



PROFESSIONAL PROFILE



Anthony C. Ward, PG

Vice President/Principal Geologist

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EDUCATION

BA, Geology, Occidental College,
Los Angeles, California, 1981

PROFESSIONAL LICENSES

Project Management

Certification, University of

California Los Angeles, 2007

EXPERIENCE SUMMARY

Anthony (Tony) Ward is a California Professional Geologist with over 40 years of experience in the environmental and water-supply fields, serving in technical, client leadership, and management roles. His experience ranges from groundwater resource development in large basins, soil and groundwater contamination characterization and remediation of diverse and complex industrial facilities, high-level agency negotiations regarding complex matters, property redevelopment, assessment of prospective school properties, and landfill characterizations, closures, and redevelopment. Tony's diverse and extensive experience in applied hydrogeology, along with his many years of experience in advocating and negotiating positions on behalf of the regulated community, have been applied in directing the performance of projects and services including CERCLA PRP strategy development, Preliminary Endangerment Assessments (PEAs), Removal Action Workplan (RAW) and Remedial Action Plan (RAP) development and implementation, Remedial Investigation/Feasibility Study (RI/FS) services, and as project coordinator/PRP group common consultant; RCRA Part B Permit preparation, closure and post-closure plan development and RCRA Corrective Action planning, negotiating, implementation, and common consultant to responsible party groups; environmental due diligence for mergers and acquisitions; global compliance audit programs; landfill studies, remediation, closure and redevelopment; California Environmental Quality Act (CEQA) and public participation support; California School Property Evaluation and Cleanup; and expert witness and litigation support. As a Director Emeritus of the Groundwater Resources Association of California (GRA), which he co-founded in 1992, Tony is very familiar with evolving groundwater and environmental issues faced by the regulated community.

TECHNICAL SPECIALTIES

Soil and groundwater contamination characterization and cleanup; Regulatory negotiations (Federal, State, Local); Comprehensive Environmental Response Compensation and Liability Act (CERCLA)/Superfund potentially responsible party (PRP) strategy development and support; Resource Conservation and Recovery Act (RCRA) Corrective Action; Landfill and illegal disposal site assessment, closure and redevelopment; Contaminated site portfolio management; Brownfields redevelopment; Insurance claim technical analysis and underwriting support; Closed and illegal landfill assessment, remediation, agency engagement and redevelopment; Mergers and acquisitions due diligence; Litigation support; Applied hydrogeology; and Groundwater exploration and resource development in large basins.

REPRESENTATIVE PROJECTS

- **State Superfund Landfill Site, RI/FS/RAP/RDIP Concurrent with Site Redevelopment, Southern California.** Principal-in-charge for completing an expedited RI/FS/RAP/RDIP/RA/RACR at a portion of a DTSC-lead 80-acre inactive Class III landfill, which was an Operating Unit (OU) to a much larger adjoining landfill State Superfund site. The site was concurrently undergoing an Environmental Impact Report (EIR) and entitlements for redevelopment. The development is the Porsche Experience Center. Also served as principal technical and regulatory strategist to complete the project, and as one of the primary coordinators of communications among the site owner, Porsche's management and design teams, the City, the EIR consultant, DTSC and other involved agencies. Remedy approval and initial site development activities began in late 2012. Remedial construction was completed in 2016 and Porsche is successfully operating the new facility.



