. 13, no. 5. February 2003.

“Optimizing Water Well Productivity and Operating Costs.” N.T. Sheahan and J. Minneci. *WATER/Engineering & Management*, Scranton Gillette Communications, Inc. May 1996.

“The Environmental Consultant: A Toolbox for the Attorney.” N.T. Sheahan. *The Professional Geologist*, American Institute of Professional Geologists, v. 30, no. 10. September 1993.

“Developing Spring Water Under the Proposed FDA Rules.” N.T. Sheahan and J.G. Zukin. *The Professional Geologist*, American Institute of Professional Geologists, v. 30, no. 8. July 1993.

“Trenching and Soil Dating of Holocene Faulting for a Water Filtration Plant Site, Sylmar, California.” H.R. Spellman, N.T. Sheahan, R.J. Shlemon, J.R. Stellar, and S.H. Mayeda. *Bulletin of the Association of Engineering Geologists*, v. XXI, no. 1. February 1984.

“Devising a Groundwater Monitoring Strategy for a Geologic Repository for Radioactive Waste.” N.T. Sheahan, L.S. Leonhart, F.A. DeLuca, and L.M. West. *Ground Water Monitoring Review*, Technical Division, National Ground Water Association. 1982.

“Legal Liability Associated with Reclamation.” N.T. Sheahan. *Proceedings, Ground Water Pollution and the U.S. Judiciary System, Fifth National Groundwater Quality Symposium*, U.S. Environmental Protection Agency. *Ground Water*, Journal Technical Division, National Ground Water Association. 1980.

“Injection/Extraction Well System -- A Unique Seawater-Intrusion Barrier.” N.T. Sheahan. *Proceedings, Third National Groundwater Quality Symposium*, U.S. Environmental Protection Agency. *Ground Water*, Journal Technical Division, National Ground Water Association. 1976.

“The Value of Hole Caliper in Groundwater Exploration and Well Construction.” N.T. Sheahan. American Water Works Association, *Proceedings of Annual Meeting, Michigan Section*. 1972.

“Type-Curve Solution of Step-Drawdown Test.” N.T. Sheahan. *Ground Water*, Journal Technical Division, National Ground Water Association. 1971.

“A Non-Graphical Method of Determining u and $W(u)$.” N.T. Sheahan. *Ground Water*, Journal Technical Division, National Ground Water Association. 1967.

“Determining Transmissibility from Cyclic Discharge.” N.T. Sheahan. *Ground Water*, Journal Technical Division, National Ground Water Association. 1966.