- **State Superfund Landfill Site, Environmental Support During Entitlements Phase, Southern California.** Presently serving as the Principal-in-Charge and supporting the entitlement phase of a planned, world-class recreational and lifestyle P3 development on a substantial portion of a 180-acre, closed Class III landfill. Responsible for all environmental agency engagement, permitting, negotiation and approvals; coordination with the client's development team (civil, geotechnical, architectural, structural, construction) to assure that remedy design elements (landfill cover system, landfill gas collection and treatment and groundwater monitoring and containment) are integrated into other site development needs; and maintain an aggressive schedule for this very complex project. The entitlements phase and EIR are expected to be completed in late 2020 when the construction phase is expected to begin.
- **Federal Superfund Site, Environmental Support During Entitlements Phase, Southern California.** Presently serving as the Principal-in-Charge and providing all environmental support during the entitlements phase for the industrial redevelopment of a substantial portion of a nearly 40-acre NPL site. As part of the overall services, assisting the client with engagement and environmental design negotiations with USEPA (and USACOE), the PRP Group (and consultant team), DTSC and other stakeholders. Also assisting the client, in conjunction with outside environmental counsel, with entering into agreements to provide further CERCLA liability protection. The site features engineered RCRA-equivalent caps; gas collection systems; leachate collection systems and groundwater and vapor monitoring systems. It also has extensive environmental restriction covenants. Presenting the conceptual environmental designs and strategies for placing a 200,000 sq. ft building on a portion of the remediation systems without incurring liability. Construction is expected to begin later in 2020.
- **State Superfund Landfill Site, Environmental Due Diligence, Carson, California.** Principal-in-Charge for environmental due diligence on behalf of a buyer/developer of a 157-acre inactive Class II landfill state Superfund site. Once completed, it is anticipated that the planned development will include over two million square feet of retail, lifestyle, hospitality, entertainment, and residential components. Property was also a candidate NFL stadium site, and during the due diligence period, made a presentation to the NFL regarding environmental remediation considerations for construction of a stadium complex on a landfill. Served as the principal technical and regulatory strategist to present the conditions under which the residential component of the development will be approved by local and state agencies, including California EPA Department of Toxic Substances Control (DTSC). This is the first time in the State of California that DTSC will approve a residential development on top of a Class II landfill. This project also included preparing a request for proposal (RFP) for a "Guaranteed Fixed Price," with insurance contract to implement a DTSC-approved remedial action plan (RAP) for the site, evaluation bidders and selected the most-qualified contractor. The site remediation includes landfill capping, landfill gas collection, and groundwater monitoring and containment. In addition to factoring in geotechnical implications, the effort also included a comprehensive review of environmental conditions at the site, multiple agency meetings, coordination with the full development due diligence team concerning constructability of the project under multiple site plan scenarios.
- **Illegal Disposal Site (Landfill) Assessment, Mitigation Strategy Development and Remediation Planning, Antelope Valley, California.** On behalf of a major financial institution, presently serving as Principal-in-Charge for on-going site assessment and negotiations with sixteen Federal, State, Regional and County agencies, departments, and programs for mitigation of approximately 53,000 cubic yards of predominantly construction and demolition waste, green waste, universal waste, municipal solid waste, and hydrocarbon impacted soils. The Los Angeles County Department of Public Health is LEA for this site. The waste was partially placed into an ephemeral stream. Designed and implemented a site characterization program to assess if hazardous constituents are present and to enable the evaluation and selection of a remedy. Submitted a Focused Feasibility Study that evaluated three alternatives for site remediation and restoration. Recently completed biological studies and outreach to multiple Federal, State, Regional and County agencies about their ongoing involvement/jurisdiction with remedy selection, permitting requirements, and restoration. The planning and permitting phase of the project is presently underway.
- **Illegal Disposal Site (Landfill) Assessment and Initial Agency Engagement, Solano County, California.** On behalf of a major financial institution, presently assisted with initial assessment planning, and County Local Enforcement Agency (LEA) and CalRecycle engagement regarding the potential characterization of construction and demolition waste, green waste, universal waste, municipal solid waste, and lead-impacted soils present on a 38-acre property. The engagement ultimately allowed the client to transfer the property to a party who will develop the property.
- **Illegal Disposal Site (Landfill) Assessment, Cleanup and Closure, Antelope Valley, California.** On behalf of an alternative energy company, assessed and cleaned up an illegal disposal site on a property that was being acquired by the client to develop an alternative energy facility. The disposal site was ordered to be cleaned-up by the Los Angeles County Department of Public Health. Successfully negotiated that while all municipal solid waste was to be removed and disposed; the remaining several

thousand cubic yards of livestock manure was allowed to remain and be reapplied to the property for agricultural purposes.

- **Mergers and Acquisitions/Due Diligence/Audits, Multiple Locations.** Conducted or directed more than 200 Phase I and Phase II ESAs for/through land developers, property owners, law firms, manufacturing companies, global entertainment companies, lending institutions, hospitals, food companies, utility companies, and oil companies. Among the properties assessed were very high-profile entertainment venues in the United States, a candidate site for an NFL stadium, and facilities that designed and manufactured engines for space exploration.
- **Operating Industries, Inc. (OII) Landfill Superfund Site, Feasibility of Groundwater Monitoring System, Los Angeles, California.** Evaluated the feasibility of installing a groundwater monitoring system in bedrock directly beneath the waste prism of this Class II landfill Superfund site. The task included assessment of intrinsically safe methodologies and evaluation of the ability to prevent leachate from migrating from the landfill to the underlying bedrock.
- **San Gabriel Valley Superfund Site, Technical Report for Compliance with Waste Discharge Requirements, Azusa, California.** Directed the preparation of the technical report for compliance with revised California Code of Regulations (CCR) Title 23, Division 3, Chapter 15, Article 5, Waste Discharge Requirements related to groundwater monitoring and reporting for the PRP who owned a Class III disposal facility.
- **Casmalia Resources Superfund Landfill Site, Geologic Characterization, Northern Santa Barbara County, California.** Developed, implemented, and managed the geologic characterization portion of a RCRA Part B Hazardous Waste Permit Application for this former Class I disposal facility. The characterization included a thorough description of all relevant geologic units, surface, and down-hole (rock core) fracture mapping, surface geologic mapping, and surface geophysics.
- **Geologic and Hydrogeologic Investigations of a Candidate Landfill Site, Southern Ventura County, California.** Provided technical direction and overview for geologic and hydrogeologic investigations pertaining to the suitability of proposed Class III disposal facility.
- **Geologic and Hydrogeologic Investigations of a Candidate Landfill Site, Northern San Diego County, California.** Provided technical direction and overview for geologic and hydrogeologic investigations pertaining to the suitability of proposed Class III disposal facility.
- **Insurance Underwriting Technical Support (Landfill).** Assisted an insurance company with analysis of site conditions and remediation requirements in support of underwriting a pollution legal liability policy for a large Class II landfill in Southern California that is presently undergoing concurrent remediation and development for retail, hospitality, lifestyle, and residential use.
- **DTSC Advisory Committee, California School Districts.** During the late 1990s / early 2000s, served in a unique technical leadership role and formally assisted California school districts in efforts to streamline DTSC-approval process of future school sites by serving on the inaugural DTSC Advisory Committee for, at the time, the newly created school program. Participated on several workshop panels that addressed methods for working with the Cal/EPA, and also worked with Coalition for Adequate School Housing (C.A.S.H), the California Department of Education, and the Cal/EPA to develop improvements to Cal/EPA's school site environmental certification program. As the sole environmental consultant member on the DTSC Advisory Committee, was instrumental in negotiating interim guidance for assessing both urban and agricultural sites, and on behalf of C.A.S.H., co-authored some of the technical provisions of A.B. 2644. Some of these provisions included the ability for districts to appeal Cal/EPA determinations on Phase I Environmental Site Assessments (ESAs), broadening the list of environmental assessors to increase competition and lower environmental services costs to districts, and standardizing Phase I ESAs to more closely follow American Society for Testing and Materials' (ASTM) International, and make the preliminary endangerment assessments (PEA) report Cal/EPA review process more efficient. On behalf of C.A.S.H., also helped negotiate with Cal/EPA regarding a template Environmental Oversight Agreement to be used for the environmental investigation of all proposed school sites (that will receive state bond money) in the state and negotiated technical standards to be applied in these investigations. On a related front, also recommended the renaming of the existing document from "Voluntary Cleanup Agreement" to the more appropriate "Environmental Oversight Agreement" and well as changing "Preliminary Endangerment Assessment" report to "Preliminary Environmental Assessment" report. Personal effort is reflected in multiple DTSC fact sheets, advisories, and guidance developed between 2000 and 2004.
- **Motorola 52nd Street Superfund Site, OU3, Phoenix, Arizona.** Project Coordinator for the Operable Unit's respondent group. Responsible for all actions and agency communications by the respondent group under a Settlement Agreement that requires the respondent group to complete a groundwater RI/FS. The primary concern is volatile organic compounds (VOCs).
- **San Gabriel Valley Superfund Site, Negotiation of Technical Strategies, City of Industry, California.** Made presentations to the United States Environmental Protection Agency (USEPA) and

the Los Angeles Regional Water Quality Control Board (LARWQCB) executive officer on behalf of a major manufacturing company related to separation of the client PRP's groundwater contamination plume from plumes emanating from upgradient properties. Assisted the client with technical arguments that were used to appropriately modify USEPA's proposed scope of work from a RI that was proposed for the Operable Unit in which the client PRP's site is located. The primary contaminants are VOCs.

- **Intel Corp. Superfund Site within Middlefield-Ellis-Whisman Superfund Study Area, Multi-Zone Aquifer Test Program, Mountain View, California.** Planned and implemented a comprehensive multi-zone aquifer test program utilizing 140 monitoring wells at this Superfund site. Managed five subcontractors and a field staff of 20 individuals while providing daily updates to the client. The program's results served as a primary basis, during cost allocation negotiations with USEPA and other PRPs, for reducing the client's allocation. The primary contaminants are VOCs.
- **San Gabriel Valley Superfund Site, Characterization of Soil Contamination and Groundwater Contaminant Plume, Southern California.** Characterized soil contamination and a groundwater contaminant plume emanating from a several thousand-gallon release of perchloroethylene (PCE) for a Fortune 100 manufacturing company located in the San Gabriel Valley. Utilized aquifer testing and groundwater modeling to select locations for groundwater extraction wells that were ultimately designed and installed to contain the plume. Directed the application of a multivariate graphical chemical fingerprinting technique which, in conjunction with all other available hydrogeologic data, was used to help demonstrate to the USEPA and the local agency that PCE contamination was limited at the time to the shallowest aquifer beneath the site.
- **San Fernando Valley Superfund Site, Agency Negotiation Strategies, Burbank, California.** Developed agency negotiation strategies that resulted in no further action (NFA) status for a PRP candidate in the San Fernando Valley Superfund Site. The successful strategies drew upon review and presentation of historical facility operations and re-evaluation of existing site investigation data. The primary contaminants are VOCs.
- **San Gabriel Valley Superfund Site, Agency Negotiation Strategies, El Monte, California.** Developed agency negotiation strategies that resulted in no further action (NFA) status for a PRP candidate in the San Gabriel Valley Superfund Site. The successful strategies drew upon review and presentation of historical facility operations and re-evaluation of existing site investigation data. The primary contaminants are VOCs.
- **San Fernando Valley Superfund Site, Regulatory Negotiation, Burbank, California.** Negotiated on behalf of a metal manufacturing client, a complete rescission of threatened civil penalties by the local regulatory agency that was authorized by USEPA to identify PRP candidates for the San Fernando Valley Superfund Site. Beforehand, the client had allegedly failed to comply with directives issued by the local agency to provide appropriate plans and adequately implement a groundwater-monitoring program. The threatened penalties were \$2,500 per day. The primary contaminants are VOCs.
- **State Response Site, Regulatory Negotiation and Technical Strategy, Los Angeles, California.** Served as expert on behalf of the current owner of a property that once included electronic capacitor manufacturing. Polychlorinated Biphenyls (PCB) and chlorinated solvent wastes were disposed onto the property since operations began in the late 1950s. Site characterization indicated that PCB wastes were transported to groundwater by co-mingling with the waste solvents. Between 1999 and 2010, provided technical review of work performed by consultants by the former owner and operator of the site who were conducting the work pursuant to an Imminent and Substantial Determination and Remedial Action Order issued by the DTSC. Also, directed the development of a cost estimate to bring an NFA determination of the site under an unrestricted land use assumption on behalf of the current owner for appeal of the property valuation to Los Angeles County. The county agreed to the appeal which was expected to save the property owner over \$400,000.
- **RCRA Corrective Action Project, San Jose, California.** Serving as common environmental consultant to a generator respondent group that includes approximately 40 companies/entities, for a former RCRA transportation/storage/disposal (TSD) facility that was previously a pesticide storage and blending facility. Responsibilities include providing technical, strategic and administrative support to the group regarding their responsibilities under Corrective Action-related work scopes with the DTSC, and providing oversight of an owner respondent group that is responsible for implementing the work scopes. On behalf of the generator group, prepared an expert opinion concerning attribution of the contamination that is serving as a basis for mediation of remediation cost allocation with the former site owner and current operator of the site.
- **RCRA Corrective Action Project, San Diego, California.** Planned, negotiated, and directed a RCRA Corrective Action project for a 70-year old, 27-acre high-density turbine manufacturing facility. Developed a strategy for streamlining the project at its outset, established an AB 2061 designation with DTSC as lead, and focused additional characterization with a consistent and focused risk-based approach. Directed programs

and resources related to presenting all existing usable data to the involved agencies, completion of the RCRA Facility Investigation (RFI) for soil and groundwater, natural attenuation study, modifications to the periodic groundwater monitoring program, repair of storm water pipelines, bay sediment sampling, soil sampling/disposal for plant improvement projects, development of the baseline risk assessment work plan, phase-separated hydrocarbon recovery, and development of a public participation plan. Six other agencies or governmental bodies have been involved including the DTSC, San Diego Regional Water Quality Control Board (RWQCB), San Diego Port Authority, County of San Diego, City of San Diego, and U.S. Coast Guard.

- **RCRA Corrective Action Project, San Bernardino County, California.** Served as expert and project director on behalf of the former property owner for a RCRA Corrective Action site. When the owner acquired the site in 2003, they were unaware of the RCRA status of the site. According to the DTSC, the site contained multiple areas of concern (AOCs) and solid waste management units (SWMUs) that may have involved oil spills, fireworks manufacturing, explosives storage, a hazardous waste laboratory, and hazardous waste storage. The region within which the site is located is impacted with perchlorate. Worked with previous owner to develop and implement a plan to achieve multiple agency NFA determination so that the property may be sold and redeveloped.
- **RCRA Corrective Action Project, Beaumont, California.** Managed and directed a RCRA Corrective Action project for an electronic parts manufacturing facility. Immediately assisted the client in improving communications with the Cal/EPA and, within 15 weeks, negotiated and resolved all outstanding corrective action issues, resulting in corrective action termination, pending a deed restriction.
- **RCRA Corrective Action Project, Torrance, California.** Planned, negotiated, and directed a complete and fast-track RCRA Corrective Action project for a 67-acre, high-density heavy industrial site. Strategy and negotiation successes resulted in the site receiving an NFA status and immediately being sold for redevelopment. This entire program was completed within 4 years. Previous estimates indicated that the site would require at least 8 years for completion of the RCRA Corrective Action process.
- **RCRA Corrective Action Consent Agreement, Multiple Cities, California.** Developed a successful strategy for establishing a single, streamlined RCRA Corrective Action Consent Agreement for five operating facilities of a major solvent-recycling company. The scope of work for the consent agreement was tailored to meet the unique, individual needs of each facility. At the time that the consent agreement was executed by the Cal/EPA and the client, this was the first time that Cal/EPA had entered into such a unique agreement.
- **RCRA Corrective Action Project, San Jose, California.** Principal consultant and agency negotiator for a forensic evaluation of the applicability of RCRA Corrective Action requirements and record-keeping for a 5,000-acre former rocket engine research/development/test facility in northern California. This effort resulted in successful resolution of the status concerns with the client and agencies involved. Also, served as principal regulatory and technical strategist/negotiator for a final RAP that reduces perchlorate cleanup goals in soil by as much as 50 times the previous goal, and informally adopt a containment zone approach for groundwater, under a joint RCRA Corrective Action and CERCLA program. The strategy incorporated other constituents of concern (COCs), including VOCs, and combined RCRA Post-Closure requirements for various permitted units.
- **RCRA Corrective Action Project, San Fernando Valley, California.** Served as principal-in-charge and contract manager for a phase of investigation and closure of approximately 130 SWMUs at an approximately 3,000-acre rocket engine test site situated near the San Fernando Valley. The project focus was on soil delineation and shallow groundwater contamination above fractured sandstone aquifer, evaluation of human and ecological risks, and interim measures. Contaminants included solvents, petroleum hydrocarbons, metals, perchlorate, and dioxins. Project site was primarily under oversight of DTSC, with additional involvement of USEPA, LARWQCB, and the County of Ventura. Project team activities included planning and budgeting, negotiation with regulatory agencies, work plan preparation, implementation of field programs, development of a site-wide risk assessment approach, unit risk assessments, and public presentations regarding the high-profile site.
- **RCRA Closure Plan, Los Angeles County, California.** Prepared and implemented a RCRA closure plan for 11 hazardous waste management units at a former metal manufacturing facility. Assisted the client in preparing the Cal/EPA for a public hearing on approval of the closure plan. Prepared a draft initial study and negative declaration pursuant to the CEQA, related to the draft RCRA closure plan on behalf of the client and for Cal/EPA.
- **Rapid Assessment of Residential Parcels for Lead in Neighborhoods Surrounding the Former Exide Battery Facility, Southern California.** On behalf of the Los Angeles County Department of Public Health (LACDPH) and under an Incident Command Structure, served as the Unified Commander for the successful planning and execution of the rapid assessment for lead of 500 residential parcels over a two-week period in the communities of Commerce, Maywood and East Los Angeles. Responsible for training and directing a team of

approximately 75 staff members from Roux and Los Angeles County in the assessment of soil and painted building surfaces for lead. This was the largest project of its kind ever undertaken by the LACDPH. The Unified Commander role required team training and direction, technical/operational direction of the 100+ team members, executive and staff-level County communications, media engagement and support, and community/public involvement.

- **Major Uniform and Apparel Company, Environmental Steering Committee Member, United States, Puerto Rico, and Canada.** Served as the sole outside senior technical advisor on the client's internal environmental steering committee. The portfolio of several dozen properties contained predominantly VOCs as the contaminants of concern. Duties involved routine review of priority sites that require environmental cleanup, developing both regulatory and technical strategies that are consistent with the company's overall strategy, and participating in regular presentations to the company's senior leadership team for decisions and direction. Also provided technical support related to the company's environmental due diligence needs for acquisitions and leases, and with some environmental litigation matters.
- **Insurance Claim Analysis, Southern California Properties.** On behalf of an insurance company, providing review of claims related to pollution legal liability policies for multiple properties in Southern California.
- **Proposed New School Sites Assessments, Central and Southern California.** Assisted 10 school districts in southern and central California that were subject to the requirements of A.B. 2644, and related laws, with meeting Cal/EPA requirements for approving future school sites. These activities routinely involved negotiating with the Cal/EPA, implementing Phase I ESAs and PEAs and reporting to school district superintendents, governing board members, planning officials, and the public.
- **Environmental Audits, Site Investigations, and UST Removals, Multiple Cities, California.** Conducted environmental audits, site investigations, and underground storage tank (UST) removals at facilities operated by a worldwide oil-field service company. The assessment included comprehensive site inspections, interviews, regulatory file review, and analysis.
- **Environmental Audits, Site Investigations, and UST Removals, Western Canada and the Northwest Territories.** Conducted environmental audits, site investigations, and UST removals at facilities operated by a worldwide oil-field service company. The assessment included comprehensive site inspections, interviews, regulatory file review, and analysis. Planned and implemented the logistics for drilling and soil/groundwater sampling in tundra,

as well as transporting appropriate drilling equipment by barge along the Mackenzie River in the Northwest Territories.

- **Assessment of Groundwater and Geothermal Resources, Maricopa, Arizona.** Conducted assessment of groundwater and geothermal resources for a proposed community development in the Aqua Fria River and New River basins.
- **Water Well Damage, Pre-Trial Negotiations, Southern California.** Provided expert technical arguments on behalf of a citrus farmer whose 40-year-old water supply well was damaged during well development by a third party. The damage resulted in estimated losses of \$300,000 due to crop loss, well rehabilitation, and development of alternate water supply. Pre-trial negotiations assisted in achieving an acceptable settlement.
- **Groundwater Exploration Program, Northern Nevada US Bureau of Land Management, Northern Humboldt County, Nevada.** Developed, implemented, and managed a groundwater exploration program to supply water to a major agricultural interest.
- **Brine Exploration and Development Program, Northwestern Oklahoma.** Directed an extensive, successful brine exploration and development program for a large salt company. The work included reconnaissance hydrogeologic mapping, brine resource evaluation and evaluation of existing brine wells, design and implementation of a geophysical exploration program, supervision of a drilling and hydraulic testing program on saturated brine conditions, and design of an expanded brine production well field.
- **Groundwater Exploration and Aquifer Storage Feasibility Study, Morro Bay, California.** Designed and supervised a successful groundwater exploration within fractured bedrock. Also evaluated the feasibility of aquifer storage and recovery in local alluvial aquifers.
- **Groundwater Exploration and Development Program, Lassen County, California.** Planned and implemented a successful groundwater exploration and development program that resulted in meeting a peak irrigation demand of 138 million gallons per day that allowed the development of a 12,000-acre alfalfa farm. Through a thorough study of the hydrogeologic setting, development of a hydrologic budget, and groundwater modeling of the groundwater basin in which the farm is located, existing wells were deepened, and new wells were located and completed. This program resulted in an increase of production rates from 500 gallons per minute (gpm) per well to as much as 10,000 gpm per well.
- **Conceptual Drainage Design/Groundwater Exploration and Development Program, Del Norte County, California.** Developed a conceptual drainage design for capture and



management of high-intensity precipitation runoff, and developed and supervised a successful groundwater exploration and development program in fractured bedrock for a proposed nickel and cobalt (laterite) mine.

- **Groundwater Resource Assessment, Southern Baja California, Mexico.** Performed a groundwater resource assessment for a planned residential/resort development.
- **Brine Resource Exploration Program, Central Nevada.** Designed and implemented an extensive brine resource exploration program for a major U.S. mining company within a 400-square mile playa.
- **Assessment of Hydrogeologic Setting and Fluid Leakage, St. Mary Parish, Louisiana.** Assessed the hydrogeologic setting of, and fluid-leakage occurrence within, a salt-dome mineshaft for a large salt company.

- **Groundwater Resource Exploration and Development Program, Southern California.** Developed, implemented, and managed a successful groundwater resource exploration and development program within fractured bedrock for private country clubs.
- **Groundwater Exploration and Aquifer Storage Feasibility Study, Western Riverside County, California.** Conducted a large-scale groundwater exploration and aquifer storage feasibility study for a planned community development.

PROFESSIONAL AFFILIATIONS

Professional Geologist, California – No. 4782

Co-Founder – Groundwater Resources Association of California (GRA) – Director Emeritus, Lifetime Member, Past State Vice President, and Technical Committee Member